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Nutbourne Place Farm
Pulborough

Water Neutrality Statement

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1 Introduction

1.1 This Statement

1.1.1 This Water Neutrality Statement supports the full planning application for the conversion of an existing (former café) building into a three-bedroom agricultural dwelling at Nutbourne Place Farm, Pulborough. It has been commissioned by the Gillen family, owners of the farm (the Applicant).

1.1.2 The Statement sets out how the proposals proactively address the issue of sustainable water use, describing how they respond to the requirement for water neutrality in line with Natural England's Position Statement, subsequent updates and Horsham District advice (see section 1.2).

1.1.3 Specifically, it explains how steps taken to improve water efficiency at the proposed redevelopment will ensure that the proposals will not result in an increase in water use from the public water network. In fact, the measures proposed will effectively reduce water use on site compared to assumed water use for the existing property. The redevelopment will therefore represent a betterment in terms of water use.

1.2 The Issue of Water Neutrality

Natural England's Advice Note regarding Water Neutrality within the Sussex North Water Supply Zone (February 2022 V2)

1.2.1 Natural England's Advice Note expands upon and clarifies information contained within the Interim Position Statement issued in September 2021. It was produced following concerns over the adverse effects of existing groundwater abstraction on the integrity of Arun Valley, specifically Arun Valley Special Conservation Area, Arun Valley Special Protection Area and Arun Valley Ramsar site, and the potential impacts of further development on these areas.

1.2.2 To ensure that new developments do not exacerbate this situation, Natural England has advised that all new development proposals within the Sussex North Water Supply Zone (see Appendix A) must demonstrate water neutrality. Water neutrality is not defined in legislation, but the definition used by Natural England is drawn from the Gatwick Sub Regional Water Cycle Study 2020:

For every new development, total water use in the Sussex North Water Supply Zone after the development must be equal to or less than the total water use in the region before the new development.

1.2.3 The local authorities in the area are working with Natural England to secure water neutrality through a water neutrality strategy. In the interim, Natural England have advised the following approach:

Minimising water use of new builds.

- Complete a water budget (based on occupancy)
- All new builds to demonstrate that they can achieve strict water targets (e.g., 85L/pp/day*)

This can be achieved by measures such as:

- Grey water recycling (advantage of being reliable in hot dry weather);
- Rainwater harvesting;
- Water efficient fixings (such as shower aerators) to demonstrably reduce demand-this would need to be suitably certain.

In addition, water offsetting is required

- One way to achieve this is retrofitting of council owned properties/commercial buildings-located within Sussex North. Examples include:
- Grey water recycling- (for example there are clear opportunities for commercial properties).
- Rainwater harvesting of commercial settings;
- Installation of water reduction fittings in Council-owned buildings.

These measures need to be implemented until such time as a more sustainable water supply has been secured.

It will also need to be ensured that measures are not already proposed (for example in Southern Water's Management Plan) to avoid double-counting.

Any mitigation must be suitably certain in order to comply with the Habitats Regulations and Caselaw.

Water Neutrality in Horsham District (www.horsham.gov.uk)

1.2.4 As a result of the issue identified by Natural England, Horsham District Council now requires applications for developments that fall within the affected area to be accompanied by a statement setting out the strategy for achieving water neutrality, including through significant water efficiency measures and by providing offsetting solutions where required.

1.2.5 The Horsham District Council website includes advice on dealing with the water neutrality issue and this Statement has been designed to align with this.

1.3 Site & Development Description

1.3.1 The proposal is for a change of use from nursery building to a dwelling with nursery restroom, shower room, workshop/store and office.

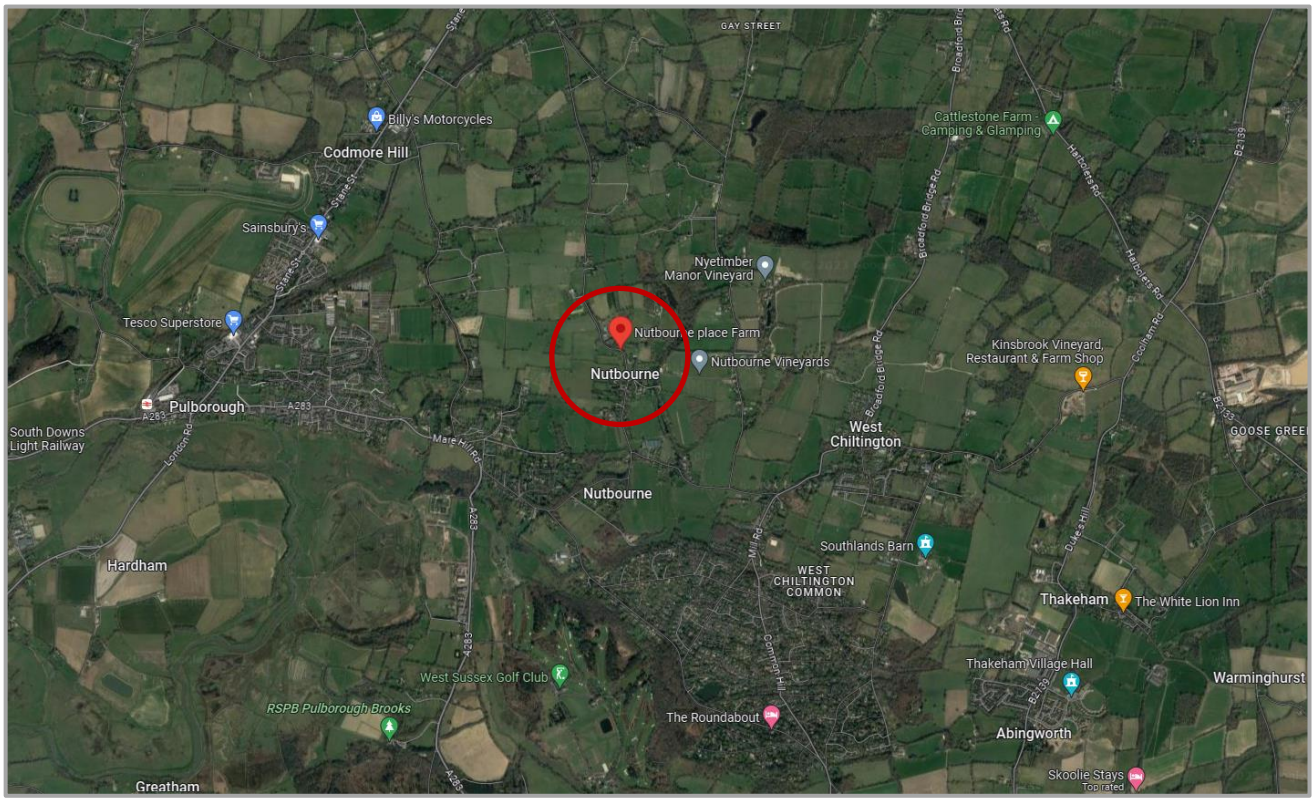


Figure 1: Site location



Figure 2: Existing building to be converted

1.3.2 The existing and proposed plans are provided below, showing the increase in floor area required for the conversion:

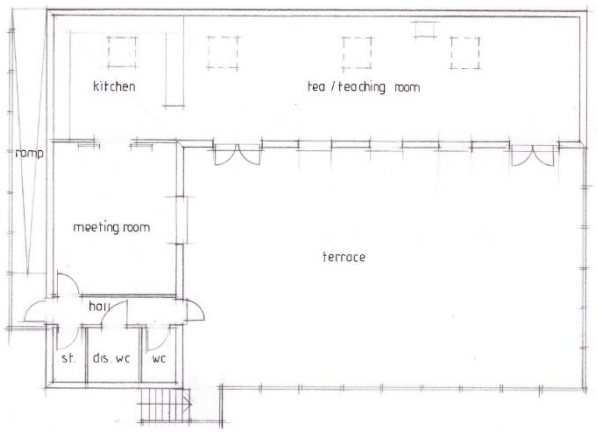
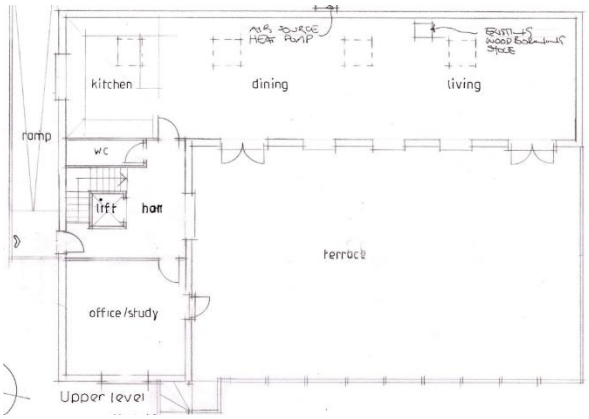
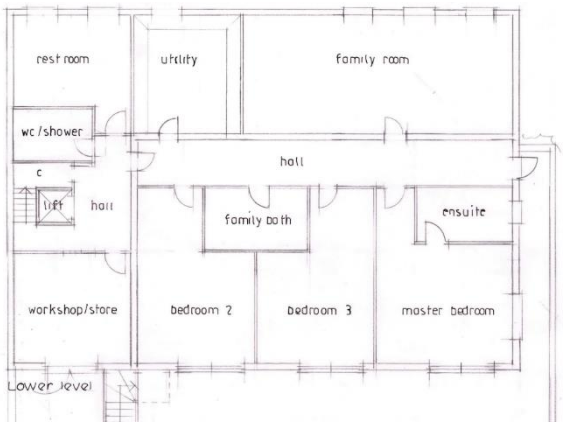
Plans – as existing cafe	Proposed Conversion – upper floor
	
	Proposed Conversion – lower floor
	

Figure 2: Plans (existing and proposed conversion)

1.3.4 The proposed conversion forms part of the overall Nutbourne Place Farm site, which contains two further buildings connected to the public water network, as well as the existing farm operations, via a single water meter. These buildings are identified below:

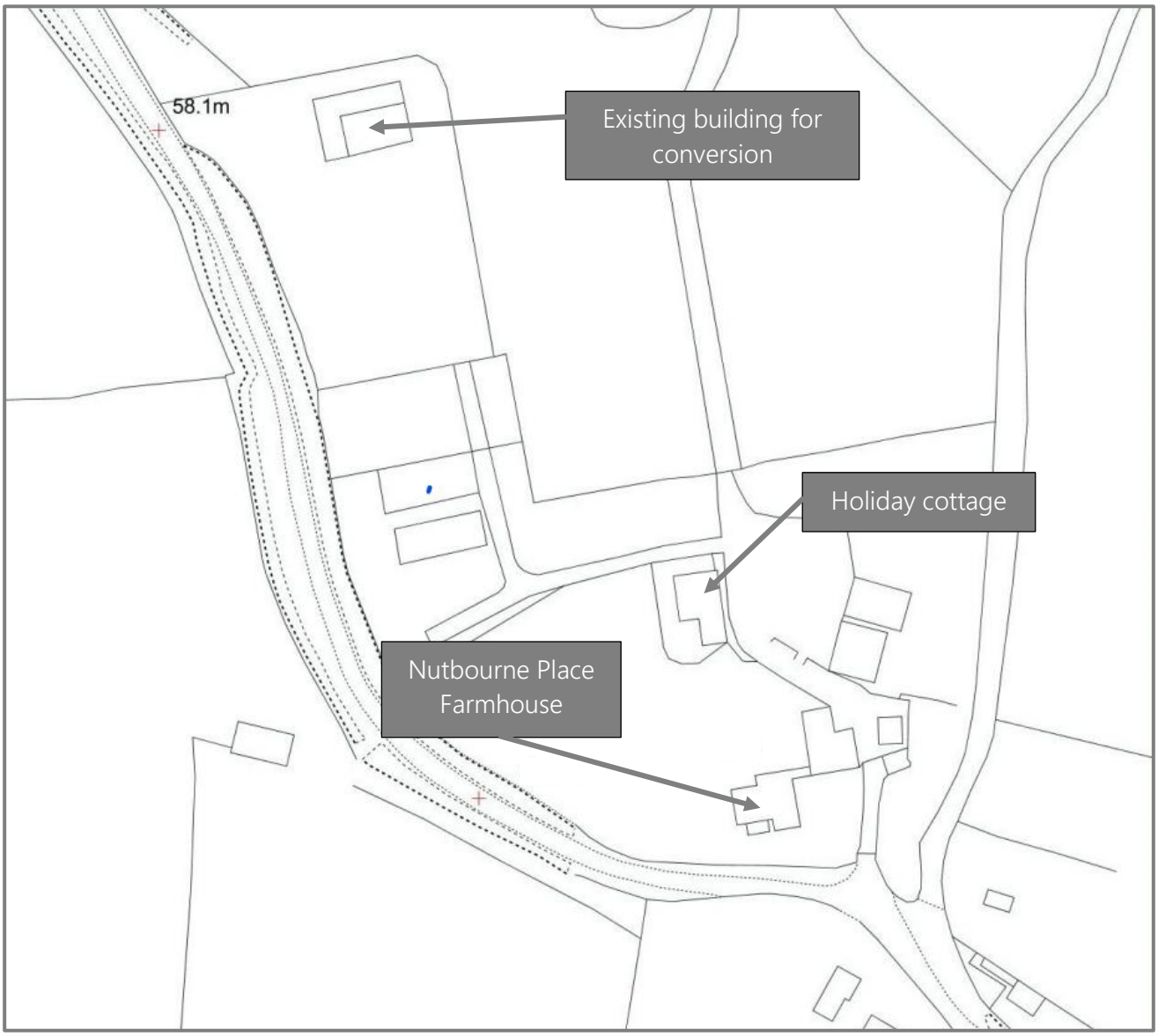


Figure 3: Nutbourne Place Farm – current buildings layout



Figure 4: Nutbourne Place Farm – existing activities and buildings

1.3.5 The water meter therefore serves four locations:

- A – Nutbourne Place Farmhouse
- B – Holiday Cottage
- C – Former Café (to be converted; not been operational for 12 months)
- D – the agricultural growing activity for the site, which is also served by rainwater harvesting

1.3.6 In addition to the public water meter, the site also has an internal water meter. This has been installed in collaboration with Southern Water, and is used to calculate the amount of water that is not returned to the sewer (being used on site for growing) – and therefore a commensurate reduction in water bills for the Applicant.

2 Achieving Water Neutrality

2.1 Baseline Calculations

Water Metering

2.1.1 In undertaking the background evidence collection at Nutbourne Farm, the Southern Water meter has been found to be broken, and we are therefore unable to establish – using such evidence – the overall water use on the farm for a representative 12 month period. The meter is being replaced, but data from it will not be available – and crucially it will not include the café, which has now ceased operation.

2.1.2 However, the internal water meter used by Southern Water to determine the amount of water used for agricultural purposes, is fully functional. This has shown that over 519 days since the meter was installed, 107m^3 of water from the mains has been used for agriculture (Location D). This is the equivalent of 206l/day, or 75,250l per annum.



Figure 5: Internal water meter (reading 107m^3, date taken 02/09/23)

2.1.3 For the remaining locations, we have therefore had to take an alternative approach to water demand calculations using the Part G Water Calculator. In order to do this, detailed water measurements have been undertaken by the applicant of every fixture and fitting within the farmhouse (Location A) and the holiday cottage (Location B). For clarity, we have assumed no existing water use for location C – the café – as it has not been operational for 12 months.

2.1.4 Photographs of all the existing appliance are provided in the Appendix, for information, and a summary of the measurements are provided here:

Farm				Cottage		
DW1	1.25	Unknown / default		DW	0.75	Zanussi KID60S17
DW2	0.76	Zanussi ZDLN1511		WM	6.57	Indesit IWC 71252 W UK N
WM	10.8	Bosch ClassiXX 1000 Express		Shower	12	l/min
Shower 1 - main	12	l/min		Kitchen tap	10	l/min
Shower 2 - guest	6.4	l/min		Downstairs toilet tap	10	l/min
Kitchen 1 Tap	18	l/min		En suite tap	16	l/min
Kitchen 2 Tap	20	l/min		Toilet	8	l/flush
Utility 1 Tap	12	l/min		Garage	16	l/min
Utility 2 Tap	30	l/min		Main bathroom tap	10	l/min
Downstairs toilet tap	12	l/min		Bath	227	l
Pom tap	2	l/min				
Ben tap	12	l/min				
Guest tap	2	l/min				
Main bed tap	4	l/min				
Laura tap	12	l/min				
Barn loo tap	12	l/min				
Toilets	8	l/flush				
Pom Bath	247	l				
Laura Bath	247	l				
Ben Bath	385	l				

Table 1: Existing water fixtures and fittings

A - The Farmhouse

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)	8.00	4.42	0.00	35.36
WC (dual flush)	Full flush Volume (litres)		1.46	0.00	0
	Part flush Volume (litres)		2.96	0.00	0
WC (multiple fittings)	Average effective flushing Volume (litres)		4.42	0.00	0
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	21.00	1.58	1.58	34.76
Bath (where shower also present)	Capacity to overflow(litres)	293.00	0.11	0.00	32.23
Shower (where bath also present)	Flow Rate(litres / minute)	9.20	4.37	0.00	40.20
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)	19.00	0.44	10.36	18.72
Washing Machine	(Litres/kg dry load)	10.80	2.1	0.00	22.68
Dishwasher	(Litres/place setting)	1.01	3.6	0.00	3.62
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)			187.57
	(6)	Contribution from greywater (litres/person/day)			0
	(7)	Contribution from rainwater (litres/person/day)			0
	(8)	Normalisation factor			0.91
	(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)			170.69
	(10)	External water use			5.0
	(11)	Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)			175.7

Table 2: Farmhouse existing water use

2.1.5 On this basis, with daily per person water use at 175.7l, and with the current occupancy of the farmhouse at 2 people, the total daily water consumption is calculated to be 351l/day.

B - Holiday Cottage

2.1.6 The information / calculations for the cottage are provided for completeness only – under Part G it would achieve a usage figure of 154.8l per person per day.

2.1.7 However, as a holiday cottage the occupancy throughout the year varies considerably, and it is therefore very difficult to provide a robust figure on existing water use over a 12-month period. For this reason, and as will be seen below – this property is not included as part of the Offsetting solution proposed. It is assumed that the water use for the cottage will be the same both pre and post conversion, and therefore has no bearing on the water neutrality calculation.

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)	8.00	4.42	0.00	35.36
WC (dual flush)	Full flush Volume (litres)		1.46	0.00	0
	Part flush Volume (litres)		2.96	0.00	0
WC (multiple fittings)	Average effective flushing Volume (litres)		4.42	0.00	0
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	12.00	1.58	1.58	20.54
Bath (where shower also present)	Capacity to overflow(litres)	227.00	0.11	0.00	24.97
Shower (where bath also present)	Flow Rate(litres / minute)	12.00	4.37	0.00	52.44
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)	10.00	0.44	10.36	14.76
Washing Machine	(Litres/kg dry load)	6.57	2.1	0.00	13.80
Dishwasher	(Litres/place setting)	0.75	3.6	0.00	2.70
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)			164.57
	(6)	Contribution from greywater (litres/person/day)			0
	(7)	Contribution from rainwater (litres/person/day)			0
	(8)	Normalisation factor			0.91
	(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)			149.76
	(10)	External water use			5.0
	(11)	Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)			154.8

Table 3: Holiday cottage existing water use

In Summary

2.1.8 The total calculated existing water use for the site is therefore summarised as follows:

	Occupancy Rate	Water Consumption	Total Water Consumption (litres/annum)
A	2	175.7 (litres/person/day)	128,261
B	variable	154.8 (litres/person/day)	Excluded – neutral impact
C	N/A	0	0
D	N/A	206 (average l/day)	75,250
		TOTAL	203,511

Table 4: Nutbourne Place Farm Baseline Water Use

2.1.9 To achieve water neutrality in line with Natural England and Horsham District requirements, the water use for the overall site (excluding the holiday cottage which has a neutral impact) once the conversion has taken place cannot exceed the figure of 203,511 litres.

2.2 Proposal Demand – Converted Dwelling

Domestic Water Reduction Measures

2.2.1 The Natural England Position Statement advises a domestic water consumption target of 85 litres per person per day (l/p/d) for this location, well below the Sussex North Water Supply Zone average of 135 l/p/d (Water Neutrality Study: Part A – Individual Local Authority Areas July 2021). The Applicant is committed to achieving this ambitious target as the first step to achieving water neutrality.

2.2.2 In order to do so, the management of water in the proposed development will follow the principles of the Water Hierarchy and will employ a combination of water efficient fixtures, fittings and appliances:

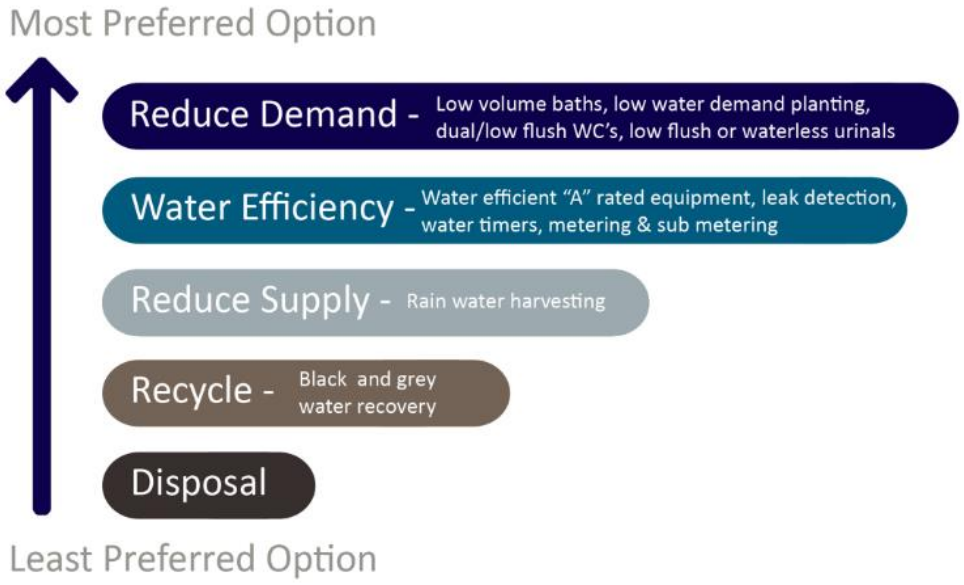


Figure 2: The Water Hierarchy

Water Efficient Fixtures and Fittings

2.2.3 Again, the accredited calculation methodology for Part G of the Water Regulations has been used to demonstrate that the specification for water fixtures and fittings currently proposed by the Applicant, shown in Table 1, will exceed the daily water use target, achieving 84.9 l/p/d. An extract from the Water Calculator is provided below, and details of the dishwasher and washing machine specification are given the Appendix.

Measure	Water Use	Indicative Product
Showers (l/min)	8	Aqualisa CMD100FS Thermostatic Bar shower with 8l/p/m flow regulator
Aerated taps (l/min)	5	ROCA Smooth Body Basin Mixer
Kitchen sink taps (l/min)	6	Reginox Ressini
Bath (l capacity)	130	Renaissance Grove
Low / dual flush WC (l)	4/2.6	Concealed Cistern Grohe 38661000 with 42333000 Adapter
Washing machine (l/kg dry load)	6	Bosch WAN24109GB
Dishwasher (l/place setting)	0.98	Bosch SMV40C40GB

Table 5: Proposed Water Efficiency Fixtures and Fittings Performance Standards

2.2.4 The actual products fitted in the dwellings may differ from the indicative specification given above due to availability and cost at the time of construction. However, the daily water use target will be achieved. The final specification used on the site will be confirmed later in the design process.

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	1.46	0.00	5.84
	Part flush Volume (litres)	2.6	2.96	0.00	7.70
WC (multiple fittings)	Average effective flushing Volume (litres)		4.42	0.00	0
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	5.00	1.58	1.58	9.48
Bath (where shower also present)	Capacity to overflow(litres)	130.00	0.11	0.00	14.30
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)	6.00	0.44	10.36	13.00
Washing Machine	(Litres/kg dry load)	6.00	2.1	0.00	12.60
Dishwasher	(Litres/place setting)	0.98	3.6	0.00	3.51
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)			101.39
	(6)	Contribution from greywater (litres/person/day)			0
	(7)	Contribution from rainwater (litres/person/day)			13.54
	(8)	Normalisation factor			0.91
	(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)			79.94
	(10)	External water use			5.0
	(11)	Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)			84.9

Installation Type	Make/Model (mandatory)	Litres/Person/Day
WC (dual flush)	Concealed Cistern Grohe 38661000 with 42333000 Adapter	13.54
Taps	ROCA Smooth Body Basin Mixer	9.48
Baths (shower(s) present)	Renaissance Grove	14.30
Showers (bath(s) present)	Aqualisa CMD100FS Thermostatic Bar shower with 8l/p/m flow regulator	34.96
Kitchen Taps	Reginox Ressini	13.00
Washing Machines	Bosch WAN24109GB	12.60
Dishwasher	Bosch SMV40C40GB	3.51
Contribution from rainwater (litres/person/day)	Flush volume	13.54

Figure 6: Part G Calculation for the converted dwelling

2.2.5 The proposed development comprises one new dwelling and when combined with extrapolated 2011 census data on average occupancy in Horsham District (as recommended in the *Water Neutrality and Planning Applications* section of the Horsham District Council website), we can

assume a typical occupancy of 2.47 people once the dwelling is completed. On that basis, the additional water demand resulting from the conversion is:

2.57 x 365 days x 84.9l = 76,542l

2.3 Rainwater Harvesting System for the New Building

2.3.1 Achieving the water usage figure of under 85 l/p/d through efficient fixtures and fittings alone could lead to a poor 'water experience' for residents, particularly in relation to shower use, increasing the risk of fixtures immediately being replaced with units with higher flow rates.

2.3.2 To avoid this scenario, the Applicant will install individual rainwater recycling systems to the property to supply water for some non-potable uses including WC flushing and garden irrigation. The rainwater harvesting system to be installed will capture rainwater from the building roof and store this within a rainwater tank. The tank will be sized so that, over the course of a year, they will be able to provide the required average daily rainwater contribution to overall demand. A secondary plumbing system then enables the collected water to be used in the target locations within the property.

Choice of System

2.3.3 Many variations on system design and configuration are available. The actual systems to be employed at this site and their final specifications will be fixed later in the design process and in order to meet the full specification details requested by the council this will need to be provided by pre-occupation condition.

2.3.4 For the purposes of this Statement we have assumed that the 'rainsava' (classic or eco pro) system (or equivalent) will be used. This system offers superior filtering and cleaning of rainwater, removing as much debris as possible prior to storage of the water.

2.3.5 The system installed will, of course, be BS8515 compliant.

Available Rainwater and Sizing

2.3.6 The Water Calculator (Appendix B) has been used to size an indicative rainwater harvesting system such that, when combined with the efficiency measures, it reduces mains water use to below the 85 l/p/d target. The total annual rainwater demand is calculated as:

13.54 x 2.47 x 365 = 12,170l

2.3.7 The total collectable volume of rainwater in this location is calculated using local rainwater data from the Met Office, which shows an average annual rainfall of 858l (the 20 year average). We then apply a reduction of 10% for climate change, and a further 10% based on efficiency of the rainwater harvesting system itself. The total roof area from which water can be collected is 176m2.

858mm x 176m^2 x 0.9 x 0.9 = 122,000l/a

2.3.8 On that basis, there is plenty of rainwater collection capacity available to meet the required demand. We would anticipate the size of the rainwater storage tank to be in the region of 1.2m^3.

This is based on meeting the daily water needs for toilets for typical occupancy and allowing for a 35-day drought period:

13.54l (daily water demand for WC per person) x 2.47 (occupancy) x 35 days = 1,170l storage

Cleaning

2.3.9 Typically there are various levels of treatment and filtering in the system prior to use within toilets within the properties. This would include a leaf filter, located in the guttering that feeds the system from the roof, to prevent larger items and detritus from entering the storage tank. A second slotted filter is then fitted into the rainwater supply pipe to block debris above around 10mm in diameter. A third mesh filter allows water and anything below 1mm in diameter to feed into the tank. Anything larger would be held in the filter and eventually flushed out via the overflow when the tank fills. The pump, which pumps water then to a header tank, also has a mesh filter which then strains the water prior to entry into the property. Within the property there is another fine filter adjacent to the tank, providing another level of filtering prior to storage in the header tank.

2.3.10 In the case of the 'rainsava' system there is a four stage cleaning process of

- Filtration – their Vortex fine filter (shown below) ensures water is clean and oxygenated to support the inhibition of anaerobic bacteria



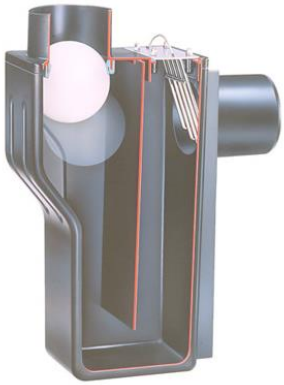
- Sedimentation – the systems inlet valve (shown below) allows water to enter the tank at its base within minimum tubulence, whilst adding oxygen, such that only very fine sediments can quickly settle to the bottom of the tank



- Floating extraction – the floating suction filter with ball float (shown below) enables the water to be extracted from the cleanest part of the tank, just below the surface, whilst avoiding any floating particles



- Surface skimming – the multifunctional overflow unit (shown below) enables regular flushing of the top layer of surface water preventing a surface barrier layer from forming, and enabling oxygen exchange. The overflow also has an odour seal, providing overall tank protection and full BS8515 compliance



Maintenance

2.3.11 The maintenance requirements of the rainsava system are provided in detail in the appendix, for information. It is anticipated that the 3 monthly checks and filter washing would need to be carried out by the resident, with annual maintenance as appropriate to meet the requirements of the system warranty.

3 Offsetting Solution

3.1.1 The total additional annual demand from the conversion is calculated as 76,542l, which is the amount that needs to be offset.

3.1.2 The total existing demand is shown to be 203,511l.

3.2 Solution Part One – Additional Rainwater Harvesting for the Farm

3.2.1 All of the agricultural water demand is to be removed from the public water network (a total of 75,250l shown in paragraph 2.1.2), and fed solely from an expansion of the existing rainwater harvesting system which also serves Location D. The connections to the existing public water network will be permanently removed – and evidence that this has been done can be secured via condition.

3.2.2 In so doing the remaining (negligible) offset to be secured is

76,542l – 75,250l = 292l / annum

RWH Calculations

3.2.3 Table 6 below provides the required detail in respect of rainwater harvesting calculations for the site, based on rainfall data for this location. We have assumed a hydraulic filter efficiency of 90% and an appropriate yield co-efficient of 90%. The areas of each of the poly tunnels, of which there are four, and which are used to capture the rainwater, are shown too.

	Value	Unit	Notes
Rainfall in this location	858.7	mm/a	
Rainfall including climate impact (10% rainfall reduction)	858.7	mm	
Collectable rainfall volume	0.8587	m3/m2	
Collection areas			
Poly Area 1 (existing)	175	m2	already in place, to 96,000l tank
Poly Area 2	140	m2	not yet collected, for offset (70m3)
Poly Area 3	148	m2	not yet collected, for crops
Poly Area 4	94	m2	not yet collected, for offset (70m3)
Total **additional** potential collection area	382	m2	
Maximum annual rainfall volume	328	m3	
Hydraulic filter efficiency (whole site)	0.9		
Yield co-efficient - all poly tunnels	0.9		
Actual annual potential collection volume	**266**	**m3**	
Poly Area 2	97.4	m3	
Poly Area 3	102.9	m3	
Poly Area 4	65.4	m3	
WN Offset required	76.542	m3	As calculated in this report
Farm daily water demand	206	l/day	As calculated in report from meter readings
Farm annual water demand	75,250	litres/a	As calculated in report from meter readings
Total 50 days storage to allow for drought	10,304	litres	This is the min. additional RWH tank size needed to service the crop irrigation
Offset achieved by improving WE in farmhouse	18,323	litres/a	
Total combined offset	**93,573**	**litres/a**	

Table 6: Rainwater harvesting calculations

3.2.4 Polytunnel 1 is already used for rainwater harvesting for the farm hydroponic, connected to an existing 96,000l tank, shown in Figure 7 as TANK 1. This, previously, was topped up with c.75m^3 of mains water every year, as shown above. This will now be disconnected entirely from the mains.

3.2.5 Polytunnels 2, 3 and 4 provide ample additional collection capacity, again as shown within the table. A further 36,000 litre tank will also be installed and connected to these poly tunnels, shown as TANK 2 on the plan. Tank 2 will be connected to Tank 1, to enable water to be distributed across the site as required, and to optimise the amount of collection available. It should also be noted that there are a number of storage and feed mixer tanks already installed on the site, shown lettered in Figure 7. These tanks are an integral part of the horticultural hydroponic operations on the site, but in essence provide an additional 21,000 litres of storage.

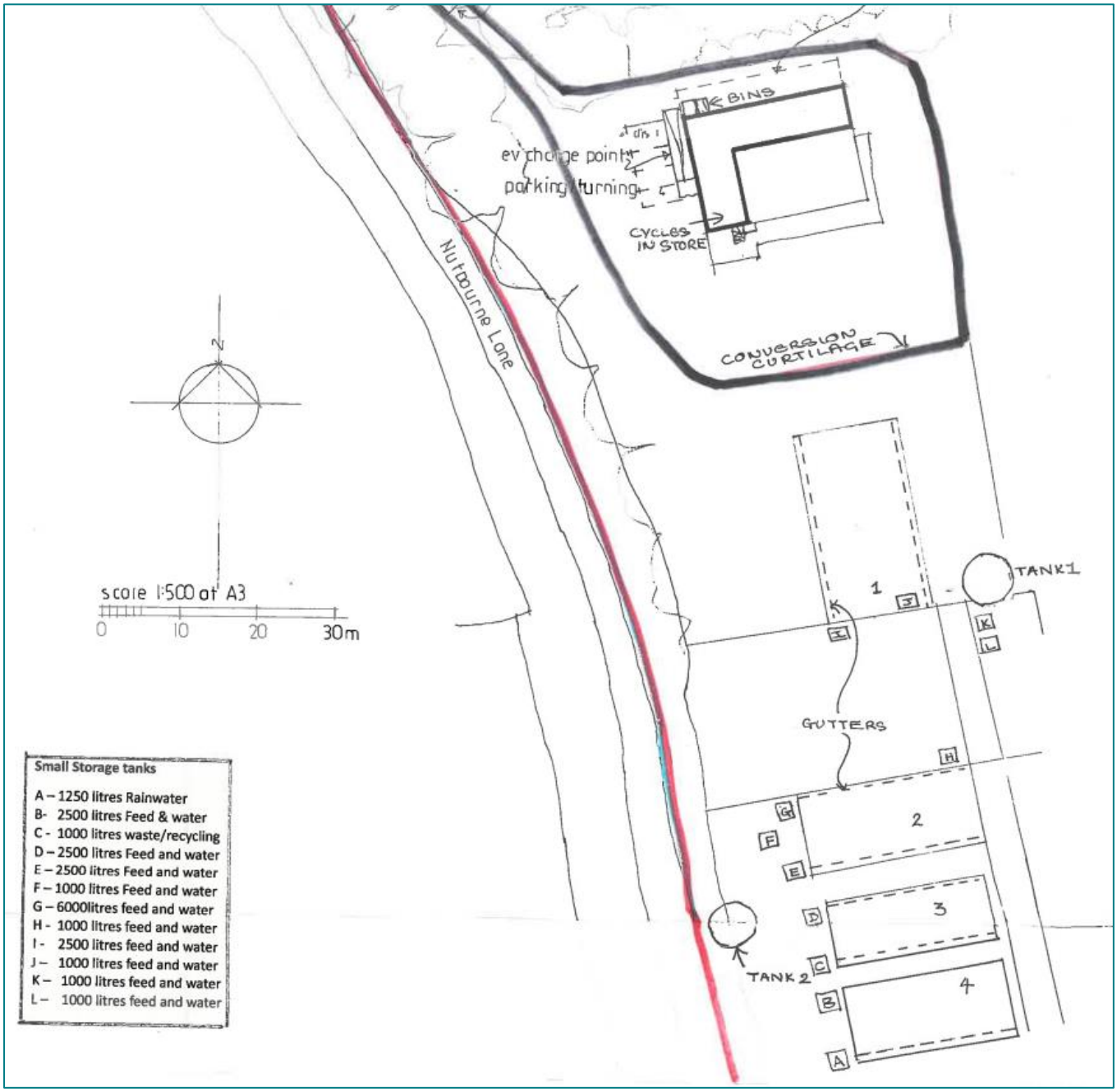


Figure 7: Rainwater harvesting locations

3.2.6 Taking account of the levels of rainfall, its collection, the system efficiency and an assumption that at least 50 day's additional storage to meet the Water Neutrality requirements (and collect , the actual additional storage requirement to collect c.75,250 litres annually for the site is only 10,304 litres. It is therefore clear that by providing an additional 36,000l tank, that the site will have an excess of rainwater provision, and give sufficient comfort from a Water Neutrality perspective that the target will be achieved.

3.2.7 For clarity, none of the rainwater harvested on the site will be used for human consumption, or for non-potable human uses such as toilets and washing machines. It will be used entirely for the farm's food growing operations. Indeed for the farm, rainwater is ideal since it has the correct PH level for plants/crops and no background electrical conductivity that in turn helps with the nutrient recipes given to the crops. For the farm, therefore, the additional rainwater harvesting is both easy, helpful and an ideal addition to its operations.

3.3 Offsetting Solution Part Two – Improving Existing Water Efficiency in the Farmhouse

3.3.1 This remainder shall be met by improving the water efficiency of the fixtures and fittings in Location A, the farmhouse. Specifically, we propose that taps are replaced so that they do not exceed 4l/minute from the current highly variable flow rates (replacements are highlighted yellow):

Farm				
DW1	1.25	Unknown / default	0.76	
DW2	0.76	Zanussi ZDLN1511	0.76	
WM	10.8	Bosch ClassiXX 1000 Express	10.8	Bosch ClassiXX 1000 Express
Shower 1 - main	12	l/min	12	l/min
Shower 2 - guest	6.4	l/min	6.4	l/min
Kitchen 1 Tap	18	l/min	4	l/min
Kitchen 2 Tap	20	l/min	4	l/min
Utility 1 Tap	12	l/min	4	l/min
Utility 2 Tap	30	l/min	4	l/min
Downstairs toilet tap	12	l/min	4	l/min
Pom tap	2	l/min	2	l/min
Ben tap	12	l/min	4	l/min
Guest tap	2	l/min	2	l/min
Main bed tap	4	l/min	4	l/min
Laura tap	12	l/min	4	l/min
Barn loo tap	12	l/min	4	l/min
Toilets	8	l/flush	8	l/flush
Pom Bath	247	l	247	l
Laura Bath	247	l	247	l
Ben Bath	385	l	385	l

Figure 8: replacement fixtures and fittings

3.3.2 The impact on the Part G Calculation is shown overleaf:

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)	8.00	4.42	0.00	35.36
WC (dual flush)	Full flush Volume (litres)		1.46	0.00	0
	Part flush Volume (litres)		2.96	0.00	0
WC (multiple fittings)	Average effective flushing Volume (litres)		4.42	0.00	0
Taps (excluding kitchen/utility room taps)	Flow rate (litres/min)	3.56	1.58	1.58	7.20
Bath (where shower also present)	Capacity to overflow(litres)	293.00	0.11	0.00	32.23
Shower (where bath also present)	Flow Rate(litres / minute)	9.20	4.37	0.00	40.20
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)	19.00	0.44	10.36	18.72
Washing Machine	(Litres/kg dry load)	10.80	2.1	0.00	22.68
Dishwasher	(Litres/place setting)	1.01	3.6	0.00	3.62
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)			160.01
	(6)	Contribution from greywater (litres/person/day)			0
	(7)	Contribution from rainwater (litres/person/day)			0
	(8)	Normalisation factor			0.91
	(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)			145.61
	(10)	External water use			5.0
	(11)	Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)			150.6

Table 7: Enhanced farmhouse Part G Calculation

3.3.3 The resulting calculated daily water demand is 150.6l per day, down from the 175.7l shown above - which is 25.1l per person per day. Over the course of a year, this will result in water savings from the public water main of:

25.1 (litres) x 2 (people) x 365 (days) = 18,323 litres

3.3.4 This is far in excess of the 292 litres needed – and therefore in combination with Solution One ensures the site achieves water neutrality – with significant additional savings to give the council and Natural England confidence (in line with conservative and robust appropriate assessment) that the savings will be achieved in practice.

3.4 Legal Requirements and Implications

3.4.1 As there are no third parties involved in the provision of offsetting measures, then there is no requirement to involve any other party in the resulting Section 106 agreement for the site in terms of delivering water neutrality solutions (as is the case in other Horsham development locations). On the assumption that Horsham District Council and Natural England agree to this approach in principle, we would expect this solution to be implemented via the planning process.

That is, we anticipate that the two solutions shown – will be secured via condition, with the Applicant providing the required evidence of installed measures prior to Occupation of the new home, which will specifically include evidence of:

- the disconnection of Location D from the water main
- the expansion of the agricultural rain water harvesting system
- the installation of the new taps to Location A (photographic and technical specification)
- installation of the final fixtures and fittings to the converted dwelling (final Part G Calculator, associated photographic evidence and technical specifications)

3.4.2 The Applicant will proactively engage with the council to agree the appropriate wording of the condition to ensure the proposed solutions will be implemented prior to occupation and in line with this Water Neutrality Statement.

4 Conclusions and Recommendations

4.1.1 This *Water Neutrality Statement* has been commissioned by the Gillen family to describe the approach to water efficiency and neutrality for the proposed conversion of an existing café building into agricultural residential accommodation, at Nutbourne Place Farm, Nutbourne, within Horsham district.

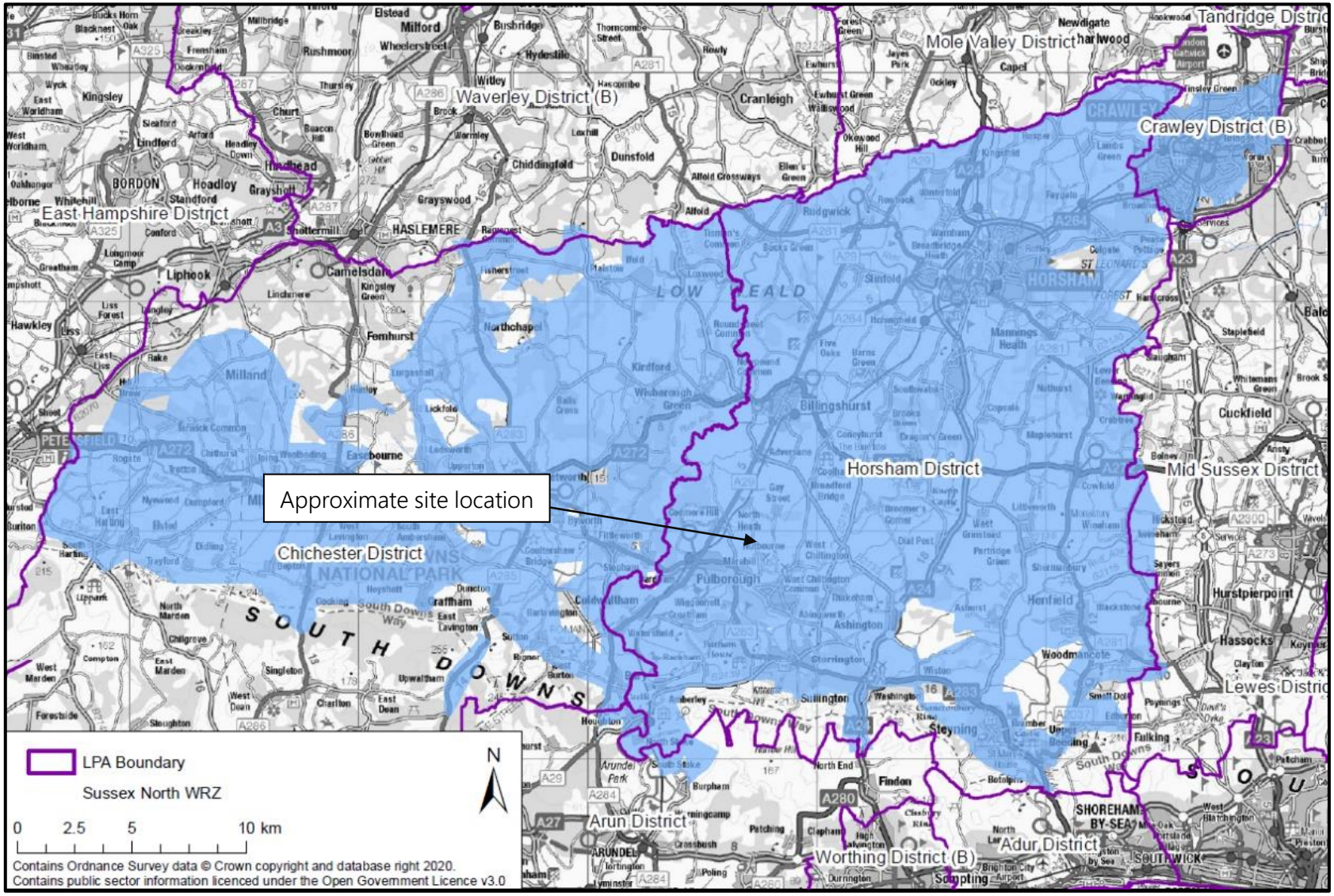
4.1.2 It demonstrates the proposed approach which has been designed to comply with the requirements of the Natural England *Position Statement for Applications within the Sussex North Water Supply Zone (September 2021 Interim Approach)* and subsequent updates.

4.1.3 The information and calculations presented demonstrate that the water efficiency interventions described will ensure that the proposed redevelopment will not result in an increase in water use at the site.

4.1.4 In fact, by employing a combination of highly efficient fixtures, fittings and appliances plus rainwater recycling (water butts), the daily water use figure on site will be reduced thus ensuring that the proposed revisions have a positive effect on net water use in the area.

4.1.5 In committing to achieve water neutrality, the Applicant has demonstrated an understanding of the importance of this issue, one which they have worked proactively to resolve, securing a robust approach which we trust is acceptable to Horsham District Council and Natural England.

5 Appendix A: Map of the Affected Area



6 Appendix B: Existing appliances (farmhouse and cottage)

Farmhouse dishwasher	Farmhouse dishwasher 2
	
Farmhouse washing machine	**Cottage washing machine**
	
Cottage dishwasher	
	

7 Appendix C: Indicative Appliance Specifications (agricultural conversion)

Dishwasher

Product information sheet

COMMISSION DELEGATED REGULATION (EU) 2019/2017

Supplier's name or trade mark [a] [b] **:**	Bosch
Supplier's address [a] [b] **:**	BSH Hausgeräte GmbH, Carl-Wery-Str. 34, 81739 Munich, Germany
Model identifier [a] **:**	SMV40C40GB

General product parameters:

Parameter	Value	Parameter	Value	
Rated capacity [d] (ps)	12	Dimensions in cm [a] [b]	Height	82
			Width	60
			Depth	55
EEI [d]	61.9	Energy efficiency class [d]	F [c]	
Cleaning performance index [d]	1.121	Drying performance index [d]	1.061	
Energy consumption in kWh [per cycle], based on the eco programme using cold water fill. Actual energy consumption will depend on how the appliance is used.	1.022	Water consumption in litres [per cycle], based on the eco programme. Actual water consumption will depend on how the appliance is used and on the hardness of the water.	11.7	
Programme duration [d] (h:min)	3:30	Type	Built-in	
Airborne acoustical noise emissions [d] (dB(A) re 1 pW)	50	Airborne acoustical noise emission class [d]	C [c]	
Off-mode (W) (if applicable)	-	Standby mode (W) (if applicable)	0.10	
Delay start (W) (if applicable)	4.00	Networked standby (W) (if applicable)	0.00	
Minimum duration of the guarantee offered by the supplier [a] [b] **:**			24 months	

Additional information [a] [b] **:**

Weblink to the supplier's website, where the information in point 6 of Annex II to Commission Regulation (EU) 2019/2022 is found: www.bosch-home.com/energylabel

1 02.01.2023

[a] this item shall not be considered relevant for the purposes of Article 2(6) of Regulation (EU) 2017/1369.

[b] changes to these items shall not be considered relevant for the purposes of paragraph 4 of Article 4 of Regulation (EU) 2017/1369.

[c] if the product database automatically generates the definitive content of this cell the supplier shall not enter these data.

[d] for the eco programme.

Washing Machine

Product Information Sheet

COMMISSION DELEGATED REGULATION (EU) 2019/2014 with regard to energy labelling of household washing machines and household washer-dryers

Supplier's name or trade mark: Samsung

Supplier's address: Public and Compliance Contact, Samsung PO Box 12987 Blackrock Co.Dublin Ireland / Saxony Way, Yateley, GU46 6GG, UK

Model identifier: WW90TA046AX

General product parameters:

Parameter	Value		Parameter	Value	
Rated capacity[a] (kg)		9,0	Dimensions in cm	Height	85
				Width	60
				Depth	55
Energy Efficiency Index[a] (EEI_W)		51,9	Energy efficiency class[a]	A	
Washing efficiency index[a]		1,031	Rinsing effectiveness (g/kg)[a]		5,0
Energy consumption in kWh per cycle, based on the eco 40-60 programme at a combination of full and partial loads. Actual energy consumption will depend on how the appliance is used.		0,494	Water consumption in litre per cycle, based on the eco 40-60 programme at a combination of full and partial loads. Actual water consumption will depend on how the appliance is used and on the hardness of the water.		50
Maximum temperature inside the treated textile[a] (°C)	Rated capacity	31	Weighted remaining moisture content[a] (%)		53,9
	Half	27			
	Quarter	21			
Spin speed[a] (rpm)	Rated capacity	1 400	Spin-drying efficiency class[a]	B	
	Half	1 400			
	Quarter	1 400			
Programme duration[a] (h:min)	Rated capacity	3:48	Type	Free-standing	
	Half	2:54			
	Quarter	2:36			
Airborne acoustical noise emissions in the spinning		72	Airborne acoustical noise emission class[a] (spinning phase)	A	

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phase[(a)] (dB(A) re 1 pW)			
Off-mode (W) (if applicable)	0,50	Standby mode (W) (if applicable)	-
Delay start (W) (if applicable)	4,00	Networked standby (W) (if applicable)	N/A
Minimum duration of the guarantee offered by the supplier: 24 months			
This product has been designed to release silver ions during the washing cycle	**NO**		
Additional information:			
Weblink to the supplier's website, where the information in point 9 of Annex II to Commission Regulation (EU) 2019/2023 is found: https://www.samsung.com/support			

(a) for the eco 40-60 programme.