DAEDALUS ENVIRONMENTAL

Mercer Road, Horsham

Water Neutrality Statement

March 2025

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1 Introduction

1.1 This Statement

1.1.1 This Water Neutrality Statement supports, and forms part of, the detailed planning application submitted for the proposed development at Mercer Road, Horsham, by Riverdale Developments (the Applicant).

1.1.2 It has been commissioned by the Applicant to demonstrate how the development proactively addresses the issue of sustainable use of water, and how it responds to the requirement for Water Neutrality for all developments located within the Sussex North Water Supply Zone. In September 2021 Natural England released a statement – substantive advice – in respect of new developments within this zone. Specifically, it states that:

> The Sussex North Water Supply Zone includes supplies from a groundwater abstraction which cannot, with certainty, conclude no adverse effect on the integrity of:
>
> - Arun Valley Special Area Conservation (SAC)
> - Arun Valley Special Protection Area (SPA)
> - Arun Valley Ramsar Site.
>
> As it cannot be concluded that the existing abstraction within Sussex North Water Supply Zone is not having an impact on the Arun Valley site, we advise that developments within this zone must not add to this impact.
>
> *Natural England's Position Statement for Applications within the Sussex North Water Supply Zone (September 2021)*

1.1.3 The affected area is shown on the map, an extract of which is provided below, issued to accompany this advice note. The location of the proposed development at Mercer Road, to which this report refers, is identified circled red:

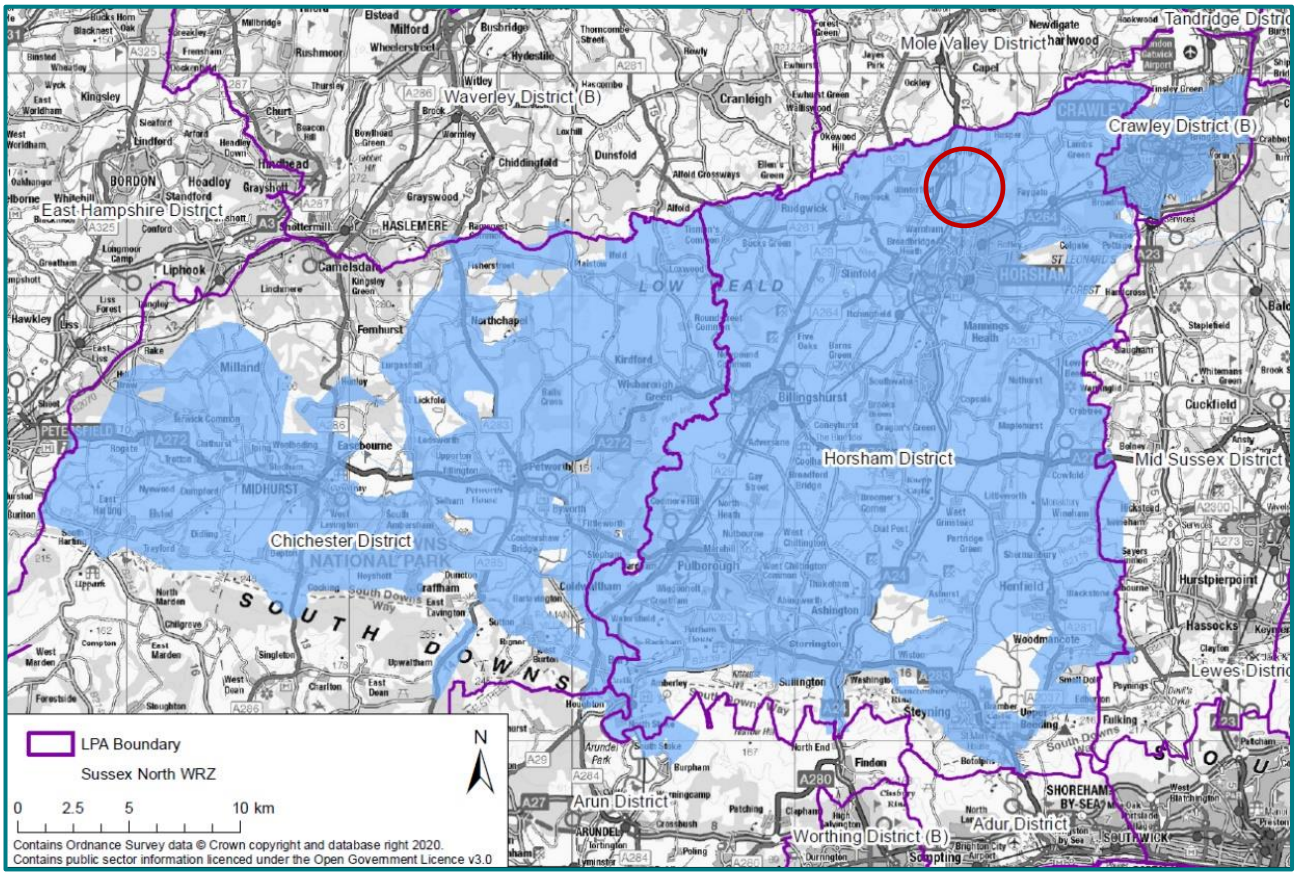

Figure 1: Sussex North Water Supply Zone & site location

1.1.4 The impact of this substantive advice from Natural England effectively requires all new development falling within this catchment area to demonstrate water neutrality. There are a number of methods for demonstrating this, based on the initial site circumstances, including:

- For brownfield (redevelopment) sites with existing water use, demonstrate a reduction in water use from the existing, pre-redevelopment scenario
- For greenfield sites with access to onsite water resources (typically a borehole facility) and capacity to accommodate new treatment works, demonstrate that there will be no impact on the existing water network
- For greenfield sites without this capability, demonstrate that all reasonable water efficiency measures and solutions that can be installed on site, have been, with the aim of reducing water use to 85l/person/day. The remainder needs to be offset, of which more below.

1.1.5 This development falls into the third category. The methodology at this stage is therefore as follows:

1. set the performance standard for all new dwellings (and fixtures/fittings etc) to come forward on site

2. calculate the expected water use (and the residual, offset requirement on an illustrative basis) and explain the methodology for doing so, and how this will be updated at detailed design
3. agree the likely occupancy of the development and calculate the likely offset needs for the site as a whole

1.1.6 The Applicant's proposal, in respect of the resulting water offset mechanism, is contained in the final section of this Statement.

1.2 Site Description and Layout

1.2.1 The site is located to the northern and southern sides of Mercer Road, bordered to the east by Langhurstwood Road. The proposals include the development of 304 new homes of varying sizes, a combination of private and affordable houses and apartments. The location of the site, and the illustrative masterplan, are shown below:

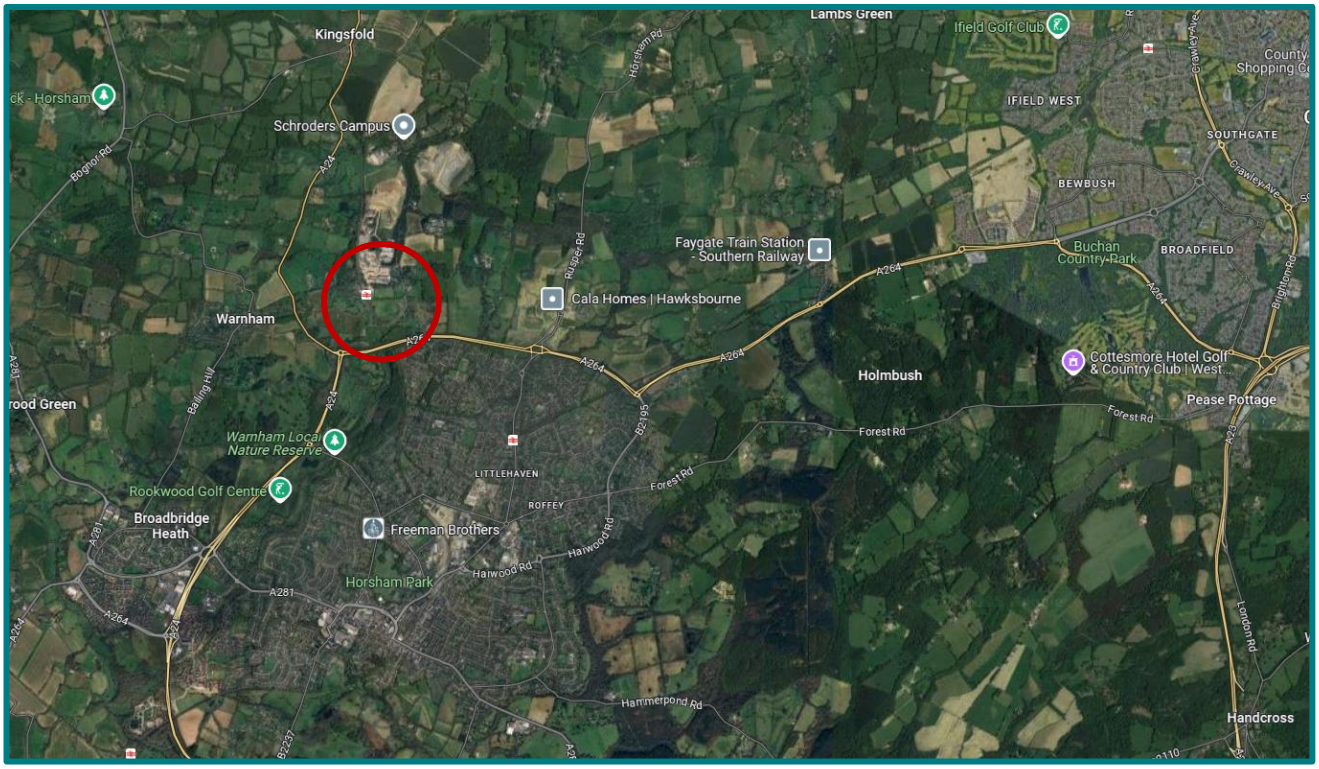

Figure 2: Site location

Figure 3: Site location plan (approximate boundary)

Figure 4: Site layout plan

2 Scale and Scope of Water Demand

2.1 General Approach

2.1.1 We consume a vast amount of potable water in non-potable situations, including flushing the toilet, washing the car and irrigating our gardens. Only a small proportion of our potable mains water is used for drinking, cooking and personal washing:

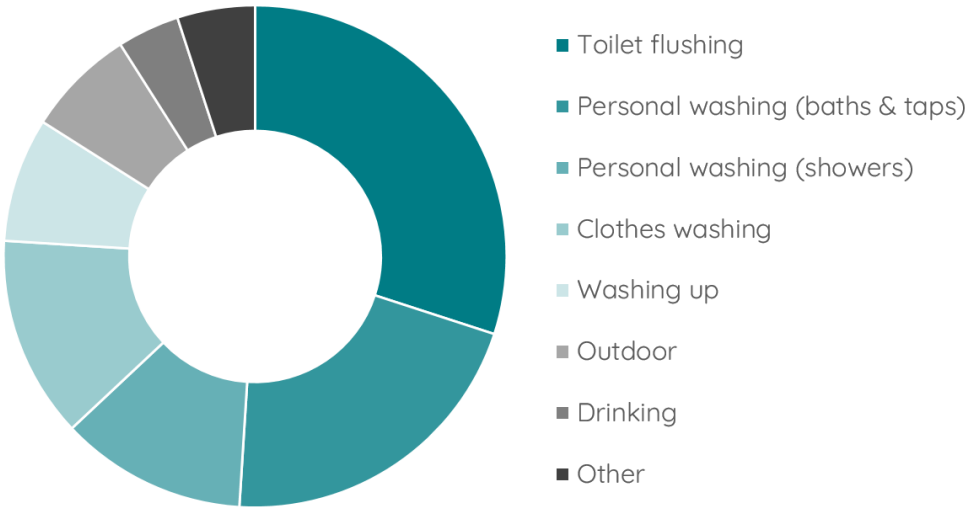

Figure 5: UK Domestic Water Consumption by End Use

2.1.2 The national average for water consumption is around 143l per person per day. In order to reduce this figure, the management of water in the proposed development will follow the principles of the water hierarchy:

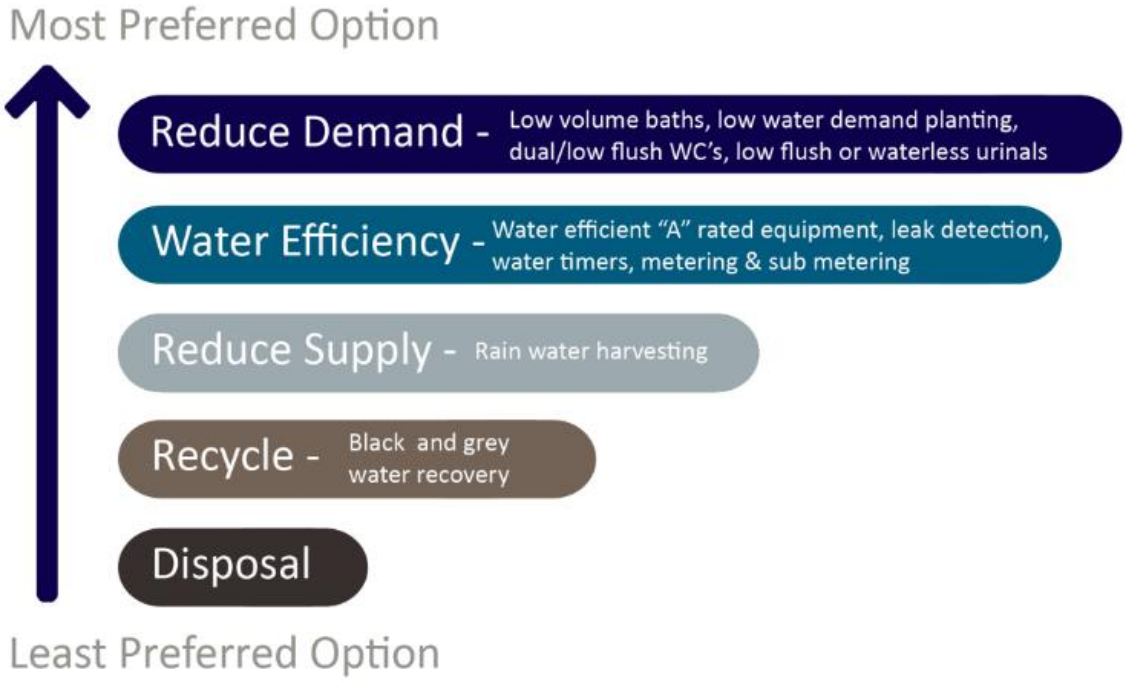

Figure 6: The Water Hierarchy

2.2 Efficiency and Targets

2.2.1 The Applicant is committing to achieve a calculated maximum daily water use of 85 litres per person per day on site.

2.2.2 This will be calculated and demonstrated using the accredited calculation methodology for Part G of the Water Regulations, taking account of all fixtures and fittings – and recycling technologies – specified within the development.

Fixtures/Fittings

2.2.3 The final specification to be used on the site to achieve the daily water use target will be confirmed later in the design and specification process, however all of these performance figures are achievable with widely available products on the market.

Measure	Water Use	Example of Product
Showers (l/min)	9.5	Grohe Cosmopolitan 160 27668000
Aerated taps (l/min)	2.5	Grohe UK Europlus OHM 3261220L
Kitchen sink taps (l/min)	5	Vitra Flow Mixer A4204523EXP
Bath (l capacity)	131	Armitage Shanks Sandringham 21 S1832
Low / dual flush WC (l)	4/2.6	Armitage Shanks s3046 close coupled, Conceala cistern
Washing machine (l/kg dry load)	4	Hisense WFQA8014EVJMT
Dishwasher (l/place setting)	0.68	Bosch Series 6 SMD6YCX01G (9.5l/cyc, 14 place settings)

Table 1: Water efficiency performance standards

Rainwater Recycling

2.2.4 Achieving the water usage maximum figure of 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.

2.2.5 To avoid this scenario, the Applicant will also install rainwater recycling systems to the properties to supply water for non-potable uses including WC flushing and garden irrigation. With the domestic sector currently consuming a large proportion of potable water in non-potable situations, this will significantly help maximise efficiency on the development without relying solely on internal fixtures and fittings.

2.2.6 The rainwater harvesting systems to be installed will capture rainwater from the building roofs and store this within a rainwater tank which is typically buried in the garden (in the case of houses) or within the curtilage of the property (in the case of flats). The tanks are 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.

2.2.7 The Water Calculator has been used to estimate the quired volume of an indicative rainwater harvesting system such that, when combined with the efficiency measures, it reduces mains water use to c.80l/person/day. The rainwater harvesting system has currently been sized such that it can deliver **16l/person/day** on average throughout the year. For clarity, the logic on this sizing is that without the rainwater harvesting, the total water demand as calculated by the Part G water calculator – excluding RWH, the normalisation factor and irrigation - is c. 94l/person/day. The approximate sizing of the RWH at this stage (at a daily 16l) drives the final figure down to 80l/person/day, once normalisation and irrigation are brough back into the calculation. The detail is provided in FIGURE 7.

2.2.8 We have therefore taken the position to size the RWH to exceed the requirement of 85l/person/day, i.e. this is therefore a conservative position and adds additional confidence that - even with some flexibility in the illustrative specification provided at this stage - the target of 85l can be comfortably achieved.

2.2.9 Illustratively, with the RWH system sized to deliver 16l/person/day, it will:

a. Meet the WC demand calculated at 13.54l/person/day with the balance....
b. ...contributing towards the irrigation need (within the Part G water calculator) of 5l/person/day

2.2.10 The reader should please note that at this planning stage detailed system design has not been undertaken, and that 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 when discharging conditions for the site.

2.2.11 In the interim we have provided an illustrative rainwater harvesting calculation for a 3 bedroom property and a total roof collection area of 50m^2 for this location. It is estimated that to provide sufficient rainwater for a period of drought of 35 days, the tank size will need to be c.1.35m^3. The rainfall data source is for the 20 year period to end 2024, sourced from DEFRA's Hydrology Data Explorer: Hydrology Data Explorer.

Indicative Rainwater Harvesting Calculations		
Rainfall in this location	793.85	mm/a
Collectable rainfall volume	0.794	m^3/m^2
PITCHED ROOF		
Collection Area - pitched	50	m^2
Max collectable rainfall volume	39.69	m^3/a
Hydraulic filter efficiency	0.9	
Yield co-efficient	0.8	
Actual annual collection volume	**28.58**	**m^3/a**
Actual annual collection volume	**28,579**	**l/a**
TOTAL	**28,579**	**l/a**
Annual demand (2.4 people, 16l per day per person, 365.25 days p.a.)	**14,026**	
TOTAL	14,026	l/a
Tank size estimate (35 days' drought allowance)	1,344	l
Tank size estimate (35 days' drought allowance)	1.344	m^3

Table 2: Indicative rainwater harvesting calculation (3-bedroom property)

2.3 Calculations

2.3.1 The results of the water efficiency calculations are provided in the extract from the calculator below, where we have assumed 900mm annual rainfall in this location, and for this sample property calculation a collection area of 45m²:

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)	2.50	1.58	1.58	5.53
Bath (where shower also present)	Capacity to overflow(litres)	131.00	0.11	0.00	14.41
Shower (where bath also present)	Flow Rate(litres / minute)	9.50	4.37	0.00	41.52
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)	5.00	0.44	10.36	12.56
Washing Machine	(Litres/kg dry load)	4.00	2.1	0.00	8.40
Dishwasher	(Litres/place setting)	0.68	3.6	0.00	2.45
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)**			98.41
	(6)	Contribution from greywater (litres/person/day)			0
	(7)	Contribution from rainwater (litres/person/day)			16
	(8)	Normalisation factor			0.91
	(9)	Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day)			74.99
	(10)	External water use			5.0
	(11)	**Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day)**			80.0

Figure 7: Part G Water Calculator

2.4 Occupancy

2.4.1 We have aligned required assumptions on level of occupancy set by Horsham to the size of the dwelling, which results in a total accommodated population of c. 676 people:

Type	Beds	Number	Household Occupancy	Site Population	Daily Consumption (l)	Annual Consumption (l)
A1	1	12	1.32	15.84	1,346	491,436
A2	1	2	1.32	2.64	224	81,906
A3	1	4	1.32	5.28	449	163,812
A4	2	7	1.88	13.16	1,119	408,289
A5	2	8	1.88	15.04	1,278	466,616
A6	1	3	1.32	3.96	337	122,859
A7	2	8	1.88	15.04	1,278	466,616
A8	2	4	1.88	7.52	639	233,308
A9	1	4	1.32	5.28	449	163,812
H1	2	29	1.88	54.52	4,634	1,691,483
H2	2	29	1.88	54.52	4,634	1,691,483
H3	2	1	1.88	1.88	160	58,327
H4	2	1	1.88	1.88	160	58,327
H5	3	30	2.47	74.1	6,299	2,298,953
H7	4	7	2.86	20.02	1,702	621,121
H8	4	12	2.86	34.32	2,917	1,064,778
H9	4	12	2.86	34.32	2,917	1,064,778
H10	4	8	2.86	22.88	1,945	709,852
H11	4	16	2.86	45.76	3,890	1,419,704
H13	3	45	2.47	111.15	9,448	3,448,429
H14	3	32	2.47	79.04	6,718	2,452,216
AA8	2	3	1.88	5.64	479	174,981
AA9	1	4	1.32	5.28	449	163,812
AA10	1	3	1.32	3.96	337	122,859
AA11	1	3	1.32	3.96	337	122,859
AH1	2	7	1.88	13.16	1,119	408,289
AH2	3	7	2.47	17.29	1,470	536,422
AH3	4	3	2.86	8.58	729	266,195
		304		**676.02**	**57,462**	**20,973,521**

Table 3: Occupancy, population and water demand for the new development

2.5 Offsetting Requirement (Volume)

2.5.1 On this basis, the total estimated offsetting requirement for this development will be approximately 20,973,521 litres per annum.

3 Meeting the requirement for Water Neutrality: Offsetting

3.1 SNOWS Scheme

3.1.1 SNOWS – the Sussex North Offsetting Water Scheme – offers the primary solution for Water Offsetting for the site. This development has a draft allocation (HA10-HOR2: 'Land at Mercer Road') in the local plan. There is therefore significant confidence that the site will be eligible for the SNOWS scheme, which we understand is to be launched imminently.

3.1.2 As such, the Applicant is proposing a negatively worded, or 'Grampian' style condition, which should enable Horsham Council, and Natural England, to conclude that there will be no absence of potential adverse effects on the Sussex North Water Neutrality Zone, and in particular the affected Arun Valley SAC, SPA and RAMSAR sites.

3.1.3 The Condition proposed at this stage would be to prevent ANY development progressing UNTIL the requisite number of credits is agreed and purchased under the SNOWS scheme. This would of course be contingent on the completion of a Section 106 Agreement containing the necessary clauses and arrangements, where required by the council.

3.1.4 There is now significant precedence for the use of Grampian Conditions in this regard, where there is a realistic prospect of the site's ability to access the SNOWS scheme. For example:

- the conclusions of the planning inspector pursuant to planning ref: APP/Z3825/W/23/3321658 (HDC Ref: DC/22/1052) in respect of an allowed appeal for outline application for the development of up to 133x dwellings at Land South of Broadbridge Farm, Broadbridge Heath. The Inspector agreed that a Grampian condition and S106 agreement would prevent any adverse impacts on the Arun Valley sites and be compliant with relevant Planning Policy Guidance, with a 'reasonable prospect' that relevant mitigation would be available within the lifetime of the appeal scheme
- The Inspectors conclusions reached pursuant to ref: APP/Z3825/W/23/3321658 in respect of the acceptability of Grampian style conditions in relation to the principles of Regulation 63 of the Habitats Regulations
- The conclusions of the appeal inspector pursuant to ref: APP/Z3825/W/22/3308455 (HDC ref: DC/21/2086) in allowing the appeal for an outline application for the development of up to 78x homes at Land West of Ravenscroft, Storrington
- The Inspector's endorsed recommendation to the Secretary of State pursuant to ref: APP/Z3825/W/23/3333968 (HDC ref: DC/23/0856) in allowing an appeal for the approval of reserved matters for the development of 280x dwellings within Kilnwood Vale
- The approval of outline application ref. DC/24/0428 in respect of Land North of Shermanbury Road, Partridge Green for the development of 120 new dwellings, which also proposes the same approach to water neutrality

3.1.5 Collectively, these decisions provide significant, and consistent, authority as to the acceptability of reserving details of off-site mitigation for approval under an appropriately worded Grampian style condition.

3.1.6 The development at Mercer Road will be eligible for SNOWS as a allocated scheme and therefore it is argued that this approach – to include an appropriately worded Condition which the Applicant is keen to discuss with the planning authority preventing any development until the point SNOWS offsetting credits have been agreed – is sufficient to give the Horsham Council, and Natural England, confidence that the scheme will be Water Neutral.

4 Conclusions & Recommendations

4.1.1 This Water Neutrality Statement has been commissioned by Riverdale Developments to describe the proposed approach to water efficiency and neutrality for the proposed new development at Mercer Road, Horsham.

4.1.2 It provides detail to demonstrate the emerging approach to comply with the requirements of the *Natural England Position Statement for Applications within the Sussex North Water Supply Zone 2021* .

4.1.3 The information and calculations presented show that the total water use on the proposed development will be greater than the water currently used on the site. Once water efficient fixtures and fittings have been factored in, it is currently calculated that the additional water use resulting from the proposed development is calculated to be almost 21m litres of water per year.

4.1.4 The Applicant will be using the SNOWS scheme to deliver the water offsetting credits needed given the site's status as a draft allocation in the local plan. The SNOWS scheme is due to become available in March/April 2025 and sufficient credits will be secured that meet the water neutrality requirement. Securing these credits will need an appropriately worded 'Grampian' style planning condition that prevents any development proceeding on the site until those credits are agreed and secured.

4.1.5 In committing to achieve water neutrality, the Applicant is demonstrating an understanding of the importance of this issue, proposing a robust approach with significant precedence which we trust is now acceptable to Horsham District Council and Natural England.