

Technical Note

**HaskoningDHV UK Ltd.
Industry & Buildings**

To: Shropshire County Council
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Subject: River Clun: Phosphate budget

1 Introduction

This technical note presents the findings of a review of local plan documents and housing projections that was undertaken to help understand the phosphate mitigation required to offset any potential impacts on phosphate loadings within the River Clun Special Area of Conservation (SAC) associated with future housing requirements in the Clun catchment.

2 Methods and assumptions

In order to understand the phosphate mitigation required to support the delivery of residential development in the Clun catchment, there is a need to understand the level of residential development proposed. As such, a review of the Draft Shropshire Local Plan and associated evidence base documents was undertaken to identify the level of residential development proposed within the Clun catchment. The additional phosphate loading from the proposed residential development was then calculated using the Phosphorus Budget Calculator (Royal HaskoningDHV, 2022). Worst-case scenarios were assumed to ensure the phosphate loading value was not underestimated.

2.1 The following assumptions were made:

All new dwellings were assumed to be houses with an average occupancy of 2.36 persons per dwelling. It should be noted that this is a precautionary figure. 2011 Census data indicates an average household occupancy rate in Shropshire of 2.36, this reduces to 2.30 when excluding the population in communal establishments. The 2014-based sub-national population and sub-national household projections, which exclude those in communal establishments, indicate an average household occupancy rate in Shropshire of 2.31 in 2016, reducing to 2.26 in 2022 and 2.19 in 2038).

- The pre-development land use of the sites was identified using aerial imagery.
- The proposed land use was assumed to be predominantly urban, with on-site green open space provision equivalent to 30sqm per person (consistent with existing policy requirements in the adopted Local Plan and proposed policy requirements within the Draft Shropshire Local Plan).
- Permit limits were retrieved from Severn Trent Water published values for the current AMP cycle and the future permit limits due to be in place prior to 2025.
- PTPs would be used in some rural locations (particularly in the Abcot, Beckjay, Clungunford, Hopton Heath, Shelderton and Twitchen (Three Ashes) Community Cluster) and these PTPs would operate at a removal rate of 90%.
- The assessment took a conservative approach by assuming that there would be no reduction in surface runoff from SuDS.
- The soil drainage type was derived from Soilscales and the dominant soil of the area was determined to be freely draining.

- The area of land required for the developments was estimated using aerial imagery, site layout plans and site allocation boundaries where possible.
- Where no plans exist (e.g. windfall), the area of land required was calculated by multiplying the projected number of dwellings by the plot size, which was assumed to be 0.036ha per dwelling. This is equivalent to 30 dwellings per hectare. It was assumed that a plot size of 0.036ha would provide a representative figure for the house, garden and accompanying roads / paths adjacent to the properties.
- The windfall allowances proposed in the Draft Shropshire Local Plan will be delivered in the Key Centre and Community Hub settlements with proposed residential development guidelines and are thus assumed to connect to the existing foul drainage system.
- The assessment includes residential development with planning permissions that still require phosphate mitigation (i.e., those with outline permission or consented but with drainage conditions).

2.2 Estimated phosphate loading

This assessment considers developments which are likely to be completed between 2022 and the end of the proposed plan period in 2038. The residential development guidelines were retrieved from the Draft Shropshire Local Plan which has been submitted to the Secretary of State for examination. These residential development guidelines will be achieved through a combination of; dwellings on proposed allocations within the Draft Shropshire Local Plan; dwellings on allocations within the Site Allocations and Management Development (SAMDev) Plan which was adopted in 2015 and which are not yet the subject of a planning permission (as at 31st March 2021) and are proposed to be saved as part of the Local Plan Review process; dwellings on sites with planning permission/prior approval (some of which still require phosphate mitigation i.e. those with outline permission or drainage conditions); and windfall allowances. Information on the location of allocated sites was taken from the Bishop's Castle Place Plan Area (S2) component of the draft Shropshire Local Plan (specifically draft Policies S2.1, S2.2, S2.3 and S2.4) and GIS data supplied by Shropshire Council. Windfall figures are derived from the total planning permissions for each settlement.

The total proposed housing delivery for the Clun catchment is provided in **Table 5-1**.

Table 5-1: Housing projections evidence base for the period 2022 – 2038.

Location of Dwellings	No. of dwellings				
	Permissions (requiring mitigation)	Saved SAMDev Allocations	Draft Local Plan Allocations	Windfall	Total
Bishop's Castle	18	40	0	35	93
Bucknell	0	70	20	8	98
Clun	1	60	20	8	89
Lydbury North	9	11	0	0	20
Abcot, Beckjay, Clungunford, Hopton Heath, Shelderton and Twitchen (Three Ashes)	4	0	0	0	4
Newcastle and Whitcott Keysett	0	0	0	0	0
Total	32	181	40	51	304

Development within the River Clun catchment is primarily located in Bishop's Castle (Key Centre) and Bucknell and Clun (Community Hubs) with a smaller number of remaining planning permissions and saved SAMDev allocations in the Lydbury North and Abcot, Beckjay, Clungunford, Hopton Heath, Shelderton and Twitchen (Three Ashes) Community Clusters. In the Draft Shropshire Local Plan, Key Centres and Community Hubs have site allocations, however, Community Clusters do not. Instead, any development within Community Clusters will need to meet the requirements of draft policy SP9 as well as provide a project level HRA (SAMDev policy MD12 and Draft Shropshire Local Plan policy DP12). The residential development guideline in SAMDev for the Abcot, Beckjay, Clungunford, Hopton Heath, Shelderton and Twitchen (Three Ashes) Community Cluster is not proposed to be saved in the Draft Shropshire Local Plan. It should also be noted that there are no planning permissions or allocations (either saved or proposed) for the Newcastle and Whitcott Keysett Cluster.

It was assumed that the sites with planning permission that require mitigation would be delivered by 2026 (i.e., within five years), as per the Shropshire Council Five Year Housing Land Supply Statement (2021). The Draft Shropshire Local Plan indicates that the allocations for Bucknell (site BKL008a) and Clun (site CLU005) are to be delivered in the long term (2035-2038).

The phosphate loading projections apply a precautionary principle and are likely to overestimate the actual loading from the proposed development. The following precautionary principles were adopted:

- That the new dwellings will either be occupied by people living outside the catchment, or in the case that someone living within the catchment occupies a new house, their existing house will be occupied by someone from outside of the catchment.
- An average occupancy rate of 2.36 was applied. Severn Trent Water have previously stated (River Clun Strategic Liaison Group meeting March 2022) that when this is used at a catchment scale it can overestimate the total loading. See methods and assumptions above also for additional precautionary assumptions.
- The discharge limit for the treatment works was assumed to be 90% of the permit limit. The treatment works within the catchment are all on average operating at less than 50% of their permit limit, with an average of 34%.
- A 20% precautionary buffer is applied to the total loading to account for any uncertainty in the figures used and to ensure there will be no adverse effect on site integrity.

The projected phosphate loading per settlement area is presented in **Table 5-2**. The total phosphate mitigation required for the period 2022 – 2038 is 20.65kg/yr.

Table 5-2: Total phosphate loading per settlement area

Location of Dwellings	Total dwellings (2022 - 2038)	Total Phosphate loading (kg/yr)
Bishop's Castle	93	5.89
Bucknell	98	4.73
Clun	89	6.07
Lydbury North	20	2.50
Abcot, Beckjay, Clungunford, Hopton Heath, Shelderton and Twitchen (Three Ashes)	4	1.46
Newcastle and Whitcott Keysett	0	0
Total	304	20.65

A detailed breakdown of the projected phosphate loading per settlement area from 2022 to 2038 is provided in **Table 5-3**.

The total additional phosphate load from the projected houses is predicted to be 20.65kg/yr over the period 2022 – 2038. This assumes a precautionary occupancy rate of 2.36 but if the trend for a reduction in this (as identified in **Section 5.1**) continues, the total additional phosphate load will decrease. The model also assumes that the planned upgrades to the Bishop's Castle wastewater treatment works will be implemented by 2025. However, there is the possibility that this could be delayed due to an extension application relating to the potential to transfer this treatment works' effluent out of the Clun catchment entirely. Should the effluent be removed from the catchment, any future developments connecting to the Bishops Castle WwTW would not increase the phosphate loading to the river and would thus be effectively nutrient neutral. Additionally, the use of developer contributions to part-fund the removal of the effluent has the potential to fully mitigate all the proposed development in the Clun catchment identified in **Section 5** of this report, as well as making a proportionately large contribution to the restoration of the River Clun SAC.

Table 5-3: Detailed phosphate loading per settlement area

Location of Dwellings	Total dwellings (2022 - 2038)	Phosphate loading (kg/yr)				
		Short-term (2022 – 2026)	Medium-term (2027– 2030)	Long-term (2031-2034)	Long-term (2035-2038)	Total
Bishop's Castle	93	3.69	0.74	0.74	0.74	5.89
Bucknell	98	1.00	0.80	0.80	2.13	4.73
Clun	89	1.36	1.05	1.05	2.61	6.07
Lydbury North	20	1.66	0.28	0.28	0.28	2.50
Abcot, Beckjay, Clungunford, Hopton Heath, Shelderton and Twitchen (Three Ashes)	4	1.46	0.00	0.00	0.00	1.46
Newcastle and Whitcott Keysett	0	0	0	0	0	0
Total	304	9.17	2.86	2.86	5.76	20.65