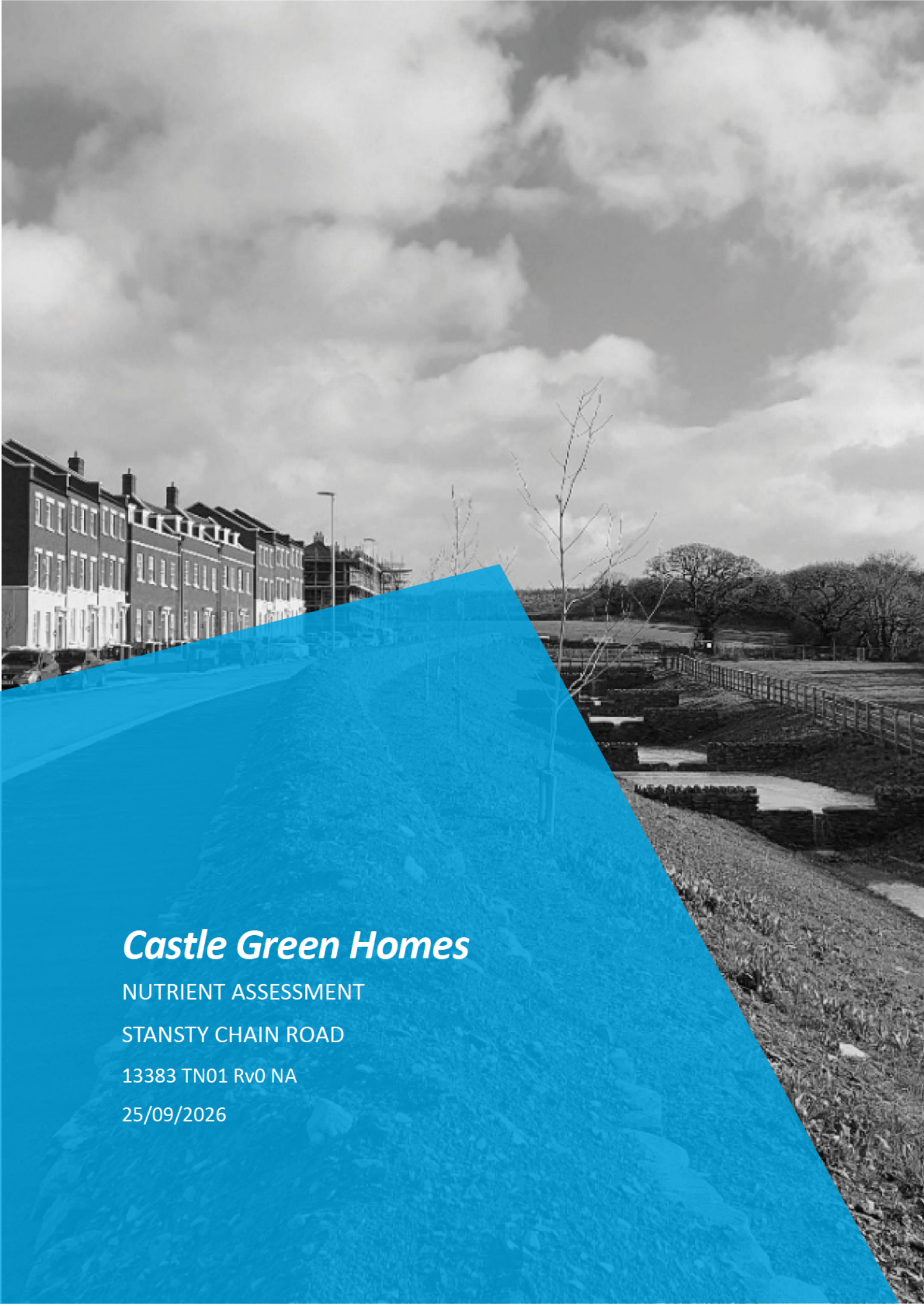


Castle Green Homes

NUTRIENT ASSESSMENT

STANSTY CHAIN ROAD

13383 TN01 Rv0 NA

25/09/2026

Document Status

Rev	Issue Status	Prepared	Checked	Approved
0	Final	LV	ES	DS

1 Executive Summary

1.1.1 Brookbanks has been appointed by Castle Green Homes to prepare a Nutrient Assessment for a proposed development of **455** dwellings at the Land either side of Stansty Chain Road ('the Site'). This assessment evaluates the Total Phosphorus (TP) budget produced by the proposed development.

1.1.2 In October 2025, Natural Resources Wales (NRW) published Version 5.1 of its Advice to planning authorities for planning applications affecting nutrient sensitive Special Areas of Conservation (SACs). This should be read alongside NRW's advice titled 'Principles of nutrient neutrality in relation to development or water discharge permit proposals' published in April 2025 and most recently updated in February 2026. Collectively, this guidance requires that new development must not contribute to further deterioration in water quality or undermine the ability of a SAC to meet its conservation objectives. While the guidance outlines achieving phosphorus targets within river SACs, it also provides advice on the nutrient impact upon Marine SACs. Accordingly, a nutrient assessment is necessary where development leads to increased phosphorus discharges either directly to, or within catchments draining to, marine SACs that are in unfavourable condition or where restoration efforts could be compromised.

1.1.3 The purpose of this report is to review evidence from both NRW, the governmental body within Wales, and the Environment Agency (EA), the governmental body within England, in relation to phosphate data collected within their Lowest common jurisdictive area or Reach of the River Dee.

1.1.4 When considering the EA data alongside NRWs dataset it is evident that the Lower Dee does not fail its phosphorus limit as set by NRW .Therefore, the understanding is that the Lower Dee currently passes its phosphorus limits and therefore nutrient neutrality mitigation is not required at this Site.

2 Introduction

2.1.1 The environmental targets for the rivers within designated SAC'S in Wales can be found within Core Management Plans (CMP's) which NRW are responsible for. CMP's are set out in the Joint Nature Conservation Committee Common Standards Monitoring (JNCC CSM) guidance[1].

2.1.2 The north of the River Dee is within England and is therefore within Natural England (NE) jurisdiction to ensure compliance with the Water Framework directive (WFD)[2] .NE do not consider the River Dee to be within a nutrient neutrality zone.

2.1.3 Areas highlighted by NRW regarding elevated phosphorus concentrations along the Dee are Pulford, Worthenbury and the Alyn Catchments. All of these catchments are within the vicinity of Wrexham as shown in **Figure 2-1**.

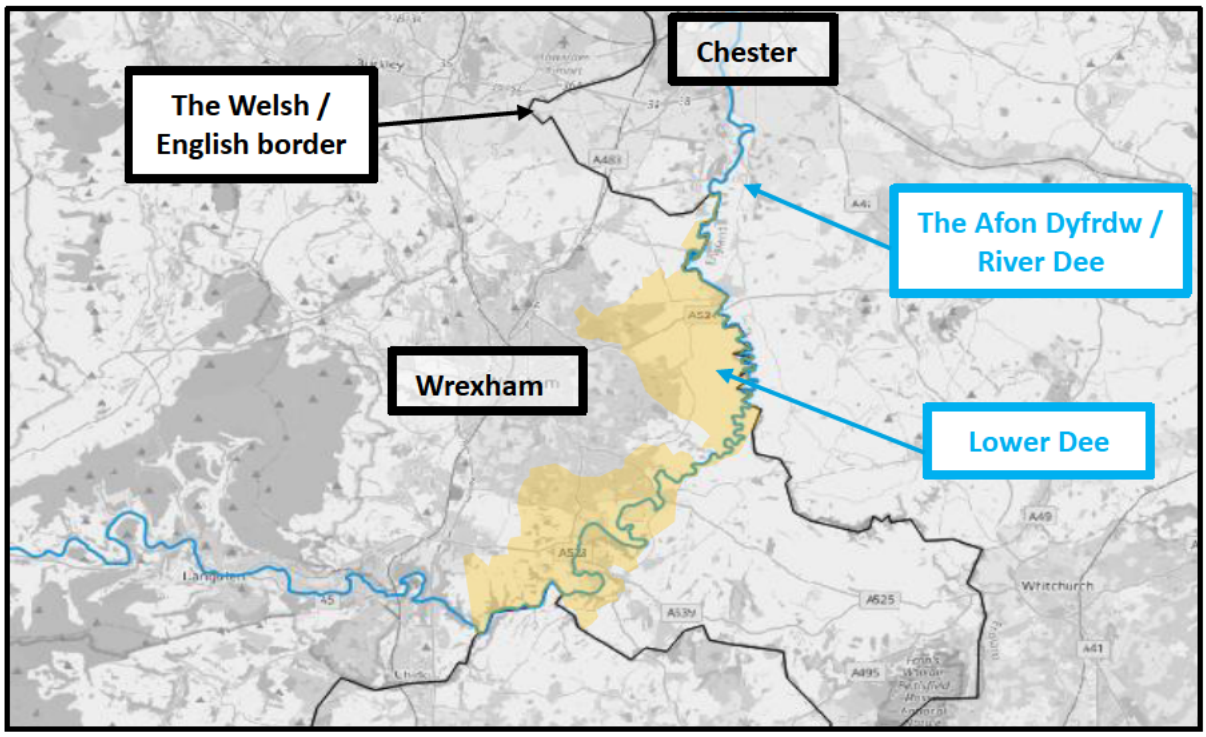


Figure 2-1 : The location of the River Dee in relation to the English/ Welsh border. The Lower Dee water body (GB111067057080) is within the area represented by the yellow hatch

2.1.4 **Figure 2-1** illustrates the location of the River Dee in relation to the English/Welsh border and identifies the extent of the Lower Dee water body (GB111067057080). As this is the specific water body identified by NRW as the exception to the wider River Dee and Bala Lake SAC catchment, the phosphorus status of this water body is the focus of the assessment.

[1] JNCC "Common Standards Monitoring guidance | Advisor to Government on Nature Conservation | JNCC"
[2] Gov.UK "The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017" The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

2.1.5 In early March of 2025 NRW released information that the Lower Reach of the River Dee and Bala Lake SAC now breached the target of 50 P µg l $^{-1}$ [3] . Within the NRW's "Principles of nutrient neutrality in relation to development of water discharge permit proposals" it is stated that nutrient neutrality is not required in relation to "The whole of the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC catchment, with the exception of water body GB111067057080 at the downstream end of the Dee. This affects Flintshire, Denbighshire, and Gwynedd County Councils; Wrexham and Conwy County Borough Councils and Snowdonia National Park Authority"[4] . Water body GB111067057080 is represented within **Figure 2-1** above and is the extent of the Lower Dee.

2.1.6 Therefore, per the failure of water body GB111067057080, Sites which drain into the catchment of the River Dee will need to evidence that they are nutrient neutral as all water within this catchment will have to drain through the Lower Dee which fails phosphorus limits.

2.1.7 NRW are currently actively working on the "LIFE" scheme[5] which aims restore the River Dee and its catchment. In relation to nutrient NRWs primary strategy is to improve agricultural and forestry land management practises to reduce the input of nutrients into the SAC.

2.1.8 The Dee and Western Wales river basin management plans 2021-2027 was produced by NRW in July 2022 to provide a framework for water management and aims to improve the current water environment.

[3] NRW "Assessment of water quality in Wales 2024" ,Natural Resources Wales / Assessment of water quality in Wales 2024
[4] NRW "Principles of nutrient neutrality in relation to development or water discharge permit proposals" , Natural Resources Wales / Principles of nutrient neutrality in relation to development or water discharge permit proposals
[5] Natural Resources Wales / LIFE Dee River

3 Development Context

3.1.1 The total Site covers circa **20.80 hectares (ha)** and is located either side of Stansty Chain Road, Wrexham. The Site is bound to the southwest by residential and commercial land, to the northwest by industrial land, and to the north and east by lowland grazing and a small area of open urban land.

3.1.2 The Site is located within Wrexham and is surrounded by agricultural use and associated building to the north and south, Stansty Chain road goes through the two parcels and the A483 borders the site to the east and Mold Road borders the Site to the west.

3.1.3 The Proposed Development comprises a total of **455** residential dwellings, with associated road, greenspace and LEAP areas.

3.1.4 **Figure 3-1** illustrates the Site's red line boundary.

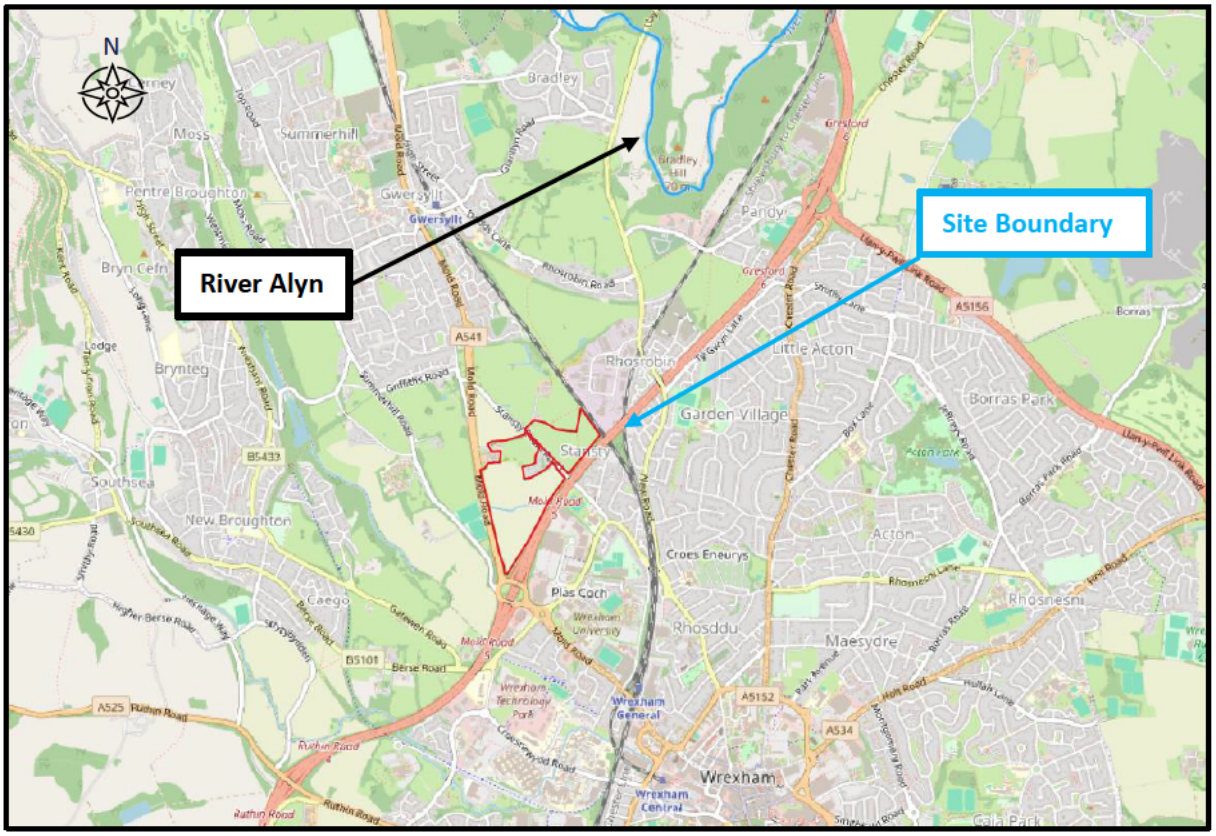


Figure 3-1 : Site Boundary

3.1.5 **Figure 3-2** illustrates the location of the Site in relation to the main rivers and Five Fords Wastewater Treatment Works (WwTW), which is approximately **5.0 km** southeast of the Site. It has been identified that the Site will pump foul water in a south easterly direction underneath the A483 towards the greater development of Wrexham, where the areas foul water is directed into the Five Fords WwTW.

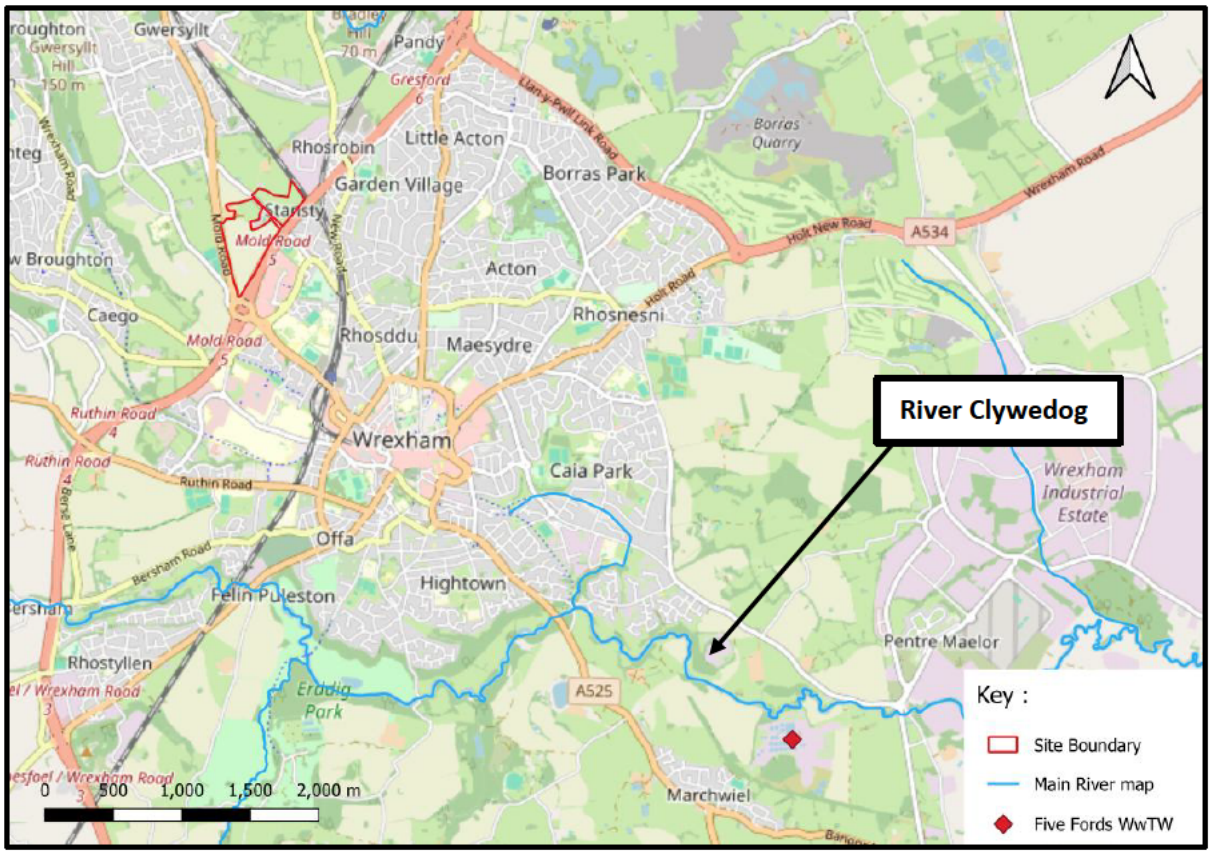


Figure 3-2: WwTW

4 Catchment Analysis

4.1.1 A catchment analysis has been undertaken to assess the hydrological and environmental context of the Site. The assessment establishes the baseline catchment characteristics and informs the Site's nutrient neutrality requirements.

4.1.2 The Site lies within the Clywedog Operational Catchment, it forms part of the Dee Management Catchment and the Dee River Basin District as defined by Natural Resources Wales under the Water Framework Directive (WFD). The catchment primarily drains toward the River Clywedog (Lower Dee), however it is assumed that foul water will be taken southeast to the Five Fords WwTW.

4.2 Drainage and Catchment Analysis

Surface Water

4.2.1 The surface water from the Clywedog operational catchment will eventually drain into the Dee Estuary.

4.2.2 The Site is hydrologically connected to the River Clywedog, which is a tributary of the River Dee. **Figure 4-1** illustrates the Site's location and surrounding topography, indicating a general decline in elevation towards the River Clywedog.

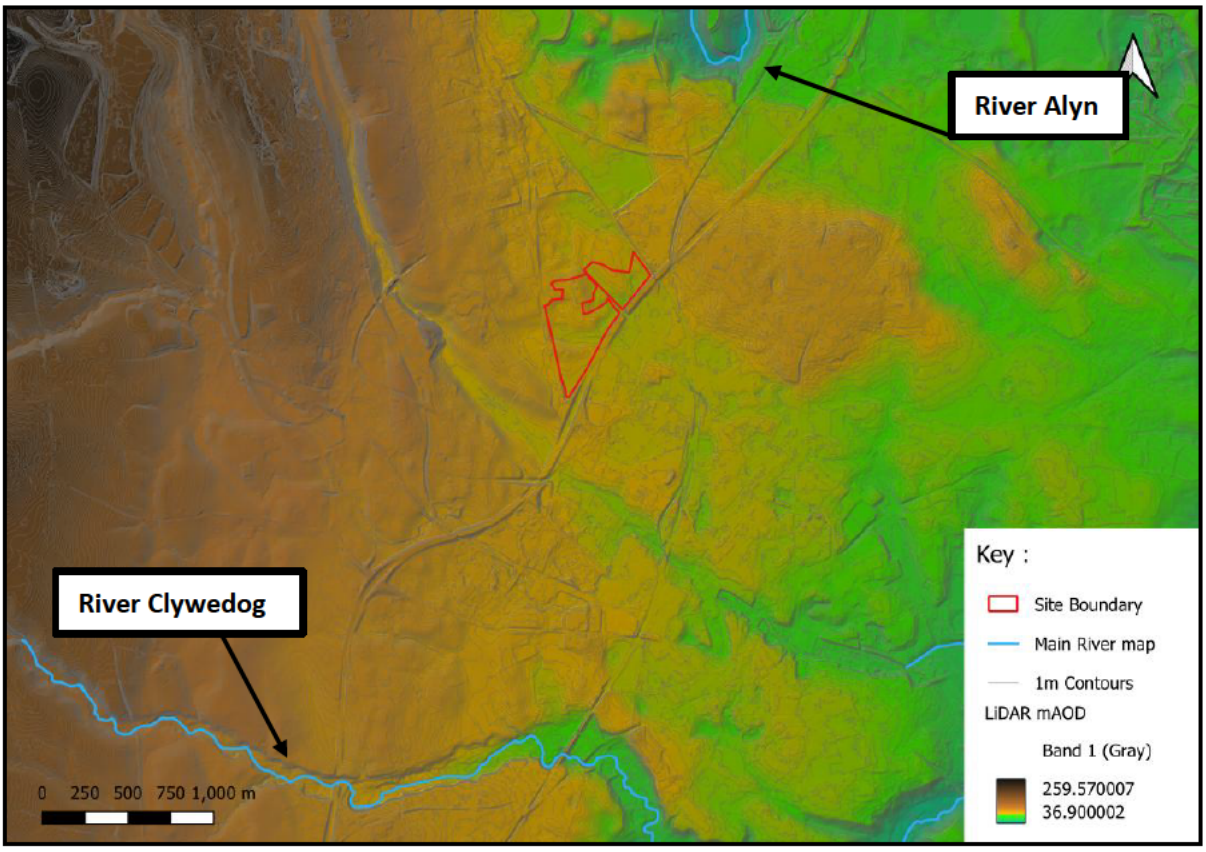


Figure 4-1 : LiDAR

4.2.3 The Site elevation ranges between circa **84 and 93 m AOD**. The east and south of the site has a lower elevation, whilst the northwest has higher elevation, continuing to climb outside of the site boundary.

Foul Water

4.2.4 Foul water from the proposed development is to be conveyed to and treated at Five Fords WwTW, which is located circa **5.0km** southeast of the Site. Foul water will be pumped via a pumping station to the nearest foul sewer connection along Stansty road to the south east of the Site.

4.2.5 Treated foul effluent from the WwTW is discharged into the River Clywedog (Lower Dee), which subsequently discharges into the Dee Estuary, an area within the River Dee and Bala Lake SAC.

4.2.6 The Sewerage Network is illustrated in **Figure 4-2** (where the Site is represented by the red line boundary). The Site currently does not have sewer connections; the nearest assets are within the existing development to the southeast.

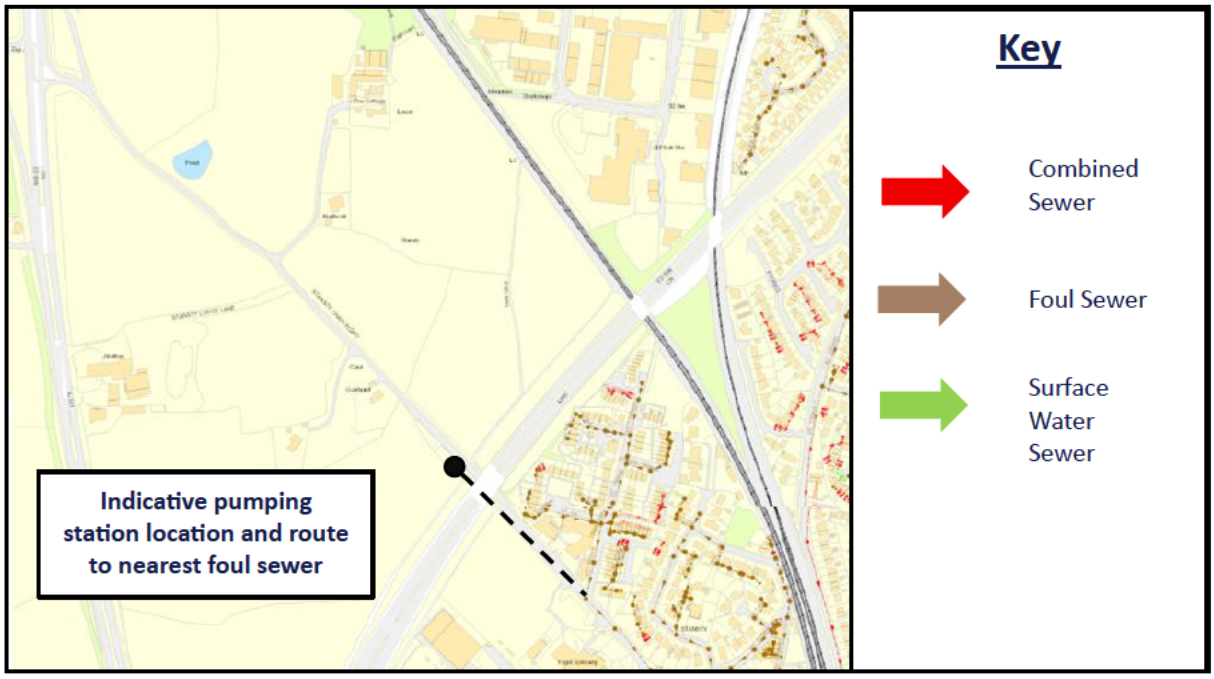


Figure 4-2 : DCWW Sewerage Network

5 Nutrient Budget Analysis

5.1 Nutrient Neutrality Calculator Methodology

5.1.1 This section applies a four-stage methodology using the All-Wales Nutrient Budget Calculator for SACs provided by NRW, most recently updated in February 2026, to assess the nutrient budget.

5.1.2 A review of the most recent guidance from NRW ensures a robust and up-to-date approach for accurately determining the TP budget for the Site.

5.1.3 NRW outline a practical methodology for calculating Nutrient Neutrality using the All-Wales Nutrient Budget Calculator, which now includes assessment parameters specific to the Burry Inlet Inner (NRW, 2026). The four-stage process encompasses the following steps:

5.1.3.1 Stage 1: Calculating wastewater nutrient load from The Site

- Calculating additional population
- Wastewater Volume
- Waste Water Treatment Works (WwTW)
- Applying a deduction of nutrient loading
- Nutrient load discharged from the WwTW

5.1.3.2 Stage 2: Calculating nutrient load from current land use

- Calculate the total existing agricultural land
- Confirmation and calculation of nutrient loss

5.1.3.3 Stage 3: Calculating the adjusted nutrient load to account for the future land uses

- Calculation of nutrient load from proposed future land uses
- Combine the nutrient load from the proposed future land uses

5.1.3.4 Stage 3S: Calculating nutrient load removed through SuDS

- Calculation of nutrient load removed from the application of SuDS in proposed future land uses

5.1.3.5 Stage 4: Total nutrient load budget

- Calculate net change in nutrients from land use changes
- Determine the nutrient budget
- Add 20% if the nutrient budget is positive

Calculation Assumptions		
Special Area of Conservation (SAC)	River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid	
Postcode	LL11 4YH	
Local Planning Authority (LPA)	Wrexham County Borough Council	
Project Type	Residential	
Number of dwellings	455	Residential dwellings
Average Occupancy	2.33	Persons per dwelling (Based on the selection on the All-Wales Nutrient Neutrality Calculator)
Water Usage	120	Litres per person per day
Current Land Use	20.80	Ha – Lowland grazing (Based on historical aerial imagery)
Future Land Use	14.97	Ha – Residential
	0.19	Ha – Water
	0.04	Ha – Open Land Built Environment
	5.60	Ha – Greenspace
Wastewater Treatment Works	Five Fords WwTW	
Current Phosphorous Permit Limit	1	mgTP/l
Average Annual Rainfall	823	mm
Soil Type	Freely Draining - Freely draining slightly acid loamy soils (NSRI, 2026) (LandIS, 2026)	

Table 5-1 : Calculation Assumptions

5.2 All-Wales Calculator

5.2.1 The Site assumptions used in the nutrient budget calculations are shown in **Table 5-1.**

5.2.2 NRW guidance released in May 2025; "Nutrient Budget Calculator Guidance" suggest that a buffer of 10l/p/day is built onto the national average water consumption limit of 110l/p/day in order to account for changes to less efficient fittings throughout the lifetime of the development. Therefore, water consumption is anticipated to be at 120l/p/day. This figure is applied in these calculations.

5.2.3 Based on historical aerial imagery, the Site is currently predominantly used as lowland grazing land.

5.2.4 Data from the National River Flow Archive, indicates an average annual rainfall of approximately 823 mm.

5.3 SuDS Approving Body

5.3.1 The proposed surface water drainage for the Site will need to be in accordance with SuDS Approving Body (SAB) requirements and is assumed to follow a SAB-compliant treatment train. In line with CIRIA guidance 'Using SuDS to reduce Phosphorus in surface water runoff (C815F)', such a treatment train would typically comprise a combination of source control, site control, and regional control measures to manage both water quality and quantity prior to discharge.

5.3.2 SuDS features designed within the development has the potential to remove TP from the surface water runoff. The removal of 30% is in line with the accepted standard of nutrient removal by SuDS treatment trains designed within the drainage strategy as outlined within CIRIA C815F guidance but more detailed calculations to demonstrate the removal of further TP could be acceptable to NRW. For the purposes of this report, a 30% reduction has been applied to the TP load from urban runoff within the nutrient budget calculations for this assessment.

5.4 Nutrient Budget Assessment

5.4.1 Based on the assumptions outlined in **Table 5-1** and in accordance with NRW's nutrient neutrality methodology (NRW, 2025), **Table 5-2** illustrates a summary of the nutrient budget using the All-Wales Calculator. The detailed calculations supporting these outputs are provided in **Appendix B**.

Nutrient Budget Calculator for SACs in Wales		Current (kgTP/year)	Explanation
1	**Additional nutrient loading from wastewater**	**46.47**	Current Permit Limit (N): 1.0mgTP/l
2	**Nutrient loading from pre-existing landcovers**	**2.70**	Lowland grazing: 0.13kgTP/ha/year*
3	Nutrient loading from new landcovers	24.85	Residential urban: 1.67 kgTP/ha/year* Greenspace: 0.02 kgTP/ha/year* Water: 0.00 kgTP/ha/year* Open land – Built Environment: 0.90kgTP/ha/year*
	Nutrient Load removed by SuDS (30%)	7.41	Assumed 30% SuDS reduction applied to residential surface water run off
	Nutrient loading from new landcovers – Nutrient load removed by SuDS	**17.44**	Remaining future nutrient load inclusive of 30% SuDS reduction
4	**Final nutrient budget (+20% if positive)**	**73.45**	**kgTP/year** **Stage 1 + (Stage 3 – Stage 2) + 20%**

Table 5-2 : TP Budget *Leachate rates in accordance with All Wales Nutrient Neutrality Calculator.

5.4.2 The Site would therefore produce a TP budget of **73.45 kgTP/year.**

6 River Dee Lower Reach Assessment

6.1.1 The table below provides an extract from the Compliance Assessment 2021 and shows that "Site ID 671" which is located within the Lower Dee was complaint with the phosphate limit in 2021.

Waterbody ID	Waterbody Name	Site	Target (µg l^{-1})	N Samples	Annual Mean (µg l^{-1})	Growing Season Mean (µg l^{-1})	Result	Status
GB111067051990	Mynach	300	10	19	25	27	Fail	Confirmed
GB111067051900	Tryweryn - Dee to Mynach	294	10	25	10	4	Pass	-
GB111067051960	Meloch	496	10	19	20	9	Fail	Unconfirmed
GB111067052240	Dee - Alwen to Llyn Tegid/ Bala Lake	1	10	27	7	4	Pass	-
GB111067052060	Dee - Ceiriog to Alwen	70	10	31	15	16	Fail	Confirmed
GB111067051610	Ceiriog - upstream of Teirw	-	28	No data			Not Assessed	-
GB111067051910	Ceiriog - confluence Dee to Teirw	578	28	31	22	26	Pass	-
GB111067057080	Dee - Chester Weir to Ceiriog	87, 671, 689	50	60	15, 50, 47	17, 46, 49	Pass	-

Table 2. Phosphorus Compliance for the River Dee SAC. All orthophosphate concentrations are in µg l^{-1}.

Figure 6-1 : Extract from Table 2 of the Compliance Assessment 2021

6.1.2 In early March of 2025 NRW released data that showed that this lower reach of the River Dee and Bala Lake SAC now breached the target of 50 P µg l $^{-1}$ [6] as set by NRW and therefore was considered to Fail phosphate limits, despite a 2021 revision of the Compliance assessment stating the Lower Reach of the Dee passed[7].

6.1.3 In a recent appeal case (APP/H6955/A/3263616[8]) NRW stated that a development Site was to be delayed citing a primary reason for this delay being the production of nutrients from the anticipated wastewater generated from the Site. This was based on the fact that the Lower reach of the Dee was considered a sensitive catchment to nutrients. Within that Appeal process NRW did not object to the use of EA data within the assessment nor did they have any adverse comments on the conclusions within the assessment demonstrating that the Lower Dee did in fact pass phosphorus limits. This assessment was provided by Brookbanks on behalf of the appellant.

6.1.4 In May 2026 following the above appeal, Brookbanks were approached by Wrexham council to produce a standalone paper. Within the paper evidence was provided that shows the combined data / sampling of NRW and the EA demonstrates that the Lower Dee does not breach the phosphorus limit as set by NRW.

[6] NRW "Compliance Assessment of Welsh River Special Areas of Conservation (SACs) Against Water Quality Targets (2020 - 2023)" New map | DataMapWales

[7] Natural Resources Wales (January) "Compliance Assessment of Welsh River SACs against Phosphorus Targets " compliance-assessment-of-welsh-sacs-against-phosphorus-targets-final-v10.pdf

[8] Wrexham County Borough Council (2025) "Planning Appeal APP/H6955/A/20/326316 (WCBC) ref. no. P/2019/0005) – Land south of Holt Road Wrexham " https://moderngov.wrexham.gov.uk/mgConvert2PDF.aspx?ID=38799

6.1.5 Further to this in July 2026 a Wrexham Borough council planning committee report was created. This report summarises that NRW did indicate that the Lower Dee exceeded the phosphorus target of 50 µg l^{-1}, however NRW assigned a Low confidence rating to that assessment. This rating was heavily influenced by the outlier within the data, which NRW still consider technically valid and therefore is still included within their data analysis. This document then references the Brookbanks report which considered both the NRW and EA data , which did show that within this parameters the Lower Dee should not be considered to be at risk of failing its phosphorus target. Counsel advice was sought on how the data can be used to influence decision making. The legal advice concluded that the council can lawfully rely on the combined EA and NRW data rather than the standalone NRW data. Counsel noted that the council may make its own judgment under the Habitat Regulations and is not legally bound to accept NRW's interpretation of the data. The council can lawfully proceed on the basis that the Lower Dee is not failing phosphorus targets because the combined EA/NRW data provided a stronger and more proportionate evidential base for decision making. However the council must still justify this position and give proper weight to the NRW evidence. It was stated that :

"With this study and legal advice, it can be concluded that a proposal within the lower Dee catchment does not adversely affect the integrity of the River Dee and Bala Lake SAC, even with a net increase in phosphorus."

6.1.6 NRW has been consulted on a draft version of the evidence report and did not challenge the substantiative arguments and conclusions that the waterbody can be considered to be passing in light of EA data, and they conceded that EA data can be considered for a future review. They therefore acknowledge this low confidence and hence they did not require nutrient neutrality as their policy within the Lower dee , leaving this discretion to the local planning authority.

6.1.7 Within the Brookbanks evidence paper, it was noted that NRW had 13 results over 3 years (2021-2023) recorded for phosphate limits within this reach of the River Dee. This limited dataset did include extreme outliers which can lead to results that are outside the scope of what was originally envisaged when the statistical analysis parameters were set. The EA utilise the same monitoring location and methodologies for phosphate recording and data analysis and had a dataset of 36 across the same time period as NRW and had a total of 97 datasets recorded between 2018 and 2026.

6.1.8 The EA's dataset utilises the same analysis criteria as NRW, however the EA data, when considered under the same criteria as NRW's data, demonstrated that this reach of the River Dee is under the phosphate limit of 50 P µg l^{-1} and therefore should not be considered as an area vulnerable to nutrients.

6.1.9 **Table 6-1** below shows the EA data from 2018 to 2026.

Year	Number of results for Year	Yearly Average µg l	Growing Season Average µg l	Pass / Fail	Remarks
2018	12	34	38	Pass	-
2019	13	35	39	Pass	-
2020	3	29	29	Pass	Based on only 3 results
2021	10	31	30	Pass	Growing season results only 5 results
2022	15	27	28	Pass	-

2023	11	37	39	Pass	-
2024	15	39	30	Pass	-
2025	14	41	30	Pass	-
2026	4	24	15	Pass	Based on only 4 results and 2 growing season available

Table 6-1 : Environment Agency River Dee average phosphate concentration results for 2018 to 2026

6.1.10 As can be seen the results above show that the average recorded phosphate for each year never breaches the 50 P µg l $^{-1}$ limit, meaning that from these results this reach of the River Dee and Bala Lake SAC remains below the NRWs designated limit for failure.

6.1.11 To analyse the data presented by the EA the raw data was placed into a box and whisker chart in relation to the years the data was collected, from 2018 to 2026 (**Figure 6-2**). As seen by that data in **Figure 6-2** the interquartile range ,as represented by the extent of the box plot, across all years is consistently below the 50 P µg l $^{-1}$ phosphate limit excluding 2025 where the extreme outlier is present.

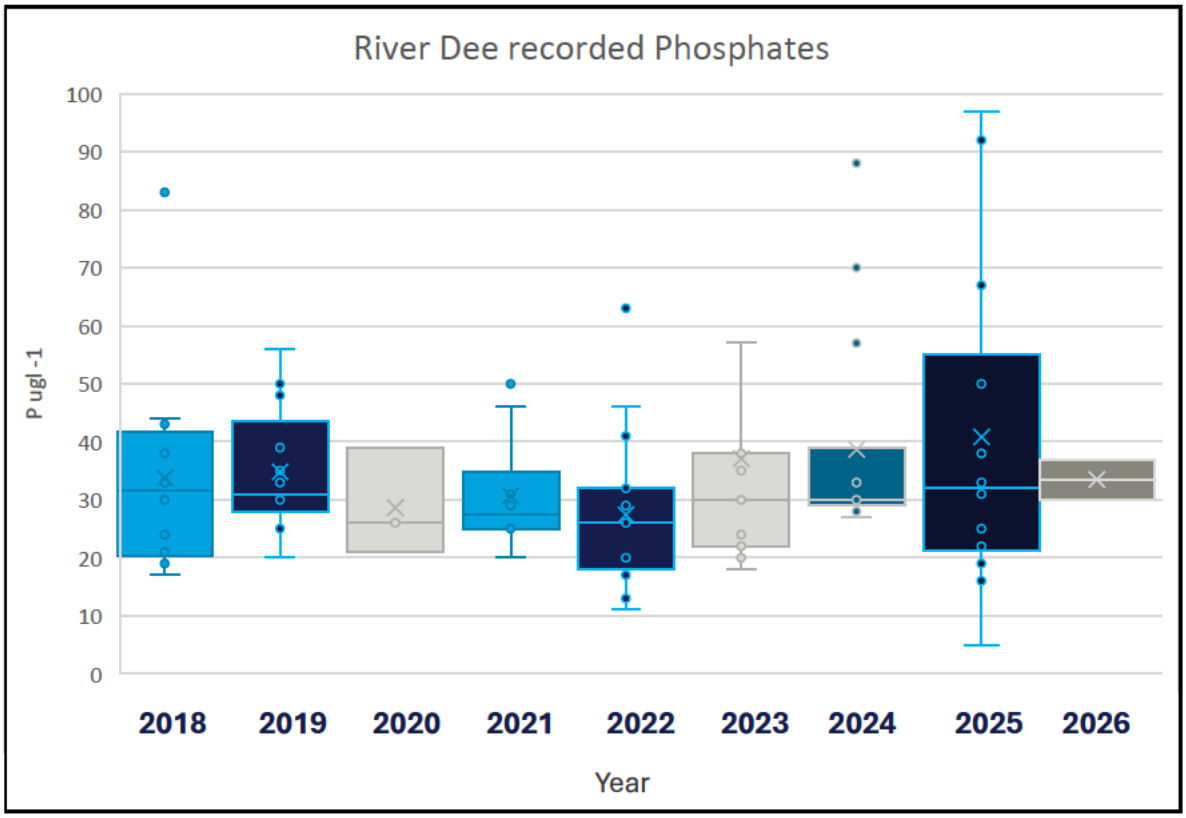


Figure 6-2 : EA raw phosphate data results placed within a box and whisker chart, the 50 P µg l $^{-1}$ limit is represented by the red line

6.1.12 The median of this data, as represented by the midline within the boxplots, was calculated accommodating all data collected across the 7 year period, this median was 30 µg l significantly below the 50 P µg l $^{-1}$ phosphate limit

6.1.13 NRW data from 2021-2023 did show that the Lower reach of the Dee failed its phosphorus limits however this did include major statistical outliers including a result that was ten times the amount of the average phosphorus amount detected and three times the amount than the average outlier. As the EA and NRW utilise the same methodologies their results are comparable therefore the data from 2021 to 2023 was combined for both the EA and NRW .It can be observed in **Figure 6-3** that when this data is combined, even with the spurious outlier, the River Dee remains well below the required 50 P ugl $^{-1}$ limit at an average of 39 P ugl $^{-1}$.

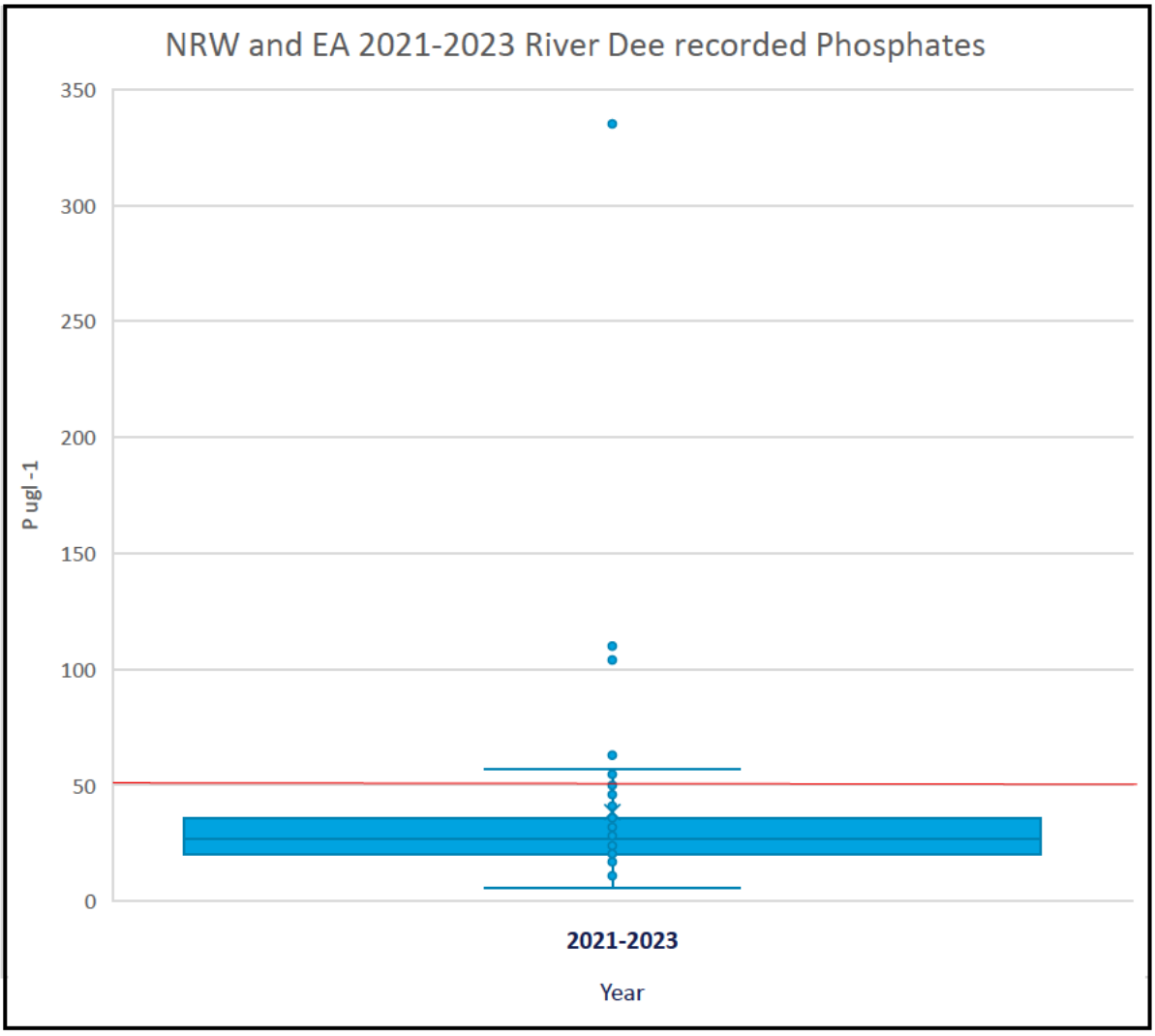


Figure 6-3 : EA and NRW raw phosphate data results from 2021 - 2023 placed within a box and whisker chart, the 50 P µg l $^{-1}$ limit is represented by the red line

6.1.14 Based on the evidence presented within this report, the lower reach of the River Dee, common to both the jurisdiction of the NRW and EA, is not at risk of pollution from phosphates. Considering evidence provided from the EA in relation to the assessment methods related to planning, the Habitat Regulations and NRW advice.

6.1.15 The average phosphorus level when considering both EA and NRW results is 39 P ugl $^{-1}$, this is including the spurious outlier, which NRW did acknowledge would require investigation. When acknowledging this spurious outlier a headroom of 11 P ugl $^{-1}$ is the available headroom from the phosphate limit of 50 P ugl $^{-1}$ this equates to 0.011 mg/l.

6.1.16 To understand what this headroom looks like in relation to kilograms of phosphorus per day we can utilise NRW's own publication, the regulation leaflet "The Dee Regulation Scheme in a nutshell[9]" which states that the natural average flow from the Dee in the lower reach is around 36.8m^3/s from a catchment of 1816km^2. Therefore, it can be calculated that the 0.011mg/l would equate to 34.97kg of phosphorus a day.

6.1.17 To calculate the predicted phosphorus load of the proposed development the calculation assumptions in **Table 5-1** will be utilised. To calculate the phosphorus, load the dwelling number which is 455 will be multiplied by the, occupancy rate which is 2.33, this gives us an estimated new population, if you were to then multiple this figure by the average water usage per person per day which is 120 it is 127,218 litres, therefore it is assumed that the proposed development will use 127m^3/day.

6.1.18 Using the final effluent concentration from the NRW Response as 1mg/l, this equates to 0.127kg/day. To put that into context, those 455 homes would account for 0.36% of the observed swing of 11 P ugl $^{-1}$ needed to breach the 50 P ugl $^{-1}$ phosphorus limit ,meaning that 125,000 homes would need to be built to overtake this available headroom. Given that Five Fords WwTW only serves 130,000 people, rather than homes, even doubling the flow from Five Fords would be unlikely to result in a consistent increase and in turn bring the Lower Dee into failure.

6.1.19 Per the above calculations it can be stated that the development has no significant impact on the phosphorus concentrations within the Lower Dee and is therefore permissible in terms of the required 50 P ugl $^{-1}$ limit for phosphorus.

6.1.20 In 2030 planned improvement to Five Fords will ensure they meet an new Phosphorus limit of 0.7mg/l effective from 31/03/2030. This is an improvement of 30% and demonstrates how the concentration of phosphorus within the Dee will decrease as time goes on meaning the headroom available will only increase.

[9] river dee regulation leaflet

7 Conclusion and Recommendations

7.1 Summary

7.1.1 This Nutrient Assessment has set out an appraisal of the TP budget associated with the proposed residential development of 455 dwellings at the Stansty Chain Road undertaken in accordance with the most recent NRW nutrient neutrality guidance and the All-Wales Nutrient Budget Calculator (NRW, 2025).

7.1.2 This Site lies within the Dee catchment. The assessment confirms that both surface water runoff and treated foul effluent from the Site are hydrologically connected to the River Dee Estuary, however surface water runoff drains to the River Clywedog (Lower Dee) whilst the foul water drains to the Five Fords WwTW with treated effluent discharging to the River Clywedog and subsequently the River Dee.

7.1.3 The nutrient budget calculations identify a net increase in TP loading as a result of the proposed change in land use. Under current WwTW permit conditions **(1 mgTP/l)**, the development would generate a TP budget of **73.45 kgTP/year**. These outputs are summarised in **Table 7-1**.

The Site: Stansty Chain Road	Current WwTW Phosphorus Permit Limit
455 dwellings	**73.45 kgTP/year**

Table 7-1 : Summary of Nutrient Budgets

7.1.4 The assessment has incorporated reasonable avoidance and reduction measures at the scheme design stage, including SAB-compliant SuDS with an assumed 30% TP reduction from surface water runoff. Notwithstanding these measures, a residual TP budget remains.

7.1.5 NRW are actively using strategies to tackle phosphorus sources inputting into the River Dee. These strategies include but are not limited to improving agricultural practises within the area which input a large quantity of the phosphorus input into the Dee. Ongoing work by NRW and Welsh Water will show a likely decrease in the concentration on phosphorus into the Dee and therefore the observed headroom mentioned within this report of 11 P ugl $^{-1}$ will likely increase. This is evidenced by the planned improvements to Five Fords WwTW which will see the current permit limit reduce by 30% in 2030.

8 Disclaimer

8.1.1 The conclusions and recommendations contained herein are limited to those given the general availability of background information and the planned usage of the site.

8.1.2 Third party information has been used in the preparation of this report, which Brookbanks, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks accepts no liability for same.

8.1.3 The benefits of this report are provided solely to Castle Green Homes for the proposed development at Stansty Chain Road only.

8.1.4 Brookbanks excludes third party rights for the information contained in the report.

Appendix A – NRW interim guidance

Cyfoeth Naturiol Cymru
Natural Resources Wales

25 July 2025

Dear Chief Planning Officer,

Following the publication of the conservation (Regulation 37) advice packages and condition assessments for marine protected areas on the 25th June, we are able to provide updated interim advice for Planning Authorities. We appreciate the significant challenges and the complexities surrounding this work, and we continue to develop a proportionate approach to provide the desired outcomes for the environment and to help support sustainable development.

The condition assessments showed that the nutrient sensitive features in Pembrokeshire Marine, Carmarthen Bay and Estuaries and Cemlyn Bay Special Areas of Conservation (SAC) areas are in unfavourable condition for Dissolved Inorganic Nitrogen and biological indicators (phytoplankton and opportunistic macroalgae) related to nutrient enrichment. Water bodies in marine SACs where features are in unfavourable condition due to current evidence of both chemical and biological failure are:

- Milford Haven Inner (Pembrokeshire Marine SAC)
- Burry Inlet Inner (Carmarthen Bay and Estuaries SAC)
- Cemlyn Lagoon (Cemlyn Bay SAC)

A map outlining the freshwater catchments that drain to the marine SACs is included in Annex 1, attached to the letter. A GIS layer showing all the catchments draining to the nutrient sensitive marine designated sites will be available shortly and can be circulated on request.

The interim advice for Planning Authorities is included in this letter. This will be published on our SAC advice to Planning Authorities web page shortly, but we wanted to provide the advice as soon as it became available. We advise Planning Authorities that a conclusion of no adverse effect on site integrity may be drawn in a Habitats Regulations Assessment, where any plans or projects in the areas outlined with the potential to increase nutrient discharges can secure appropriate mitigation and demonstrate nutrient neutrality for nitrogen.

Further technical work to understand the nutrient impacts and ongoing environmental monitoring and assessment of chemical and biological failures geographically will help to inform any future revisions to the planning advice.

We will continue to liaise and set up further meetings with the Planning Authorities who will need to give detailed consideration to this advice in their planning area.

Should you require anything further at this point, please let me know or send any queries to sacnutrientsenquiries@cyfoethnaturiolcymru.gov.uk.

Yours sincerely,

[redacted]

Ruth Jenkins

Pennaeth Datblygiadau Cynllunio a Morol / Head of Development Planning and Marine

Interim Advice to Planning Authorities

Our marine SACs have a number of ecological features designated for environmental protection including estuaries, coastal lagoons, large shallow inlets and bays and mudflats/sandflats that are sensitive to high levels of nutrients.

We released condition assessments Natural Resources Wales / Condition assessments for Welsh European marine sites (EMS) and conservation advice Natural Resources Wales / Conservation advice for European marine sites (Reg 37) for our marine SACs in June 2025.

The updated condition assessments have concluded that nutrient sensitive features at some sites are in unfavourable condition for both chemical (Dissolved Inorganic Nitrogen [DIN]) and biological (phytoplankton and opportunistic macroalgae) indicators of nitrogen enrichment. High concentrations of nitrogen in the water column at these features can cause phytoplankton and opportunistic macroalgae blooms leading to adverse ecological effects. These effects include reduced dissolved oxygen availability, especially in warmer months, and lethal and sub-lethal impacts on sensitive fish, epifauna and infauna communities.

Water bodies in marine SACs where features are in unfavourable condition due to current evidence of both chemical and biological failure are:

- Milford Haven Inner (Pembrokeshire Marine SAC)
- Burry Inlet Inner (Carmarthen Bay and Estuaries SAC)
- Cemlyn Lagoon (Cemlyn Bay SAC)

Further technical work to understand the nutrient impacts and ongoing environmental monitoring and assessment of chemical and biological failures geographically will help to inform any future revisions to the planning advice.

New developments leading to an increase in nitrogen discharges directly to, or catchments draining to these sites may contribute to unfavourable condition of, or undermine measures to restore these features. We therefore advise Planning Authorities that a conclusion of no adverse effect on site integrity may be drawn in a Habitats Regulations Assessment, where any plans or projects in these areas with the potential to increase nutrient discharges can secure appropriate mitigation and demonstrate nutrient neutrality for nitrogen.

Planning Authorities may apply the screening principles set out in our SAC Rivers planning advice for types of development unlikely to increase nutrient discharges and advice on agricultural developments, domestic extensions, private treatment systems, separator toilets and permitted development.

Where the intention is for a proposed development to connect to a sewer network that is located close to the boundary of the freshwater catchments for the Milford Haven Inner, Burry Inlet Inner, and Cemlyn Lagoon, the location of wastewater treatment outfall should be confirmed to determine if there is a hydrological pathway for nutrient discharges to the failing marine water body.

Appendix B– Nutrient Calculations (All Wales Nutrient Budget Calculator)

Nutrient Budget Calculator for Special Areas of Conservation (SACs) in Wales

This calculator was created by Ricardo Energy and Environment and Arup for Welsh Government.

This is the English version of the calculator. This calculator is also available in Welsh/Cymraeg.

This calculator contains 6 worksheets with 11 tables in total.

This is the instructions cover sheet. It tells you how to use the calculator and gives an overview of each worksheet.

You can move between worksheets using the tabs at the bottom of the page.

If you use screen reading software, you can use 'Ctrl' + 'Page Down' keys to move between the tabs.

If you use a keyboard only, to open any link in this cover sheet first select the cell with the link and then press the 'Shift' + 'F10' keys or the 'Fn' + the 'Menu' keys, then press the letter 'O' twice to highlight 'Open Hyperlink' and press 'Enter'.

If you use a keyboard only, access dropdown lists by clicking the dropdown arrow or pressing the 'Alt' + 'Down' keys when the cell is selected.

Table of Contents

Topic of each worksheet	Link to each worksheet
Stage 1: additional nutrient loading from wastewater	Stage 1: additional nutrient loading from wastewater
Stage 2: nutrient loading from pre-existing landcovers	Stage 2: nutrient loading from pre-existing landcovers
Stage 3: nutrient loading from new landcovers	Stage 3: nutrient loading from new landcovers
Stage 3S: nutrient load removed through sustainable urban drainage systems (SuDS)	Stage 3S: nutrient load removed through SuDS
Stage 4: final nutrient budget calculation	Stage 4: final nutrient budget calculation

General information about the calculator

This calculator helps you calculate a nutrient budget for a new development within one of the nine Special Areas of Conservation (SACs) within Wales.

The development categories include: residential; commercial; tourism; leisure and public service infrastructure. The planning permission use classes have been categorised into each development category. These can be found in the guidance that accompanies this calculator.

The nutrient budget for a site is calculated in 4 key stages with an additional optional stage in which information about the SuDS features on the site can be entered. Each stage is implemented in worksheets 2 to 6 of this calculator.

The instructions for completing each stage of the nutrient budget methodology are shown in cell A2 of each worksheet. Additional instructions may also be in cell A3.

Each worksheet is connected through a set of formulas which calculate the final nutrient budget. The formulas use a set of lookup tables to find relevant values to determine the nutrient loading at each stage.

Before a nutrient budget can be completed using the methodology, certain site-specific details for the development site need to be determined and entered into Stage 1, Stage 2, Stage 3, and Stage 3S (if applicable).

The total phosphorus (TP) budget and total nitrogen (TN) generated is calculated automatically once all required inputs have been entered into Stage 1, Stage 2, Stage 3, and Stage 3S (if applicable). The calculation involves adding the values from Stage 1 and the result of Stage 3 subtract Stage 3S (if applicable), and then subtracting the values from the Stage 2. A 20% precautionary buffer is then added to the result. This calculation is completed automatically in the Stage 4 worksheet. This equation can be summarised as:

(Stage 1 - Stage 2 + (Stage 3 - Stage 3S)) * 1.2 = Stage 4

The pre-populated values in this calculator have been identified through extensive research and modelling. The values are based on the best available evidence and are suitably precautionary to account for any uncertainty. This nutrient budget calculator can be used as supporting evidence for a Habitat Regulations Assessment (HRA). Specifically, this calculator can be used within an appropriate assessment to assess the likely significant effects of a proposal on the integrity of the site and its conservation objectives. It is highly unadvisable to edit the values in this tool without a sufficient evidence base to justify any changes.

When using this tool, it is recommended that you save a new copy of this workbook for each nutrient budget calculation, in order to retain a default blank copy. It may also be useful to open two calculators with one showing the instructions and one showing the calculator.

Notes on Stage 1: additional nutrient loading from wastewater

The Stage 1 Worksheet contains 2 tables that are used to calculate the nutrient load associated with the additional wastewater generated as a result of the development.

The first table under the heading 'Wastewater load input data' requires you to enter key information about the development and the water infrastructure. This table contains a mix of user inputs and values that are calculated automatically depending on the user inputs.

The first table contains a postcode search function that allows you to find the appropriate LPA and the rainfall for the site if a valid postcode is entered that is within the SAC catchment. Entering the postcode for the site, or the nearest postcode, will generate site specific information. This automatically generated information can be used instead of manually entering the relevant data. However it is your responsibility to confirm this information is correct.

The amount of wastewater generated needs to be calculated using the following:
- the SAC relevant to the development
- project type (residential, commercial, tourism, public service infrastructure or leisure)
- number of additional dwellings/units being created
- the local planning authority (LPA)
- an average occupancy rate (if applicable)
- number of people/customers/employees per unit
- a per capita water usage figure per person/customer/employee
- the number of customers/users & employees (if applicable)
- the percentage of customers/users & employees from outside the catchment (if applicable)
- the water usage per customer/user (if applicable)

You must select the Special Area of Conservation (SAC) for the calculator to function correctly.

You must select the project type because it determines which inputs are required to calculate the amount of wastewater generated. The project types are representative of the planning permission uses classes. The appropriate project type for each planning permission use class can be found in the guidance that accompanies this calculator.

The average occupancy rate for residential developments is dependent on the postcode entered or the LPA selected. The default water usage values is preset in the worksheet. The default setting for the average occupancy rate is preset in the worksheet and automatically generated dependant on the LPA. You can change this value if there is sufficient evidence that the development will be different to the national average. The per capita water usage is also present in the worksheet, this value should remain unchanged unless other efficiency measures are used. The number of new developments is not preset and must be a whole number.

You must select the wastewater treatment works (WwTW) that will receive the wastewater from the development. If you are unsure which WwTW will receive the wastewater, please obtain this information from Dwr Cymru/Welsh Water in order to complete this calculator. If connecting to a sewerage network is unfeasible and a septic tank or package treatment plant is being used, please select the appropriate option.

The WwTW are correct at the time of publication but may be subject to change in the future. If required, these values will be updated at a later date accordingly.
If you are using a septic tank or package treatment plant and the total nitrogen (TN) or total phosphorus (TP) final effluent concentrations are specified by the manufacturer, select 'Septic Tank user defined' or 'Package Treatment Plant user defined' and enter the manufacturer specified value in the cell where prompted (in mg/l).
The second table under the heading 'Final calculation of nutrient load from wastewater' contains the calculation of the nutrient load from additional wastewater generated by the development.
Notes on Stage 2: nutrient loading from pre-existing landcovers
The Stage 2 Worksheet contains 2 tables that are used for calculating the annual nutrient load from existing (pre-development) landcovers within the redline boundary of the development.
The first table under the heading 'Physical characteristics' requires user inputs. You must select the predominant soil drainage present within the redline boundary of the site. The rainfall value will be automatically generated if the user has entered a valid postcode in 'Stage 1'. You must select whether the rainfall value is correct. If the rainfall value is not correct, or if a valid postcode has not been entered, you must select the rainfall value from the dropdown list. The sources of the soil drainage type and the rainfall can be found in the table under the heading 'Sources of information required for Stage 2' that follows this text.
The second table under the heading 'Pre-existing landcovers' requires user inputs. You must select the most appropriate landcovers from a dropdown list of 18 landcover types to represent the landcover present on the site before the development. You must also enter the area of each landcover in hectares. The dropdown list contains 10 agricultural landcover types and 8 non-agricultural landcover types to represent the landcovers present on the site before development. The descriptions of each landcover type can be found in the guidance that accompanies this calculator. You must determine which landcover types are present within the redline boundary of the development before completing this tool. If there is a landcover within the development area that is not in the dropdown list please select the most similar landcover type.
Sources of information required for Stage 2

Description of information	Link to source of information
Soil drainage: The drainage associated with the predominant soil type within the development site can be found using the Soilscapes Map.	Soilscapes
Rainfall: The annual average rainfall that the development will receive can be found using the National River Flow Archive. You must first select any flow gauging station. You must navigate to the 'Catchment info' tab and select the spatial data type to view as 'Rainfall'. You can scroll around this map to find your development. Clicking the link will take the user to the 'Usk at Chainbridge' station.	National River Flow Archive (Usk at Chainbridge)

Notes on Stage 3: nutrient loading from new landcovers
The Stage 3 Worksheet contains one table which is used to calculate the annual nutrient load from new (post-development) landcovers within the redline boundary of the development. The type(s) and area(s) of landcover present on the new development is required to generate nutrient loads associated with the current landcovers on the site.
The second table under the heading 'New landcovers' requires user inputs. You must select the most appropriate landcovers from a dropdown list of 18 landcover types to represent the landcover present on the site following the development. You must also enter the area of each landcover in hectares. The dropdown list contains 10 agricultural landcover types and 8 non-agricultural landcover types to represent the landcovers present on the site before development. The descriptions of each landcover type can be found in the guidance that accompanies this calculator. You must determine which landcover types are present within the redline boundary of the development before completing this tool. If there is a landcover within the development area that is not in the dropdown list please select the most similar landcover type.
Notes on Stage 3S: nutrient load removed through SuDS
The Stage 3S Worksheet contains one table in which you can enter key information about the use of SuDS to treat the runoff from the site and reduce the nutrient loading from new landcovers.
In this section the user will need to enter information about the SuDS features used to calculate the amount of nutrients removed through SuDS treatment of surface runoff. This section must only be completed if SuDS are compliant with the national standards and are being implemented under the requirement of the Flood and Water Management Act 2010 (Schedule 3). Any SuDS that are being implemented in addition to the site plans for the purposes of mitigation must not be considered in the nutrient budget calculation for the site. In this instance, it is instead recommended that a second calculation is populated - the People over Wind judgment means that it is no longer possible to apply mitigation measures at the screening stage.
The landcovers and areas present on the new site will be automatically populated from Stage 3.
You will need to: - enter the catchment area that drains to the SuDS as a proportion of the new landcovers - choose the SuDS features used - enter the nutrient removal rates as a percentage
It is recommended that the surface area of the SuDS features are included within the area of the landcover that they drain. If required, you can split the landcover up in Stage 3 to demonstrate multiple drainage configurations. You can select a SuDS feature from a list of 23 options. If a SuDS management train that comprises multiple SuDS features is being implemented you should select the appropriate option from the start of the list. Otherwise, you should select the individual SuDS feature being used. If the appropriate SuDS feature cannot be found in the list, select the most relevant alternative. The nutrient removal rates should be entered as a whole number percentage between 0-100. You must be able to provide evidence for the removal rates you have entered. This is likely to require the submission of a drainage assessment and a detailed design of the SuDS features.
The amount of nutrients removed through SuDS is automatically calculated using the landcovers and associated loads from Stage 3, the drainage area, and the nutrient removal rates. The total load removed through SuDS is incorporated into the final nutrient budget calculation. Selecting the type of SuDS feature used is to ensure that the nutrient budget calculator matches the SuDS design detailed in the planning application.
Further information on SuDS can be found in the table under the heading 'Sources of information on SuDS and how to design them for nutrient removal' that follows this text.
Sources of information on SuDS and how to design them for nutrient removal

Description of information	Link to source of information
National standards for sustainable drainage systems (SuDS) can be found here:	National standards for sustainable drainage systems (SuDS)
Ciria's Using SuDS to reduce nitrogen in surface water runoff (C815) can be found here:	Using SuDS to reduce nitrogen in surface water runoff (C815)
Ciria's Using SuDS to reduce phosphorus in surface water runoff (C808F) can be found here:	Using SuDS to reduce phosphorus in surface water runoff (C808F)

Notes about the final annual nutrient budget
The Stage 4 Worksheet contains 2 tables which calculate the TP budget and the amount of TN generated.
The final stage automatically calculates the final nutrient budget using the results from Stage 1 to Stage 3S using the following equation: (Stage 1 - Stage 2 + (Stage 3 - Stage 3S)) * 1.2 = Stage 4
The first table under the heading 'Total phosphorus budget' calculates the amount of TP that you need to mitigate.
The second table under the heading 'Total nitrogen generated' calculates the amount of TN generated.

Stage 1 - additional nutrient loading from wastewater

This sheet contains 2 tables. The tables are separated by a heading, which describes the following table.

The first table labelled 'Wastewater load input data' requires user inputs. Cells A8, A9, A13, A17 to A20, A22 to A23 are automatically generated and will state 'Not applicable' unless the required user inputs have been entered. You will need to fill in cells B6, B7, B10 to B12 and B14 to B23, unless the description states 'Not applicable'. Cells B8, B9, B13 are automatically generated and will state 'Not applicable' unless the user inputs have been entered. If the user does not enter a postcode in cell B7, cells A9 and B9 will state 'Not applicable', however this data can be selected in Cell B6 in Stage 2. Cells B24 and B25 are automatically generated and will state '0.00' unless the user inputs have been entered.

The second table labelled 'Final calculation of nutrient load from wastewater' does not require any user inputs. Cells B28 to B31 are automatically generated and will state '0.00' unless the user inputs have been entered in the second table labelled 'Wastewater load calculation table'.

How to fill in the table 'Wastewater load calculation table':
Cell B6: Select the Special Area of Conservation (SAC) from the dropdown list.
Cell B7: Enter the postcode, or the nearest postcode, for the proposed development site. This input is optional.
Cell B10: Select the project type or development type from the dropdown list.
Cell B11: Enter the number of additional units being created.
Cell B12: Enter the Local Planning Authority the development is within, if a valid postcode has not been entered into cell B7.
Cell B14: Select 'Yes' if the default occupancy rate is being used for the development if the project type is residential from the dropdown list. Select 'No' if the default occupancy rate does not apply to the residential development.
Cell B15: Enter the average occupancy rate of the development if the default occupancy rate is not automatically generated in cell B13.
Cell B16: Enter the water usage per resident or customer/user in litres per person per day. This value should be kept at 120 for residents unless other efficiency measures are used.
Cell B17: Enter the percentage of customers/users coming from outside the catchment if the project type is not residential. The default value is set to 100%.
Cell B18: Enter the number of employees per unit if the project type is not residential.
Cell B19: Enter the water usage per resident or customer/user in litres per person per day. The default value is 120.
Cell B20: Enter the percentage of employees coming from outside the catchment if the project type is not residential. The default value is set to 100%.
Cell B21: Select the connecting wastewater treatment works (WwTW) from the dropdown list.
Cell B22: Enter the certified value of total phosphorus (TP) if you select 'Package Treatment Plant user defined' or 'Septic Tank user defined' in cell B21. Otherwise the default values for these sewarage systems will be used in the calculation of the nutrient load associated with wastewater.
Cell B23: Enter the certified value of total nitrogen (TN) if you select 'Package Treatment Plant user defined' or 'Septic Tank user defined' in cell B21. Otherwise the default values for these sewerage systems will be used in the calculation of the nutrient load associated with wastewater.

Wastewater load input data

Description of required information	Data entry column - user inputs required
Special Area of Conservation (SAC):	River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid
Postcode:	LL11 4YH
Local Planning Authority (LPA):	**Wrexham County Borough Council**
Rainfall:	**823**
Project type:	Residential
Development proposal (number of additional units):	455
Not applicable	Not applicable
Default occupancy rate:	**2.33**
Is this default value being used?	Yes
Not applicable	
Water usage per resident (litres/person/day):	120
Not applicable	
Not applicable	
Not applicable	
Not applicable	
Wastewater treatment works:	Five Fords STW
Not applicable	
Not applicable	
Phosphorus permitted limit (mg TP/l):	**1.00**
Nitrogen permitted limit (mg TN/l):	**27.00**

Final calculation of nutrient load from wastewater

Description of values generated	Values generated
Additional population:	**1060.15**
Annual wastewater production (litres):	**46466374.50**
Annual phosphorus load (kg TP/year):	**46.47**
Annual nitrogen load (kg TN/year):	**1254.59**

Stage 2 - nutrient loading from pre-existing landcovers

This sheet contains 2 tables. The tables are separated by a heading, which describes the following table.

The first table labelled 'Physical characteristics' requires user inputs. You will need to fill in cells B5, B7 and B8 unless the description states 'Not applicable'. Cell B6 is automatically generated and will state 'Not applicable' unless a valid postcode has been entered into the previous worksheet.
The second table labelled 'Pre-exisiting landcovers' requires user inputs. You will need to fill in cells A11 to B25. Cells B26 and C11 to D26 are automatically generated and will state '0.00' unless the required user inputs have been entered. Row 26 automatically calculates the 'Total' sum of cells B11 to B25 in cell B26, C11 to C25 in C26, and D11 to D25 in D26.

How to fill in the table 'Physical characteristics':
Cell B5: Select the appropriate soil drainage for the site from the dropdown list.
Cell B7: Select 'Yes' if the automatically populated rainfall value is correct for the site if a valid postcode has been entered into the worksheet titled 'Stage 1'. Select 'No' if the automatically populated rainfall value is incorrect if a valid postcode has been entered into the worksheet titled 'Stage 1'.
Cell B8: Select the annual average rainfall the development will receive from the dropdown list if a valid postcode has not been entered into the worksheet titled 'Stage 1'.

How to fill in the table 'Pre-existing landcovers':
Cells A11 to A25: Select the current (pre-development) land covers present within the redline boundary of the site.
Cells B11 to B25: Enter the area in hectares of each land cover.

Physical characteristics

Description of required information	Data entry column - user inputs required
Soil drainage:	Freely draining
Rainfall identified using postcode (mm/year):	**823**
Is this rainfall value correct?	Yes
Not applicable	

Pre-existing landcovers

Landcover	Area (hectares)	Phosphorus load (kg TP/year)	Nitrogen load (kg TN/year)
Lowland grazing	20.8	**2.70**	**308.88**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
		0.00	**0.00**
Total:	**20.80**	**2.70**	**308.88**

Stage 3 - nutrient loading from new landcovers

This sheet contains one table. A heading describes the table.

The table is labelled 'New landcovers'. You will need to fill in cells A5 to B19. Cells B20, C5 to D19 are automatically generated and will state '0.00' unless the required user inputs have been entered. Cells E5 to E19 are automatically populated and will state 'Not applicable' unless the total area of the landcovers does not match the total area of the landcovers in the worksheet titled 'Stage 2'. Row 20 automatically calculates the 'Total' sum of cells B5 to B19 in cell B20, C5 to C19 in C20, and D5 to D19 in D20.

How to fill in the table 'New landcovers':
Cells A5 to A19: Choose the new (post-development) land covers present within the redline boundary of the site.
Cells B5 to B19: Enter the area in hectares of each land cover.

New landcovers

Landcover	Area (hectares)	Phosphorus load (kg TP/year)	Nitrogen load (kg TN/year)	Notes on data
Residential land	14.97	**24.70**	**229.64**	**Not applicable**
Water	0.19	**0.00**	**0.00**	**Not applicable**
Open land – built environment	0.04	**0.04**	**0.36**	**Not applicable**
Greenspace	5.6	**0.11**	**16.80**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
		0.00	**0.00**	**Not applicable**
Total:	**20.80**	**24.85**	**246.80**	**Not applicable**

Stage 3S - nutrient load removed through SuDS

This sheet contains one table. A heading describes the table.
The table is labelled 'SuDS information'. SuDS stands for sustainable urban drainage systems.

Cells A5 to A19 are automatically populated with landcovers entered into the worksheet titled 'Stage 3' and will state 'Not applicable' if landcovers have not been entered into the corresponding cells in the worksheet titled 'Stage 3'. Cells B5 to B20 are automatically populated with the area in hectares of the landcovers entered into the worksheet titled 'Stage 3' and will state '0.00' if areas have not been entered into the worksheet titled 'Stage 3'. You will need to fill in cells C5 to F19. Cells G5 to H20 are automatically calculated and wi l state '0.00' unless the required inputs have been entered. Row 20 automatically calculates the 'Total' sum of cells B5 to B19 in cell B20, the sum of ce ls G5 to G19 in cell G20 and the sum of cells H5 to H19 in cell H20.

How to fill in the table 'SuDS information':
Cells C5 to C19: Enter the size of the catchment area that drains to the SuDS feature as a proportion (%) of the landcover in the areas (in hectares).
Cells D5 to D19: Select the SuDS feature that is being used to treat the run off from the dropdown list.
Cells E5 to E19: Enter the phosphorus removal rate of the nutrient inputs as a percentage (%).
Cells F5 to F19: Enter the nitrogen removal rate of the nutrient inputs as a percentage (%).

SuDS information

Landcover	Area (hectares)	Proportion of landcover area served by SuDS feature (%)	SuDS feature	P removal rate for SuDS feature	N removal rate for SuDS feature	Phosphorus load removed through SuDS (kg TP/year)	Nitrogen load removed through SuDS (kg TN/year)
Residential land	**14.97**	100	Multi-stage management train (3+)	30	30	**7.41**	**68.89**
Water	**0.19**					**0.00**	**0.00**
Open land – built environment	**0.04**					**0.00**	**0.00**
Greenspace	**5.60**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
#REF!	**#REF!**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
Not applicable	**0.00**					**0.00**	**0.00**
Total:	**#REF!**	**Not applicable**	**Not applicable**	**Not applicable**	**Not applicable**	**7.41**	**68.89**

Stage 4 - final nutrient budget calculation

This sheet contains 2 tables. The tables are separated by a heading, which describes the following table. The tables are automatically calculated using the outputs from the previous stages.

The first table labelled 'Total phosphorus budget' presents the calculations that underpin the final total phosphorus (TP) budget in cell B10. The second table labelled 'Total nitrogen generated' presents the calculations that underpin the final total nitrogen (TN) budget in cell B18.

You do not need to fill in any cells in the tables. Cells B5 to B10 and B13 to B18 are automatically calculated. Cells B5 to B9 and cells B13 to B17 will state '0.00' unless user inputs have been entered to all of the required stages. Cell B10 will state 'No TP mitigation needed' if the phosphorus budget is less than 0.00 kilograms TP per year. Cell B18 will state 'No additional TN generated' if the nitrogen budget is less than 0.00 kilograms TN per year.

Total phosphorus budget

Description of phosphorus values generated	Values generated
Stage 1 phosphorus load (kg TP/year):	**46.47**
Stage 2 phosphorus reduction (kg TP/year):	**2.70**
Stage 3 phosphorus load (kg TP/year):	**24.85**
Stage 3S phosphorus load removed through SuDS (kg TP/year):	**7.41**
Phosphorus budget ((Stage 1 - Stage 2) + (Stage 3 - Stage 3S)):	**61.21**
Phosphorus budget + 20% buffer	**73.45 kg TP/year requires mitigation**

Total nitrogen generated

Description of nitrogen values generated	Values generated
Stage 1 nitrogen load (kg TN/year):	**1254.59**
Stage 2 nitrogen reduction (kg TN/year):	**308.88**
Stage 3 nitrogen load (kg TN/year):	**246.80**
Stage 3S nitrogen load removed through SuDS (TN kg/year):	**68.89**
Nitrogen budget ((Stage 1 - Stage 2) + (Stage 3 - Stage 3S)):	**1123.62**
Nitrogen budget + 20% buffer:	**1348.34 kg TN/year will be generated**

Calculator version 4.0 - February 2026

Appendix C – WCBC Planning Committee Report Phosphorous Update

wrexham
COUNTY BOROUGH COUNCIL
CYNGOR BWRDEISTREF SIROL
wrecsam

REPORT TO:	Planning Committee
REPORT NO.	COEP/45/26
DATE:	6 July 2026
REPORTING OFFICER:	Chief Officer Economy and Planning
CONTACT OFFICER:	Chris Smith – Interim Head of Planning Policy
SUBJECT:	Information Report – Phosphorus Update
WARD:	N/A

1.0 PURPOSE OF THE REPORT

2.0 INFORMATION

Lower Dee Phosphorus Compliance and Implications for Development

Current Compliance Position

2.1 According to compliance data published by Natural Resources Wales (NRW) for the period 2020–2024, the Lower Dee waterbody is not meeting its phosphorus (P) conservation target. The recorded concentration was 56.5 exceeding the target threshold of 50 µg/l (micro-grams per litre).

2.2 Elevated nutrient levels, particularly phosphorus and nitrogen, can lead to excessive algal growth in freshwater environments. This process, known as eutrophication, can degrade water quality and harm biodiversity within protected habitats.

2.3 New development, including housing, new employment and agricultural schemes, can increase nutrient inputs through wastewater discharges, surface water runoff and diffuse pollution. Where a protected site is already failing its

conservation targets, any additional nutrient loading may adversely affect the integrity of the site.

2.4 The Lower Dee forms the downstream section of the River Dee and Bala Lake Special Area of Conservation (SAC). In the absence of evidence demonstrating that a development proposal would not adversely affect the SAC, the Local Planning Authority have been refusing planning permission or delaying determination of applications.

Review of Compliance Data

2.5 In March 2025, NRW published data indicating that the Lower Dee exceeded the phosphorus target of 50 µg/l and was therefore classified as failing.

2.6 However, NRW assigned a **low confidence** rating to this assessment. The classification was heavily influenced by a single outlier sample result of approximately 335 µg/l, which is approximately three times as high as the next available outlier and ten times as high as the average results from other recordings.

2.7 Although NRW considers the result technically valid and has no basis for excluding it, its exceptional nature significantly influenced the overall average and contributed to the failing classification. This unusual result is the primary reason NRW expressed low confidence in the assessment.

2.8 Correspondence with the Welsh Government indicates that diffuse rural pollution i.e. from non-specific sources such as field run-off, are the most likely explanation for the phosphorus spike. The sample was taken during increasing river flows associated with snowmelt following a period of dry weather, conditions that can wash nutrients from land. Continuous and intermittent sewage discharges will also have contributed to overall phosphorus levels and the 2024 compliance outcome. Although Welsh government were not explicit, it is implicit the sample was not likely to be caused by discharges from a wastewater treatment works.

2.9 While the outlier result cannot be ignored, understanding its context is important for assessing the true condition of the waterbody and the impact of development. To provide additional evidence, Wrexham Council commissioned an independent review of the available phosphorus monitoring data.

Evidence Review

2.10 NRW's compliance assessment only considered a limited dataset of samples, those taken by NRW. However, because the River Dee crosses the England–Wales border, the review considered monitoring data and assessment methodologies used by both NRW and the Environment Agency (EA).

2.11 NRW took 13 samples over 3 years (2021-2023), a reduction from the 60 samples taken for the period 2017-2019. The consultants we engaged discovered the EA utilise the same monitoring location (Farndon Bridge) and used the same methodologies for phosphorus recording and data analysis as NRW and had a data set of 36 across the same time period[1] as NRW, with a total of 97 data sets recorded between 2018 and 2026.

2.12 The EA data shows similar average results to that from NRW, it is only the NRW outlier of 335 µg l, that does not have a similar reference in the EA data. Analysing the EA data in a similar way demonstrates that this part of the River Dee and Bala Lake SAC passes the limit, as it remains below 50 µg l -1.

2.13 When the EA data is assessed using a similar methodology, the Lower Dee remains below the 50 µg/l threshold and therefore passes the phosphorus target.

Conclusions

2.14 The review concludes that, when all available phosphorus data from both NRW and the EA are considered together and assessed using NRW's analytical approach, the Lower Dee remains below the phosphorus target. This conclusion remains unchanged even when the 335 µg/l outlier and other atypical results are included in the analysis.

2.15 On this basis, the evidence suggests that the Lower Dee should not be considered to be at risk of pollution failing its phosphorus target.

Counsel Advice

2.16 Counsel advice was sought not on the data itself, that is an evaluative matter for the decision maker, but on how to use the data to inform decision making.

2.17 The legal advice concludes that the Council can lawfully rely on the combined Environment Agency (EA) phosphorus data and NRW data rather than NRW's data alone when determining planning applications in the Lower Dee catchment, provided it does so transparently, rationally and with clear reasons.

2.18 Counsel noted the council may make its own judgment under the Habitats Regulations and is not legally bound to accept NRW's interpretation of the data. The Council can lawfully proceed on the basis that the Lower Dee is not failing phosphorus targets, despite NRW's official 2024 classification, because the combined EA/NRW evidence provides a stronger and more proportionate evidential basis for decision-making. However, the Council must formally justify

[1] i.e. targeting one sample a month, every month

that position, give proper weight to NRW's evidence, and keep the matter under review as new monitoring data becomes available.

2.19 Counsel advice is reflected in the approach outlined in paras 2.20-27 below.

Implications for Development

2.20 With this study and legal advice, it **can** be concluded that a proposal within the lower Dee catchment **does not adversely affect the integrity** of the River Dee and Bala Lake SAC, even with a net increase in phosphorus.

2.21 To arrive at this conclusion, the reasoning must be articulated on a case-by-case basis (through an Appropriate Assessment) with a clear explanation as to why a development proposal does not adversely affect the integrity of the SAC. The reasoning would refer to the evidence review report and its findings, establish the case specific facts, relevant policy (local/National planning policy and NRW policy) and any other material considerations.

2.22 However, this is a dynamic situation. Should new evidence come to light e.g. new compliance data and/or evidence that a project alone or in combination with other projects could have such a significant impact there would be an adverse effect, this would be material to our decision making and the outcome of our decision i.e. refusal of planning permission could still be an option.

2.23 NRW would be consulted on the Appropriate Assessment, and its views would be taken into account before a decision is made.

2.24 The reasoning supporting any planning decision must be transparent, evidence-based and capable of withstanding scrutiny.

2.25 For the avoidance of doubt, currently all planning applications for net new housing and employment are currently held in abeyance. However the above approach will support decision making going forward allowing us to process applications.

2.26 In the short term, the Development Management team faces a backlog of planning applications that have been held up by phosphorus. There will be expectations that we can determine applications quickly but limited staffing resources mean we will need to prioritise applications. In due course. a further information report will be presented setting out how we will do this.

2.27 It is also important to note, this approach only applies to development and waste-water treatment works discharging into the lower Dee catchment (see Appendix 1 for a full list of settlements), for all other catchments upstream of the lower Dee, there is no change in approach, nutrient neutrality is required by NRW i.e. development in Cefn Mawr or the Ceiriog.

NRW Position

2.28 NRW will be consulted on the rationale underpinning each decision within the lower Dee and their response taken into account.

2.29 With regards to the compliance data, NRW confirm the outlier result is a genuine event but acknowledges low confidence in the data and how the data is interpreted hence they did not require nutrient neutrality as their policy for development in the lower Dee, leaving this to the discretion of the Local Planning Authority.

2.30 NRW have been consulted on a draft version of the evidence report and did not challenge the substantive arguments and conclusion that the waterbody can be considered to be passing in light of EA data. Though they did say there is no scope to change or alter the 2024 assessment, they conceded that EA data can be considered for the future review in 2027.

3.0 RECOMMENDATION

3.1 To note the contents of the Information Report

4.0 BACKGROUND PAPERS

4.1 None

Appendix 1

Waste-water Treatment within the Lower Dee catchment

Lower Dee Waterbody	
Waste-water Treatment Works	**Settlement Served**
Five Fords	Bersham, Brymbo, Bwlchgwyn, Caego, Chirk, Coedpoeth, Cross Lanes, Gwynfryn, Marchwiel, New Broughton, New Brighton, Pentre Bychan, Penycae, Plas Madoc, Rhostyllen, Rhosllanerchrugog, Ruabon, Southsea, Tanyfron, Wrexham, Wrexham Industrial Estate,
Gresford	Bradley, Gresford, Gwersyllt, Llay, Rhosrobin, Sydallt
Lavister	Burton, Marford, Rossett, Trevalyn
Holt	Holt
Bangor	Bangor
Overton	Overton
Penley	Penley
Bronington	Bronington