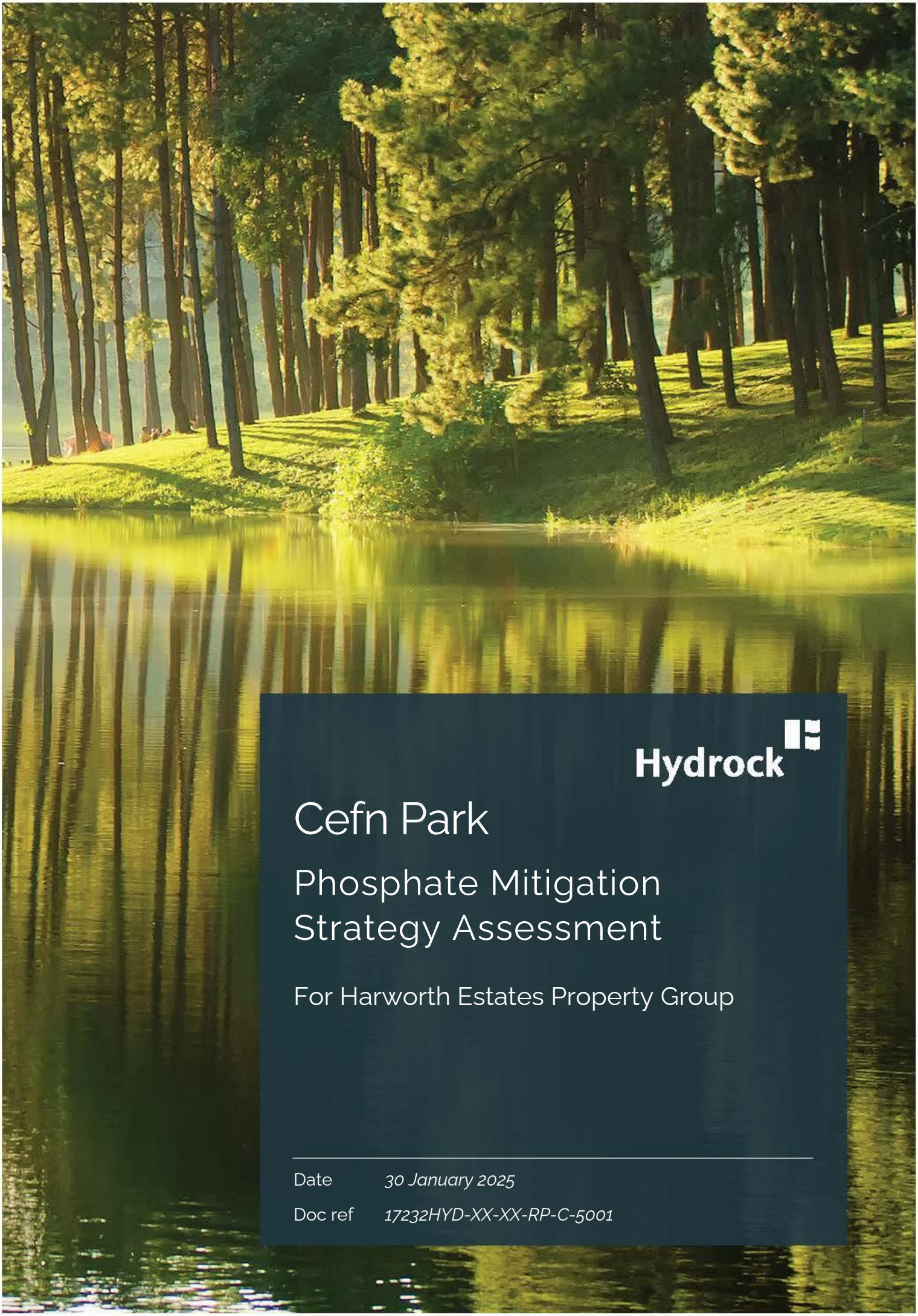


Hydrock

Cefn Park

Phosphate Mitigation Strategy Assessment

For Harworth Estates Property Group

Date	*30 January 2025*
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Hydrock Consultants Limited has prepared this report in accordance with the instructions of the above named client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

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1. Introduction

This report has been prepared to provide our client (Harworth Estates Property Group) with an understanding of the likely increase in phosphates as a result of the proposed development along with potential mitigation options and systems in place within the Local Plan for achieving nutrient neutrality.

2. Site Details

2.1 Site Location

The site is located to the eastern edge of Wrexham, and is a roughly irregular shaped parcel of land which currently consists of arable land used for crops, woodland areas, playing fields and a pond.

Vehicular access is via the western site boundary off Cefn Road.

Table 1: Site Details

Site Referencing Information	
Site Address	Thornleigh, Caia Park, Wrexham, Wales, LL13 9GA
Grid Reference	335396, 351025 SJ353510

The sites' location places it within the anticipated catchment of the Five Fords WwTW, located just outside Wrexham in north east Wales. Whilst Nutrient Budget Calculators are available, at the time of writing this report, no budget calculator containing information for the Five Fords Treatment Works could be located.

2.2 Proposed Site Use

It is proposed to develop the site for 900 dwellings and will include internal access roads, driveways/parking, SuDS and areas of public open space.

Table 5.2 of the Wrexham local plan indicates a projected average household size of 2.244 persons per dwelling.

Given the proposed site use, the majority of the nutrient export will come from foul effluence. The table below provides a breakdown of wastewater generation by the proposed development.

Table 2: Effluent Generation

Variable / Calculation	Value	Units
No. of Units	900	Dwellings
Average Occupancy	2.244	Persons/ Dwellings
Total Population increase	**2020**	**Persons**
Water Use per person	120	l/day
Wastewater Volume Generated	**242,352**	**l/day**
	88,458.480	**m^3/year**

3. Total Phosphorus Budget

3.1 Stage 1: Total Phosphorus increase due to Population

The table below demonstrates the increase of Total Phosphorus discharge to the environment by the Five Fords STW (Sewerage Treatment Works) as a result of increased population generated by the proposed development, under the proposals that foul effluent shall be discharged to the Welsh Water network.

NRW permit CM0077801 stipulates an allowable discharge of TP from the Five Fords STW as 1mg/l from 2025 and 0.7mg/l post 2030. As such, both permit conditions have been assessed.

Table 3: Phosphate from Foul Effluent

Variable / Calculation	Value	Units
Discharging WwTW	Five Fords	
WwTW Permit Limit (2025)	1.00	mg/l
WwTW Permit Limit (2030)	0.70	mg/l
TP discharged by WwTW (2025)	**88.46**	**kg/yr**
TP discharged by WwTW (2030)	**61.92**	**kg/yr**

3.2 Stage 2: Existing (Pre-development) Total Phosphorus Generation

The table below demonstrates the current Total Phosphorus discharged to the environment by surface water flows generated from rainfall event, given the current site use.

Table 4: Existing Phosphorus Export

Variable / Calculation	Value	Units
Location characteristics		
Soil drainage type	Freely	
Annual Rainfall	900.1-950	mm/yr
Total area of development site	40.27	ha
General Cropping	38.81	ha
Woodland	1.46	ha
Annual Phosphorus Export		
General Cropping	4.66	kg/yr
Woodland	0.03	kg/yr
TP load from current land usage	4.69	kg/yr

3.3 Stage 3: Total Phosphorus generated by Proposed Land Use

The table below demonstrates the Total Phosphorus discharge to the environment by surface water flows generated from rainfall event, given the current site use.

Table 5: Proposed Land use Phosphorus Export

Variable / Calculation	Value	Unit
Total area of development site		
Urban development	6.08	ha
Wetland / SuDS area	1.73	ha
Open Space / Greenfield	32.46	ha
Annual Phosphorus Export		
Urban development	5.05	kg/yr
Wetland / SuDS area	0.00	kg/yr
Open Space / Greenfield	4.59	kg/yr
TP load from proposed land usage	**9.59**	**kg/yr**

3.4 Stage 4: Net Change in Total Phosphorus (Nutrient Budget)

The table below summarises the net increase in Total Phosphorus as a result of the proposed development, assuming discharge to the Welsh Water network, and the quantities requiring mitigation.

Table 6:Total Phosphorus Budget

Variable / Calculation	Value	Units
Total Phosphorous loading from additional population (2025)	88.46	kg/yr
Total Phosphorous loading from additional population (2030)	61.92	kg/yr
Total Phosphorous currently generated from the site	-4.69	kg/yr
Total Phosphorous loading from proposed Land Use	9.59	kg/yr
Total Phosphorous (2025)	**93.36**	**kg/yr**
Total Phosphorous (2030)	**66.82**	**kg/yr**
Phosphorous Buffer	20	%
Total Phosphorous Budget from development site (2025)	**112.03**	**kg/yr**
Total Phosphorous Budget from development site (2030)	**80.18**	**kg/yr**

4. Mitigation

4.1 Wrexham Council DCPRS

As allocated within the Wrexham Local Plan, the proposed development is subject to the Dee Catchment Phosphorus Reduction Strategy (DCPRS) as stipulated by Wrexham Council. Further it is stipulated that where possible foul effluent is to be discharged to public sewer opposed to onsite treatment and disposal.

In accordance with paragraph 5.102 of the Wrexham Local Plan, the proposed development falls within Category 1 of the DCPRS and as such mitigation requirements are to be delivered by the Council to meet the requirements of the Habitats Regulations.

The scheme is therefore to be delivered in accordance with the DCPRS ensuring no detrimental impact.

4.2 SuDS Modification

Further, where practicable SuDS are to be implemented in accordance with CIRIA guidance C808F "Using SuDS to reduce phosphors in surface water runoff".