

Nutrient Neutrality Study One Horton Heath: Quobleigh Breach

Eastleigh Borough Council (One Horton Heath Team)

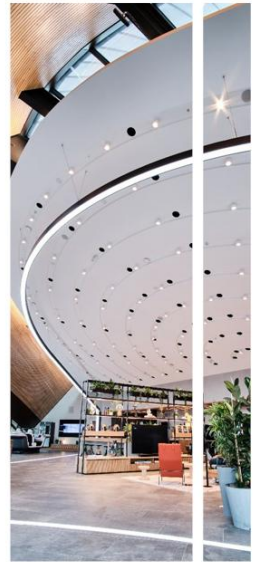
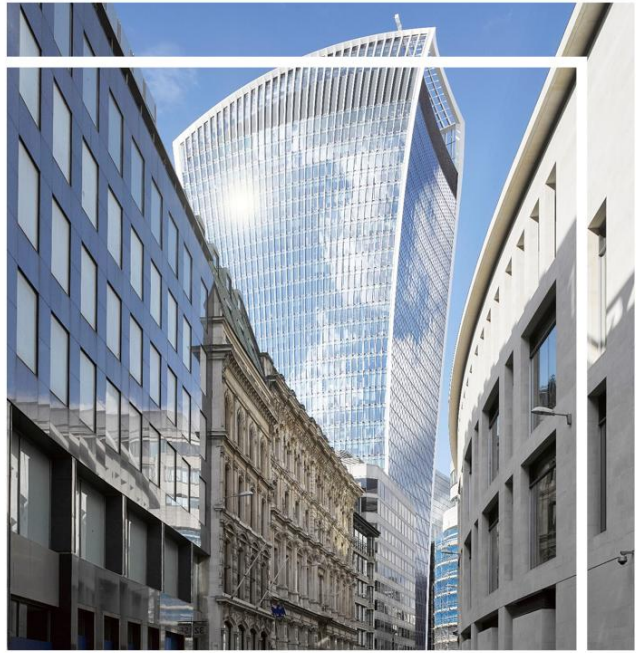
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Executive Summary

Hilson Moran has been appointed by the One Horton Heath (OHH) Team (the Applicant) at Eastleigh Borough Council (EBC) to provide a Nutrient Neutrality Study of Quobleigh Breach, part of the OHH masterplan.

OHH is a major mixed-use development, located near Eastleigh in Hampshire, which was granted Outline Planning Permission in October 2025 for up to 2,500 homes, a local centre, a primary school and commercial floorspace. Quobleigh Breach (National Grid Reference SU 48427 17420) comprises a full Reserved Matters Application (RMA) for the erection of 269 residential units with hard and soft landscape works, internal roads, footway/cycleways, associated parking spaces and associated infrastructure.

The aim of the Nutrient Neutrality Study is to provide a robust assessment of the impact of the development on nitrogen (N) and phosphorous (P) losses into the River Itchen catchment and demonstrate how, through the application of appropriate mitigation measures, the Quobleigh Breach scheme can deliver nutrient neutrality. The findings of the study will support EBC, as the competent authority under the Habitat Regulations, in the completion of an appropriate assessment of whether the scheme would adversely affect the integrity of the European Designated Sites associated with the River Itchen and the Solent.

The report provides a summary of the evidence gathered to support the Nutrient Neutrality Study together with the neutrality calculations for the scheme and effect of appropriate mitigation measures proposed for inclusion within the scheme.

Incorporating a 20 % buffer for nutrient losses as per NE guidance, the Quobleigh Breach development is identified to give rise to:

- **190.86 kg N/yr** deficit pre-2030;
- **156.40 kg N/yr** deficit post-2030.
- **5.72 kg TP/yr** deficit pre-2030;
- **7.04 kg TP/yr** deficit post-2030.

The following mitigation measures are proposed to deliver nutrient neutrality in the Quobleigh Breach scheme:

- N & P benefits brought forward from the Upper Acre phase of the development (*i.e.* pre-2030 benefits of **183.36 kg N/yr** and **4.31 kg P/yr** from temporary land use changes during construction and post-2030 benefits of **578.37 kg N/yr** and **10.59 kg P/yr**); and
- Temporary offsetting nutrient losses from land changes associated with land within Quobleigh Breach red line boundary during the pre-2030 phase.

Following inclusion of the above N & P benefits brought forward from the Upper Acre phase of the development, it is demonstrated that better than nutrient neutrality for N & P in the post-2030 scenario can be achieved, with benefits of **448.04 kg N/yr** and **4.72 kg P/yr**.

With regard to the pre-2030 deficits of **190.86 kg N/yr** and **5.72 kg P/yr**, N and P-neutrality can be maintained pre-2030, through temporary land change measures, comprising:

- Temporary pre-2030 conversion of 6 ha of parcel 33 from agriculturally managed land to greenspace during construction of Upper Acre dwellings on the remainder of the plot (*i.e.* parcels 32, 34, 0.7 and the rest of parcel 33).
- Temporary pre-2030 conversion of 3.58 ha of parcel 26 from agriculturally managed land to greenspace during construction of Quobleigh Breach dwellings on the remainder of the plot (*i.e.* parcels 0.1, 0.2, 2, 3, 4, 8, 25, and 27).

When this temporary mitigation is taken into account it ensures better than nutrient neutrality for N & P loadings, with benefits of **79.12 kg N/yr** and **2.38 kg P/yr**, prior to 2030.

As better than N & P neutrality can be demonstrated for both the pre- and post-2030 scenarios for the Quobleigh Breach scheme, no further mitigation measures need to be identified for this phase of the OHH development.

The above post-2030 N & P benefits of **448.04 kg N/yr** and **4.72 kg P/yr** will be carried forward to other parcels of the OHH masterplan (such as The Holme & Homestall Reserved Matters scheme) and offset against other development parcels on the site as part of the overall mitigation package.

It should be noted that the remaining pre-2030 benefits of benefits of **79.12 kg N/yr** and **2.38 kg P/yr** would still be enough to offset a further 33 completed and occupied dwellings, either within the Upper Acre or Quobleigh Breach schemes. As such, there is plenty of headroom in the calculations to permit higher rates of pre-2030 completion and occupation than the predicted 33%, if required. In the unlikely event that this figure of 264 dwellings (*i.e.* 141 from Upper Acre, 90 from Quobleigh Breach and 33 additional dwellings from either) completed and occupied by 2030 is desired or exceeded, then it is anticipated that additional agricultural-to-greenspace conversion across the OHH development would readily facilitate any further short-term offset requirements. All other phases of the OHH scheme are scheduled for first completions and occupations to happen post-2030.

1. Introduction

1.1. Background

Proposed development within the Hampshire area, particularly those associated with residential land use and tourism, can have impacts associated with nitrate concentrations reaching the Solent and influencing the qualifying features of internationally designated sites associated with the Solent. These designated sites are the Solent Maritime Special Area of Conservation (SAC), Portsmouth Harbour Special Protection Area (SPA), Chichester and Langstone Harbours SPA and Solent and Southampton Water SPA. Additional nitrogen (N) loadings from new development, principally associated with increased wastewater generation, have been identified to be causing algal blooms within the Solent that influence dissolved oxygen levels within the marine waterbody as well as smothering food resources for birds and marine life.

Following a test case heard in the European court, Natural England (NE) advised that no planning consents should be granted within the region unless they can demonstrate nitrogen neutrality. More recently, there has also been an interest in reducing phosphorous (P) loadings to downstream European protected areas and NE now also expects P neutrality to be demonstrated for all residential schemes coming forward within the River Itchen catchment, as per the OHH scheme.

Hilson Moran has been appointed by the OHH Team at EBC to provide a Nutrient Neutrality Study of Quobleigh Breach, part of the OHH masterplan, centred on National Grid Reference SU 48815 17105 and identified in Figure 1.1.

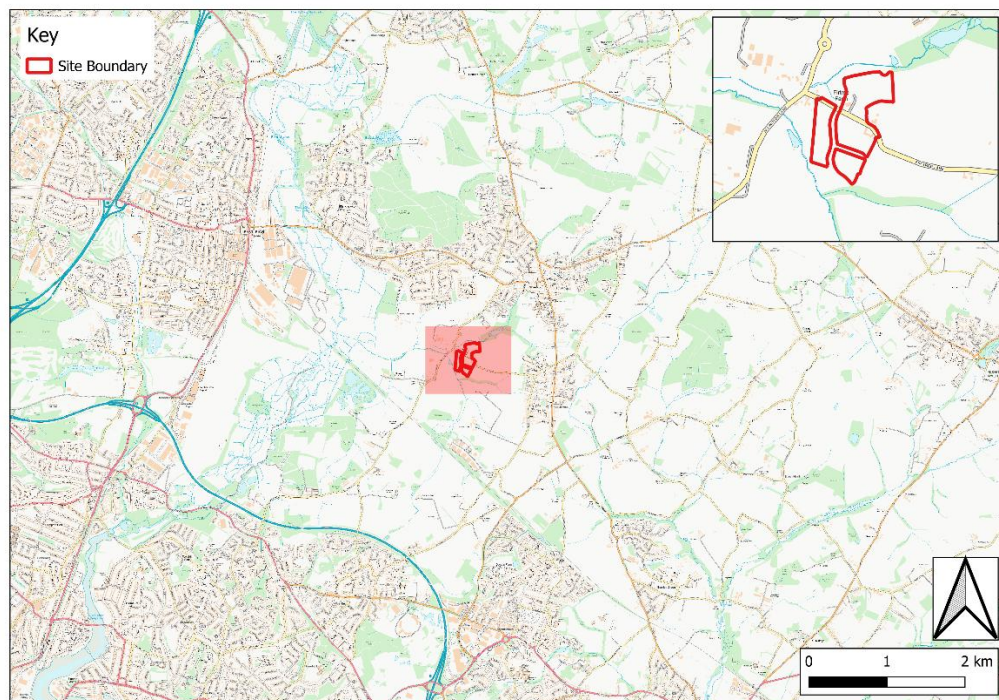


Figure 1.1 Site Location (Contains Ordnance Survey data © Crown copyright and database right 2025)

Quobleigh Breach is located near Eastleigh in Hampshire (National Grid Reference SU 48427 17420) and comprises a full planning application for the erection of 269 residential units with hard and soft landscape works, internal roads, footway/cycleways, associated parking spaces and associated infrastructure.

The layout of the Quobleigh Breach scheme is presented in Figure 1.2.



Figure 1.2 Proposed Layout of Quobleigh Breach

1.2. Purpose of the Report

This Nutrient Neutrality Study has been produced to accompany the full application for the Quobleigh Breach scheme and to provide sufficient evidence to both EBC and NE that N and P neutrality can be achieved as part of the development proposals, in order to avoid any detrimental impacts on downstream European Designated Sites. The study is intended to support EBC's appropriate assessment under the Habitats Regulations.

1.3. Structure

Following this introductory section, an overview to the approach and methodology is provided in Section 2. Section 3 identifies the results of the nutrient balance, considering the nutrient export from the proposed development and the baseline nutrient export to identify the net change as a result of the scheme. Section 4 outlines the mitigation proposals proposed to deliver nutrient neutrality and Section 5 provides a summary of the study and conclusions.

Appendices and references can be found at the end of the document, with document control information included at the front.

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1.5. Declaration of Competency

This assessment has been carried out by Dr Paul Bond PhD MSc BSc CEnv CSci MEnvSc MCIEEM. Paul possesses over 30 years' experience of environmental, civil engineering and industrial projects within commercial, public and academic sectors. He holds a doctorate in SuDS, possesses post-doctoral experience in bacterial nitrogen transformations and is also a competent Ecologist, possessing over 20 years environmental consultancy experience. As such, Dr Paul Bond is suitably qualified and experienced to conduct and direct the Nutrient Neutrality study for the development proposals.

2. Approach

There is currently uncertainty surrounding whether the condition of designated ecological areas located within the Solent Region will be detrimentally impacted by increases in discharges of treated sewage effluent from future housing growth in the area. This issue has been subject to ongoing detailed work commissioned by local planning authorities in association with NE, the Environment Agency (EA) and water companies. Consequently, there is the potential for future housing developments across the Solent Region to exacerbate these impacts, which creates a risk to the potential future conservation status of designated sites. Consequently, NE has stated that one way to address this uncertainty is for new development to achieve nutrient neutrality by securing the required mitigation in compliance with the Habitats Regulations.

NE has developed a recommended methodology to determine the potential impact of new developments on local designated sites. Hilson Moran has been appointed by Stantec, on behalf of EBC to provide a detailed Nutrient Neutrality Study for the development of its OHH scheme in Hampshire. The aim of the study is to accurately reflect current land-use practices and nutrient inputs from the existing site, providing a robust assessment of the impact of the development on downstream European Designated Sites and to inform the selection of appropriate mitigation measures for the scheme.

2.1. European Designated Sites

The Habitats Directive and Conservation of Habitats and Species Regulations 2017 (as amended) make reference to the consideration of likely significant effects of a project or plan on one or more European Sites, including SPAs and SACs.

However, national planning policy, as set out in the National Planning Policy Framework (NPPF)¹, also expects those sites under consideration for designation, *i.e.* potential SPAs (pSPAs) and candidate SACs (cSACs), Ramsar sites and areas identified to provide compensatory sites, to be considered through the Habitats Regulations Assessment (HRA) process. The legislation/agreement governing the designation of the sites are described further below:

- SPAs – classified under the European Council Directive 79/49/EEC ‘on the conservation of wild birds’ (also known as the ‘Birds Directive’) for the protection of wild birds and their habitats, including particularly rare and vulnerable species listed in Annex I of the Directive and migratory species;
- SACs – designated under European Council Directive 92/43/EEC ‘on the conservation of natural habitats and of wild fauna and flora’ (also known as the ‘Habitats Directive’), targeting particular habitats (listed on Annex I) and/or species (listed on Annex II) that are identified as being of European importance;
- Ramsar – listed under the Convention on Wetlands of International Importance (Ramsar Convention, 1971) as sites that support important wetland habitats and species, especially waterfowl habitat; and,
- Compensatory Sites – sites that have been identified to provide compensatory habitat for that impacted by plans or projects permitted through the ‘imperative reasons for overriding public interest’ (IROPI) assessment.

For ease of reference, these designations are collectively referred to within this Nutrient Neutrality Study report as 'European Designated Sites', despite Ramsar designations being made at the international level. SPAs and SACs are also referred to in guidance documents as 'Natura 2000' sites.

2.2. Methodology

Nutrient neutrality advice provided by NE in March 2022 to Local Planning Authorities (LPAs) affected by nutrient neutrality considerations included a new methodology for assessing nutrient neutrality, providing a unified approach for nitrate and phosphate and comprising a nutrient neutrality calculator² with an accompanying guidance document³.

The generic approach is based on four main Stages, with a series of steps in each stage, which are summarised as:

- Stage 1 – Identify the increase in nutrient loading to a Habitats site that results from the increase in wastewater from a new development:
 1. Step 1 – Calculate increase in population due to the development;
 2. Step 2 – Calculate the increase in wastewater production due to the development;
 3. Step 3 – Determine the concentration of nutrients in wastewater and calculate additional wastewater nutrient load;
- Stage 2 – Identify the nutrient loading from the past/present land use of the development site:
 - Step 1 – Obtain nutrient export values from current land use(s);
 - Step 2 – Calculate the annual nutrient export from current land use(s)
- Stage 3 – Identify the nutrient loading from the future mix of land use on the development site:
 - Step 1 – Calculate the annual export from future land use(s);
- Stage 4 – Calculate the net change in nutrient loading to a Habitats site within the addition of a buffer. The net change in nutrient loading and the buffer is the nutrient budget:
 - Step 1 – Calculate the nutrient budget;
 - Step 2 – Add the buffer to the nutrient budget.

Although NE have put this methodology forward for use in demonstrating nutrient neutrality, they identify in their Nutrient Neutrality Summary Guide that the approach is not mandatory and, if they prefer, competent authorities can determine their own solutions as appropriate.

2.2.1. Stage 1: Additional Wastewater Loading

The methodology identifies that Step 1 should consider the additional population that will result from the development, from which the additional nutrients in wastewater can be calculated. However, as the masterplan is delivered in phases and existing residential properties on the site are vacated ahead of respective phases being brought forward, a bespoke approach has been

adopted to allow accurate reflection of how the nutrient loading changes on the wider site under the applicant's control.

The nutrient loading arising from the development has been allocated as the total development population, based on an average occupancy of 2.4 people per dwelling in line with the latest NE methodology. This gives a total nutrient loading for the residential aspect of the developed site. The nutrient loading associated with past/present land use on the development site are accounted for in the baseline nutrient loading (Stage 2), allowing for benefits associated with vacation of residential properties in the wider area under the applicant's control being considered as they occur, providing an offset to the individual plots brought forward at that time.

In addition, Eastleigh and the surrounding areas are classified as 'water-stressed', with potable water largely supplied from local aquifers and by river water abstraction from internationally designated wildlife habitats. In the revised 2015 standards for new housing the Government maintained the water efficiency standard for new buildings at 125 l/person/day. However, it also allowed an 'optional requirement' of 110 l/person/day in 'water stressed areas'. NE states that whichever water efficiency standard is used in its calculator, water usage is increased by an additional 10 litres per person per day to account for changes to less water efficient fittings throughout the lifetime of the development. Consequently, within the updated Nutrient Neutrality Budget Calculator for the River Itchen SAC², the per capita daily water usage is preset at 120 litres per person per day. This comprises the optional requirements of 110 l/person/day, + 10 l/person/day buffer. This allows councils to decide whether certain regulations apply to developments being built in their areas and can include water efficiency in areas facing water shortages. In order to help ease the local water supply situation EBC, Southern Water and the EA have been working together to find ways to reduce pressure on existing water resources.

One such solution is the use of a 'variable infrastructure charge' to encourage water efficiency in new developments. Consequently, EBC has signed up to a water usage pilot scheme with Southern Water to help meet the local sustainable supply balance. The partnership has recommended a voluntary target of 95 litres per person per day be set for each new housing development. Under the Water Industry Act 1991 a one-off charge is payable where properties are connected for the first time into the water supply or the public sewage system. For the term of the pilot scheme if developers meet the 95 litres per person per day target for new homes, then Southern Water will give an infrastructure charge discount of 40% on the standard network connection charges, thereby giving a clear price signal for the developers to drive demand reduction. This 95 litres per person per day benchmark has, therefore, been adopted by EBC for the OHH scheme. This has consequently been used in the Nutrient Neutrality calculation with a 10 litres per person per day buffer, as described above.

The remainder of the approach follows the NE calculator approach. Potential sources of N associated with the proposed development will comprise sewage discharges (first passing through the most appropriate Wastewater Treatment Works (WwTW)) and nutrients associated with urban runoff.

It is intended that all foul sewage from the scheme will be conveyed to Chickenhall Eastleigh WwTW, which is located on the western bank of the River Itchen, approximately 1.8 km west of the site. Chickenhall Eastleigh WwTW currently discharges to the River Itchen. It currently does

not have a consented permit level for N, with mean effluent concentrations estimated to be 27 mg Total Nitrogen (TN)/litre (l), reducing to 25 mg TN/l with allowance for the amount of nitrogen already within potable drinking water, for the calculation of wastewater load. It also has a permitted limit of 0.6 mg Total Phosphorus (TP)/l.

Aligning with the NE Guidance methodology, “*operation of WwTW at 90 % of the consent limit is the closest the water company can reasonably operate the works without risk of breaching the consent limit*”, 90 % of the discharge limit (5.4 mg TP/l) should be used to determine the P load from the new development’s wastewater. As the 27 mg TN/l concentration in the effluent does not represent a permitted level, the 10 % reduction is not applied to this value.

Chickenhall Eastleigh WwTW will benefit from the proposed upgrades scheduled to take place through the Levelling Up and Regeneration Bill (LURB) in 2030. Consequently, a permitted TN limit of 10 mg/l will be adopted for the WwTW post-1st January 2030. This will reduce to 8 mg TN/l with allowance for the amount of nitrogen already within potable drinking water, and to 7.2 mg TN/l with the 10 % operational reduction.

As a result of the LURB upgrade, the permitted limit of TP will also fall from 6 to 0.25 mg/l, post 1st January 2030. This will reduce to 0.225 mg TP/l with the 10 % operational reduction.

It is intended that construction of Quobleigh Breach will start pre-2030. Consequently, as a precautionary approach it is assumed that some of the 269 dwellings will be occupied pre-2030. For the purpose of the wastewater calculations, it has been assumed that ⅓ of the dwellings (*i.e.* 90) will become occupied prior to 1st January 2030 and 180 dwellings thereafter.

The final nutrient loadings are converted from mg/l into mg/day using the identified wastewater volume (assuming 100% return to sewer and thus using volume of potable water used as a proxy for volume of wastewater treated, in line with NE guidance). This is then converted into kg/day and multiplied by 365.25 days, in line with the NE methodology, to obtain the annual nitrogen loading from the development.

2.2.2. Stage 2: Baseline Nutrient Losses

Whilst the NE calculator² provides a methodology for the establishment of the baseline position, the Guidance Document³ identifies that “*if there is good evidence, such as the output from farm-specific Farmscoper modelling or a detailed monitoring exercise, this can be used to support a different export efficient*”. Therefore, the approach taken for N and P is confirmed in the following sections, including reasoned justification for this where it differs from the latest NE methodology.

The approach taken between the two nutrients considered differs and therefore are discussed in turn below. The establishment of the baseline has been made site-wide, as per the methodology discussed below. However, those aspects specific to the Quobleigh Breach scheme have been identified from the wider site in the applicant’s control to identify a development specific baseline. Therefore, the overall site discussion has been retained for completeness.

2.2.3. Nitrogen Methodology

Prior to the issue of the revised NE methodology, significant work had been undertaken for the scheme using the ADAS Farmscoper modelling approach to establish site specific N loadings based on the land-uses present on site and associated farming practices, including peer review of the approach by Dr Richard Gooday of ADAS (one of the creators of the Farmscoper tool). The establishment of baseline N export values has, therefore, been based on farm-specific Farmscoper modelling, using the wealth of site specific evidence collated to support the assessment and peer review of modelling, as the NE methodology acknowledges such an approach to be acceptable, where good evidence exists.

The establishment of N inputs has been made using the following approach:

- Splitting the site into suitably sized units or appropriate land-use categories and subsequent management of N-budget data through a computer-based Geographic Information System (GIS);
- Gathering available information on the historical farming practices actually employed on the site, supported by observations made during a walkover survey of the site and conversations with those currently farming the site;
- Use of the ADAS Farmscoper modelling approach to estimate agricultural nitrogen-inputs to the site, to include contributions from fertiliser, manure applications and livestock;
- Assessing the current resident population of the site, as a product of dwellings x mean household size;
- Gathering information on the foul sewer network serving the site and calculating current inputs/pathways of nitrogen from sewage associated with existing farms and scattered residential dwellings. A detailed assessment of current residential nitrogen loadings has been conducted as per Stage 1 above; and,
- For urban land-uses (residential and commercial) within the area under the applicant's control, which are not covered by Farmscoper, appropriate nutrient loss values have been identified using the nutrient loss rates contained within the NE guidance.

The findings of the baseline establishment are identified in the following Appendices:

- Appendix 1: GIS Parcels identifying split of the site under the applicant's control and relevant parcels for Quobleigh Breach and wider land within the applicant's control and associated Agricultural Summaries;
- Appendix 2: Field Observations from Site Walkover;
- Appendix 3: Farmer Interview Notes;
- Appendix 4: ADAS Farmscoper Inputs & Outputs;
- Appendix 5: Sustainable Drainage System (SuDS) network.

With reference to Appendix 1, the Quobleigh Breach development will take place on Land Parcels 0.1, 0.2, 2, 3, 4, 8, 25, 26 & 27 and totals and area of 7.02 ha.

2.2.3.1. Phosphorus Methodology

The P loading from the baseline site has been calculated as per NE guidance⁴, published 28 February 2024, last updated 27 May 2025. The approach for P differs to the N approach in that

there was insufficient time for the P aspects of the Farmscoper modelling to undergo ADAS peer review, and therefore the revised standard NE approach was adopted. Using the site parcels established through GIS, as per the N methodology above, each land parcel in the site has been attributed an appropriate land use class within the methodology according to the land use identified in the walkover survey and conversations with farmers.

As with the N methodology above, P inputs from baseline residential properties have been included within the baseline as a product of the resident population and the corresponding wastewater generation.

2.2.3.2. Nutrient Calculator

As a bespoke approach is being taken for nutrient neutrality and the impact of the scheme is being considered alongside land within the applicant's control, a bespoke tracker has been set up using Excel to record the baseline habitat removed/altered. The baseline for Quobleigh Breach and wider land within the applicant's control are provided in Appendix 1 and, in order to provide supporting information for tracking of changes to land within the applicant's control, Appendix 5.

2.2.4. Stage 3: Development Land Use Losses

The development site areas have been identified according to their primary use, with Quobleigh Breach delivery comprising a split of residential urban land (5.72 ha) and open space (1.30 ha). Nutrient loss rates for the post-development land uses have been applied to the areas using the up to date site specific NE Guidance values, with residential loss rates of 15.38 kg TN/ha and 1.65 kg TP/ha and greenspaces loss rates of 3.00 kg TN/ha and 0.02 kg TP/ha.

2.2.5. Stage 4: Sustainable Drainage Systems

As part of the development proposals, a network of SuDS features is proposed comprising basins, swales and ponds to sustainably manage runoff from the scheme, as identified in Appendix 6. As illustrated in these drawings, it is intended that the proposed SuDS features incorporate permanently wet areas around inlets (sediment forebays), outlets (secondary sedimentation areas) and wetland areas within the base of the features.

As such, the SuDS will provide a "SuDS management train" and comply with the following CIRIA guidance:

- CIRIA C815F: Using SuDS to reduce nitrogen in surface water runoff, 2023; and
- CIRIA C808: Using SuDS to reduce phosphorous in surface water runoff, 2022.

Therefore, TN & TP removal efficiencies of 30 % and 50 %, respectively should be confidently achieved by the SuDS in runoff from the Quobleigh Breach scheme.

The developed area is served by two SuDS catchments, namely:

- Catchment A – draining to the basin to the NW of the site. The catchment area is 2.297 ha, with 2.037 ha with an assumed percentage impermeability of 65% and 0.260 ha with an assumed percentage impermeability of 100%; and

- Catchment E – draining to the basin to the SW of the site. The developed catchment area is 4.032 ha, with 3.650 ha with an assumed percentage impermeability of 65% and 0.382 ha with an assumed percentage impermeability of 100%.

2.2.6. Stage 5: Net Change in Nutrient Loading

The net change in N and P loading as a result of the development site, considering the post-development wastewater and land-use nutrient losses against the pre-development wastewater and land-use nutrient losses, is undertaken in line with the latest NE Guidance. Where the development results in an additional nutrient load to the European Designated Sites, a precautionary buffer of an additional 20% is applied to the result in line with the NE Guidance.

3. Results

3.1. Stage 1: Development Wastewater Loading

The annual pre-2030 N and P loading resulting from wastewater generation from the residential properties in Quobleigh Breach are **207.10 kg TN/yr** and **4.47 kg TP/yr**, as identified in Table 3.1.

The annual post-2030 N and P loading resulting from wastewater generation from the residential properties in Quobleigh Breach are **178.38 kg TN/yr** and **5.57 kg TP/yr**, as identified in Table 3.2.

Table 3.1 Pre-2030 Nutrient Loading from Operational Wastewater Generation

		Nitrogen	Phosphorus
Step 1	Homes (No.)	90	90
	Average Occupancy Rate (persons/dwelling)	2.4	2.4
	Residents (No.)	216	216
Step 2	Water usage (l/person/day)	105	105
	Wastewater Volume Generated (l/person/yr)	38,351	38,351
	Wastewater Volume Generated (l/yr)	8,283,870	8,283,870
Step 3	Chickenhall Eastleigh WwTW Permit (mg /l)	27.0	0.60
	Discharge permit with allowance for potable water removal (mg/l)	25.0	0.60
	Operation at 90 % of the permit limit (mg/l)	N/A	0.54
	Nutrient Discharge mg/yr	207,096,750	4,473,290
	kg/year	207.10	4.47

Table 3.2 Post-2030 Nutrient Loading from Operational Wastewater Generation

		Nitrogen	Phosphorus
Step 1	Homes (No.)	269	269
	Average Occupancy Rate (persons/dwelling)	2.4	2.4
	Residents (No.)	646	646

		Nitrogen	Phosphorus
Step 2	Water usage (l/person/day)	105	105
	Wastewater Volume Generated (l/person/yr)	38,351	38,351.25
	Wastewater Volume Generated (l/yr)	24,774,746	24,774,746
Step 3	Chickenhall Eastleigh WwTW Permit (mg /l)	10.0	0.25
	Discharge permit with allowance for potable water removal (mg/l)	8.0	0.25
	Operation at 90 % of the permit limit (mg/l)	7.2	0.225
	Nutrient Discharge	mg/yr	178,378,171
		kg/year	178.38
			5.57

3.2. Stage 2: Baseline Nutrient Losses

The annual N and P loading from baseline land uses within Quobleigh Breach are **129.42 kg TN/yr** and **6.59 kg TP/yr**, as identified in Table 3.3.

Table 3.3 Baseline Nutrient Loading Pre-Development

Parcel	Area (ha)	Use	Nitrogen		Phosphorus	
			Output/ha (kg)	Total Output (kg)	Output/ha (kg)	Total Output (kg)
0.1	0.23	Urban (U)	15.38	3.51	1.65	0.38
0.2	0.04	Urban (U)	15.38	0.55	1.65	0.06
2	0.52	Urban (U)	15.38	7.97	1.65	0.85
3	0.19	Urban (U)	15.38	2.92	1.65	0.31
4	0.14	Fallow (F)	25.33	3.60	0.73	0.10
8	1.54	Fallow (F)	25.33	38.96	0.73	1.12
25	0.64	Urban (U)	15.38	9.80	1.65	1.05
26	3.58	Rotational Grassland (RG)	17.34	62.11	0.73	2.61
27	0.15	Fallow (F)	25.33	3.77	0.73	0.11
Total				129.42		6.59

3.3. Stage 3: Post-Development Land Use Losses

The annual N and P loading from post-development land uses within Quobleigh Breach are **101.39 kg TN/yr** and **10.47 kg TP/yr**, as identified in Table 3.4.

Table 3.4 Post-Development Land-Use Nutrient Loading

Land Use	Area (ha)	Nitrogen		Phosphorus	
		Output/ha (kg)	Total Output (kg)	Output/ha (kg)	Total Output (kg)
Residential Urban	6.34	15.38	97.49	1.65	10.46
Greenspace	0.68	2.04	3.90	0.02	0.01
Total			101.39		10.47

3.4. Stage 4: Sustainable Drainage Systems

The annual N and P removal from post-development runoff by SuDS within Quobleigh Breach are **20.02 kg TN/yr** and **3.58 kg TP/yr**, as identified in Table 3.5.

Table 3.5 Removal of N & P by SuDS

Catchment	Area (ha)	Land Use & (% impermeability)	Annual P inputs to SuDS (kg TP/yr)	Annual N inputs to SuDS (kg TN/yr)	N removal rate (%)	P removal rate (%)	Annual P removed by SuDS (kg TP/yr)	Annual N removed by SuDS (kg TN/yr)
Catchment A	2.037	Residential Urban (65%)	3.36	31.32	30.0	50.0	1.09	6.11
	0.260	Residential Urban (100%)	0.43	4.00	30.0	50.0	0.21	1.20
Catchment E	3.650	Residential Urban (100%)	6.03	56.13	30.0	50.0	1.96	10.95
	0.382	Residential Urban (100%)	0.63	5.87	30.0	50.0	0.32	1.76
Total							3.58	20.02

3.5.

3.5. Stage 4: Net Change in Nutrient Loading

Pre-2030, the net changes in annual N and P loadings as a result of Quobleigh Breach are **190.86 kg TN/yr** and **5.72 kg TP/yr**, incorporating the 20% precautionary buffer as identified in Table 3.6.

Post-2030, the net changes in annual N and P loadings as a result of Quobleigh Breach are **156.40 kg TN/yr** and **7.04 kg TP/yr**, incorporating the 20% precautionary buffer as identified in Table 3.6.

These values are the volumes of N and P that require mitigation for the Quobleigh Breach scheme to demonstrate delivery of nutrient neutrality.

Table 3.6 Net Change in Nutrient Loading as a result of Quobleigh Breach

Nutrient		Pre-Development Baseline Losses (kg)	Post-Development Losses (kg)			SuDS Removal (kg)	Net Change (kg)	Net Change plus Pre-cautionary Buffer (kg)
			Waste water	Land-use	Total			
N	Pre-2030	129.42	207.10	101.39	308.49	20.02	159.05	190.86
	Post-2030	129.42	178.38	101.39	279.77	20.02	130.33	156.40
P	Pre-2030	6.59	4.47	10.47	14.94	3.58	4.47	5.72
	Post-2030	6.59	5.57	10.47	16.04	3.58	5.87	7.04

4. Mitigation Measures

There are a range of measures available to mitigate the increase in N and P loss associated with the Quobleigh Breach scheme. The following identifies the mitigation measures that we have incorporated to deliver nutrient neutrality for the development proposal:

- N & P benefits brought forward from the Upper Acre phase of the development; and
- Temporary offsetting nutrient losses from land changes associated with land within the Applicant's control during the pre-2030 phase.

It should be noted that offsetting through a purchase of nutrient credits from EBC will only be required for later phases and is not relevant for this Reserved Matters application.

The application of these mitigation measures are discussed in turn below until neutrality is achieved for the Quobleigh Breach scheme.

4.1. Benefit/disbenefit from the Upper Acre Scheme

With reference to the Hilson Moran report: "Nutrient Neutrality Study, One Horton Heath: Upper Acre" (23 October 2025, Issue P02.01, HM Ref.: 37245-HML-XX-XX-RP-U-870001), post-2030 N & P benefits of **578.37 kg N/yr** and **10.59 kg P/yr** are carried forward to other phases of the OHH masterplan from the Upper Acre Reserved Matters scheme.

These benefits have, therefore, been carried over to the Quobleigh Breach scheme for the post-2030 scenario, as presented in Table 4.1 below.

Table 4.2 Post-2030 Nutrient Balance for the Quobleigh Breach Scheme with Mitigation

Mitigation	Nitrogen (kg TN/yr)	Phosphorus (kg TP/yr)
Impact (from Stages 1-5 above)	130.33	5.87
Benefit brought forward from Upper Acre scheme	-578.37	-10.59
Nutrient Neutrality Balance	-448.04	-4.72
Nutrient Neutrality Balance including 20 % buffer where appropriate	-448.04	-4.72

The results of this exercise demonstrate better than nutrient neutrality for N & P in the post-2030 scenario, with benefits of **448.04 kg N/yr** and **4.72 kg P/yr**.

With regard to the pre-2030 deficits of **190.86 kg N/yr** and **5.72 kg P/yr**, Section 4.2 below demonstrates that N and P-neutrality can be maintained pre-2030, through temporary land change measures.

4.2. Temporary On-Site Offsetting

A number of development packages on land within the applicant's control, whilst outside of the Quobleigh Breach, have resulted in changes to the extent of farmland both on the site and in the

surrounding area. The loss of farming practices to these areas have resulted in changes to the nutrient inputs into the catchment that, as non-residential developments, have not been captured. Further to this, residential properties within the land under the applicant's control have been vacated early in the wider development, and therefore the benefits can be captured early.

In order to manage and track the changes to land within the applicant's control and identify the changes that have been considered in the neutrality assessment a nutrient (and sediment) tracking tool has been created that maps the removal of residential properties and land parcels for development and allows these to be assessed against the planning application being brought forward.

Therefore, for the Quobleigh Breach application, the following measures have been included in the baseline tracking tool (included in Appendix 5):

- As described in the Hilson Moran report: "*Nutrient Neutrality Study, One Horton Heath: Upper Acre*" (29 October 2025, Issue P02, HM Ref.: 35961-HML-XX-XX-RP-U-870001), temporary pre-2030 conversion of 6 ha of parcel 33 from agriculturally managed land to greenspace during construction of Upper Acre dwellings on the remainder of the plot (*i.e.* parcels 32, 34, 0.7 and the rest of parcel 33).
- Temporary pre-2030 conversion of 3.58 ha of parcel 26 from agriculturally managed land to greenspace during construction of Quobleigh Breach dwellings on the remainder of the plot (*i.e.* parcels 0.1, 0.2, 2, 3, 4, 8, 25, and 27).

When the pre-2030 deficit from Upper Acre is accounted for, the above measures will result in total annual N and P reductions of **238.17 kg TN/yr** and **6.85 kg TP/yr** for the period prior to 2030.

Consequently, when this temporary mitigation is taken into account it ensures better than nutrient neutrality for N & P loadings, with benefits of **79.12 kg N/yr** and **2.38 kg P/yr**, prior to 2030. The calculation for this is presented in Table 4.1.

Table 4.1 Pre-2030 Nutrient Balance for the Quobleigh Breach Scheme with Mitigation

Mitigation	Nitrogen (kg TN/yr)	Phosphorus (kg TP/yr)
Pre-2030 Quobleigh Breach Impact (from Stages 1-5 above)	159.05	4.47
Remainder of benefit carried over, due to temporary change to greenspace for parcels 12, 13, 14 & 15, assuming offset for 33 % of Upper Acre dwellings (141) occupied pre-2030*	-183.36	-4.31
Temporary change to greenspace for parcel 26	-54.81	-2.54
Nutrient Neutrality Balance	-79.12	-2.38

*Refer to Table 4.2 of Hilson Moran report: "*Nutrient Neutrality Study, One Horton Heath: Upper Acre*" (29 October 2025, Issue P02, HM Ref.: 35961-HML-XX-XX-RP-U-870001)

As better than N & P neutrality can be demonstrated for both the pre- and post-2030 scenarios for the Quobleigh Breach scheme, no further mitigation measures need to be identified for this phase of the OHH development.

The above post-2030 N & P benefits of **448.04 kg N/yr** and **4.72 kg P/yr** will be carried forward to other parcels of the OHH masterplan (such as The Holme & Homestal Reserved Matters scheme) and offset against other development parcels on the site as part of the overall mitigation package.

It should be noted that the remaining pre-2030 benefits of **79.12 kg N/yr** and **2.38 kg P/yr** would still be enough to offset a further 33 completed and occupied dwellings, either within the Upper Acre or Quobleigh Breach schemes. As such, there is plenty of headroom in the calculations to permit higher rates of pre-2030 completion and occupation than the predicted 33%, if required. In the unlikely event that this figure of 264 dwellings (*i.e.* 141 from Upper Acre, 90 from Quobleigh Breach and 33 additional dwellings from either) completed and occupied by 2030 is desired or exceeded, then it is anticipated that additional agricultural-to-greenspace conversion across the OHH development would readily facilitate any further short-term offset requirements. All other phases of the OHH scheme are scheduled for first completions and occupations to happen post-2030.

5. Summary and Conclusion

The aim of this Nutrient Neutrality Study is to provide a robust assessment of the impact of the development on N and P losses into the River Itchen catchment and demonstrate how, through the application of appropriate mitigation measures, the Quobleigh Breach scheme can deliver nutrient neutrality. The findings of the study will support EBC, as the competent authority under the Habitat Regulations, in the completion of an appropriate assessment of whether the scheme adversely affects the integrity of the European Designated Sites associated with the River Itchen and Solent.

The report provides a summary of the evidence gathered to support the Nutrient Neutrality Study together with the neutrality calculations for the scheme and effect of appropriate mitigation measures proposed for inclusion within the scheme.

Incorporating a 20 % buffer for nutrient losses as per NE guidance, the Quobleigh Breach development is identified to give rise to:

- **190.86 kg N/yr** deficit pre-2030;
- **156.40 kg N/yr** deficit post-2030.
- **5.72 kg TP/yr** deficit pre-2030;
- **7.04 kg TP/yr** deficit post-2030.

The following mitigation measures are proposed to deliver nutrient neutrality in the Quobleigh Breach scheme:

- N & P benefits brought forward from the Upper Acre phase of the development (*i.e.* pre-2030 benefits of **183.36 kg N/yr** and **4.31 kg P/yr** from temporary land use changes during construction and post-2030 benefits of **578.37 kg N/yr** and **10.59 kg P/yr**); and
- Temporary offsetting nutrient losses from land changes associated with land within Quobleigh Breach red line boundary during the pre-2030 phase.

Following inclusion of the above N & P benefits brought forward from the Upper Acre phase of the development, it is demonstrated that better than nutrient neutrality for N & P in the post-2030 scenario can be achieved. The results of this exercise demonstrate better than nutrient neutrality for N & P in the post-2030 scenario, with benefits of **448.04 kg N/yr** and **4.72 kg P/yr**.

With regard to the pre-2030 deficits of **190.86 kg N/yr** and **5.72 kg P/yr**, N and P-neutrality can be maintained pre-2030, through temporary land change measures, comprising:

- Temporary pre-2030 conversion of 6 ha of parcel 33 from agriculturally managed land to greenspace during construction of Upper Acre dwellings on the remainder of the plot (*i.e.* parcels 32, 34, 0.7 and the rest of parcel 33).
- Temporary pre-2030 conversion of 3.58 ha of parcel 26 from agriculturally managed land to greenspace during construction of Quobleigh Breach dwellings on the remainder of the plot (*i.e.* parcels 0.1, 0.2, 2, 3, 4, 8, 25, and 27).

When this temporary mitigation is taken into account it ensures better than nutrient neutrality for N & P loadings, with benefits of **79.12 kg N/yr** and **2.38 kg P/yr**, prior to 2030.

As better than N & P neutrality can be demonstrated for both the pre- and post-2030 scenarios for the Quobleigh Breach scheme, no further mitigation measures need to be identified for this phase of the OHH development.

The above post-2030 N & P benefits of **448.04 kg N/yr** and **4.72 kg P/yr** will be carried forward to other parcels of the OHH masterplan (such as The Holme & Homestall Reserved Matters scheme) and offset against other development parcels on the site as part of the overall mitigation package.

It should be noted that the remaining pre-2030 benefits of **79.12 kg N/yr** and **2.38 kg P/yr** would still be enough to offset a further 33 completed and occupied dwellings, either within the Upper Acre or Quobleigh Breach schemes. As such, there is plenty of headroom in the calculations to permit higher rates of pre-2030 completion and occupation than the predicted 33%, if required. In the unlikely event that this figure of 264 dwellings (*i.e.* 141 from Upper Acre, 90 from Quobleigh Breach and 33 additional dwellings from either) completed and occupied by 2030 is desired or exceeded, then it is anticipated that additional agricultural-to-greenspace conversion across the OHH development would readily facilitate any further short-term offset requirements. All other phases of the OHH scheme are scheduled for first completions and occupations to happen post-2030.