The Old Mill
Knightsmill
St Teath
PL30 3JE

50.593622 -4.727069

Phosphate Neutrality Assessment

S23-882/PNA
June 2023

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On behalf of :

Mr and Mrs Shearwood
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APPENDICES

1.0 Introduction

Southwest Environmental Limited was commissioned by Mr and Mrs Shearwood, to produce a Phosphate Neutrality Assessment for the proposed development at The Old Mill.

2.0 The Site

The property comprises three separate buildings. Two of these dwellings are known as “The Bungalow” and “The Stables”. The third dwelling, “The Old Mill” is where the family currently reside.

Currently there are two separate buildings a 3 Bedroom “The Old Mill” and a 2 bedroom “The Stables”. These will be joined together by an extension to create one single dwelling that will consist of a combination of timber, Glass, slate and granite. The finished house will have 5 bedrooms (no additional bedrooms).

For site area calculation purposes we have assumed built area only, as the remaining landscaping will be left unchanged in term of classification. Considered site area will be “low density urban” before and after proposal.

3.0 Background

Recent CJEU Dutch Nitrogen case law relating to impacts of nutrient laden water impacting on sensitive ecological sites, has highlighted a requirement to mitigate against effluent out flows from proposed developments.

The application site falls within the catchment flowing into the River Camel Special Area of Conservation (SAC), designated for its rare aquatic invertebrates. There is a major issue with nutrients entering watercourses which adversely changes environmental conditions for these species.

Any new housing, including single dwellings, will result in an increase in phosphates contained within water discharge. As the designated site is in ‘unfavourable’ condition any increase, including from single dwellings, is seen as significant, either alone or in combination with other developments.

Whilst this report is not a Habitats Regulation Assessment, it would be the principal piece of information used to guide the outcome of a Habitats Regulations Assessment. A Habitats Regulation Assessment would screen for affected sites of high importance, which might be influenced by the project.

In this instance we are dealing with cumulative impacts, as the individual impact from this project would be unmeasurable at the receptor location, which is approximately 10 miles downstream of the proposal.

The receptor has been identified as River Camel Special Area of Conservation (SAC), the substance of concern is Phosphate. A mitigative response to phosphates arising from the proposed development is suggested within this report.

Most aquatic systems are naturally low in biologically available Phosphate. So, when Phosphate availability increases, aquatic plants tend to grow rapidly and cause degradation of water quality (e.g. algal blooms).

4.0 Scope

In order to complete a Habitats Regulations Assessment Natural England require a calculated response for mitigation i.e. information on how additional Phosphate from foul water is to be dealt with.

> *"Natural England advise that mitigation will need to be identified and secured by the applicant in order to complete the* [NE's] *Habitats Regulations Assessment."*

In previous correspondence further advice has been given regards to mitigation:

> *"Alternatively an applicant may source their own mitigation. For Package Treatment Plant this can be a small wetland, specifically designed to remove phosphates, its area depending on the amount of phosphate kilograms produced form the proposed development per year."*

5.0 Impact Assessment

The potential impacts from the project are now reviewed based on the Source, Pathway, Receptor Model.

5.1 Source

There are numerous sources of phosphate that contribute to phosphorous found in domestic waste water[1].

[1] https://www.sepa.org.uk/media/163158/crew_septic_tanks.pdf

Table 5 Source apportionment of P in raw domestic waste water (Defra 2008)	
Source	Contribution
Faeces	23%
Urine	41%
Food waste	5%
Mains supply (phosphate added to reduce lead in drinking water)	5%
Toothpaste	1%
Dishwasher detergent	7%
Laundry detergent	18%

In October 2021 Cornwall Council released their Phosphate Budget Calculator[2], which indicates a budget of 0.99kg/phosphate/year per person.

We have modelled the site as 2 dwellings (existing) and 1 dwelling (proposed). Calculations are shown in **Appendix 2.**

5.2 Pathway

The pathway from site, to receptor is via lateral drain, to the onsite septic tank. Effluent from the system then flows to a drainage field, ground water supports seasonal flow of rivers and tributaries near site where it will join the River Camel.

5.3 Receptor

The receptor of principal concern is River Camel Special Area of Conservation. Within this area various locations are of national and internationally significance for wildlife under the Habitat Regulations 2017.

Natural England have recently started to advise regarding the high levels of phosphates in the River Camel Special Area of Conservation.

In light of a court Judgement (known as Dutch N), Natural England have advised District and County Councils that, in light of the unfavorable condition of the River Camel Special Area of Conservation Site, before determining a planning application that may give rise to additional phosphates within the catchment, competent authorities should undertake a Habitats Regulations Assessment (HRA).

[2] https://ssccust1.spreadsheethosting.com/1/4a/53604950897bb7/Phosphate_Calc_1.1.1/Phosphate_Calc_1.1.1.htm

6.0 Mitigation

The proposed scheme will not require mitigation as it will reduce overall Phosphorus loadings from the application site.

Both existing and proposed schemes will drain to the existing onsite septic tank. Standing advice from Natural England is that an efficiency of 55% should be used. We have converted this to a concentration using calculations as shown in **Appendix 3**.

6.1 Existing Budget

The existing site stage 4 budget is **2.05 kg/p/year.** This accounts for 2 no. Dwellings on a septic tank, set on 0.029ha of low density urban land before and after development.

6.2 Proposed Budget

The proposed budget is **1.02 kg/p/year**. In combining two small dwellings to create 1 larger dwelling there is a reduction in emissions. This is because the Phosphorous Budget Calculator allows up to 6 bedrooms per dwelling. And as such the 5 bed room dwelling that is created will count as a single dwelling.

6.3 Budget Result

The project budget is therefore **-1.03kg/p/year.** The development is Phosphorous Neutral and creates a phosphorous credits of -1.03kg/p/year.

6.4 Phosphorus Credit

The credits generated under this scheme will be certified and administered by Nutrient Credits Limited, under scheme P004[3].

7.0 Private Drainage vs Mains

There is a preference in terms of drainage planning to connect to mains drainage as opposed to using private drainage on site. However, by promoting connections to sewers planning authorities are knowingly causing environmental degradation.

Many of the sewerage undertakers such as Southwest Water or Wessex Water are in management of Sewage Treatment Assets that are decades past their serviceable life span. Not only in terms of the technology they employ, but there capacity, which was designed for 1970's population levels. There are now 17,000,000 million more people living in the UK. More importantly impermeable surfaces drained to foul sewer have increased dramatically.

The majority of Sewage Treatment Networks in the UK operate Combined Sewer Overflows (CSOs). These were originally designed to divert very heavy flows around the treatment system, in the case of very heavy rainfall.

[3] https://sites.google.com/view/www-nutrient-credits-uk/nutrient-credits/cornwall/scheme-p004

Increases in rainfall intensity owing to climate change, and increases in paved areas, coupled with little or no expansion in capacity at Sewage Treatment Works leads to the frequent, and in some case near constant discharge (250 days a year) of raw untreated sewage in to Rivers and Seas. This not only side steps discharge consent limits for phosphates but results in raw sewage with it associated BOD, COD, Coliform Load, entering Rivers and Sea. In addition to this we are now learning about the impact of plastics contained in sewage on Fluvial and Marine ecosystems.

A great many plastics contain Phthalates[4] which are a softening agent commonly used in many flexible plastics. They are an endocrine disruptor and are causing fertility problems in a wide range of Marine and Fluvial organisms. Phthalates are environmentally persistent chemicals much like DDT and PCBs. They concentrate up the food chain causing sterility[5] and deformity in higher predators, including humans.

During operation of a Combined Sewer Overflow, all Marco plastics contained in sewage are released to Rivers and Sea: Dental Floss, Condoms, Cotton Buds, Plastic Wrappings, Wet Wipes, Sanitary Towels, Tampons and Tampon Applicators. All end up in the river tangled around low braches or washed up on beaches. Where they degrade in to trillions of micro and Nano plastic particles.

By using an on-site private drainage, the sewage producer (occupant) becomes responsible for its proper operation and maintenance. We fully expect them to meet their obligation more fully than the average Sewerage Undertaker in the UK. The existing system only handles foul water and will not overflow during heavy rainfall.

The correct way in which to dispose of the sludge, collected from the septic tank is an important point. We would recommend that the tankered waste is disposed of at a dewatering plant, where all sludge is recovered, and disposed to landfill.

8.0 Conclusions

The proposal as described above would result in a Phosphate Neutral Development.

9.0 Limitations

For the avoidance of doubt, the parties hereby expressly agree that the Consultant takes no liability for and gives not warranty against actual flood, sewage, nutrient or water damage of The Client's property, or natural environment in relation to the performance of the service.

This report gives estimates of likely flows and occupancy number, but does not accept liability associated for the use of these figures in the construction of sewers or drains. Options appraisals are given as example only. Responsibility for design / services and resulting levels of performance rests with the client and or developer.

[4] https://www.theguardian.com/society/2021/mar/28/shanna-swan-fertility-reproduction-count-down
[5] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1280349/

This report is produced for the sole use of the Client, and no responsibility of any kind, whether for negligence or otherwise, can be accepted for any Third Party who may rely upon it.

The conclusions and recommendations given in this report are based on our understanding of the future plans for the site.

The scope of this report was discussed and agreed with the Client. No responsibility is accepted for conditions not encountered, which are outside of the agreed scope of work.

APPENDIX 1

Plans


Areas Considered in Phosphorous Caculations (Green Dash)
The Stables
The Old Mill
Bungalow

APPENDIX 2

Phosphate Budget Calculator

Existing & Proposed

Stage 1 to 4 Budget Caculation for Exisiting 2 Houses Budget = 2.05 kg

Stage 1 **Calculate nutrient load (Kg/year) derived from the development as a result of increased population**

*Note: This calculation should only include the **additional** units resulting from the proposed development, including any development that will result in overnight accommodation. For land not currently in residential use, this will be the total units proposed by the development. However, for land already in residential use, this should only be the increase in units.*

1. Calculate the additional population	Value	Unit
Number of dwellings proposed	2	dwellings
Average occupancy	1.93	persons/dwelling
Number of **additional** rooms above 6 residents (sui generis) for houses in multiple occupation		dwellings
Average occupancy	1.93	persons/dwelling
Number of rooms in a hotel or guest house proposed		dwellings
Average occupancy	1.93	persons/dwelling
Number of weeks open per year (1-52)		Weeks
Average occupancy rate (1-100)		%
Total population increase generated by the development	**4**	**Persons**

2. Wastewater volume generated		
Water use per person	**110**	Litres/person/day
Wastewater volume generated by the development	**425**	**Litres/day**

Please select how the sewage from the proposed development will be handled, noting that a development must be handled by either wastewater treatment plants or onsite treatment plant, and cannot be handled by both. Consideration of wastewater loading is not required where a site drains to a wastewater Treatment Works that does not drain in to the River Camel catchment.

Is sewage to be handled by wastewater treatment works? No

Is sewage to be handled by Onsite treatment plants? Yes

3a. TP budget that would exit the Wastewater Treatment Works (WwTW) after treatment

Note: If the sewage is to be treated by wastewater treatment plants then the user should select "Yes" in the list above. If package treatment plants are to be used instead, then the user should select "No" above.

This is the process of collecting wastewater from houses and guiding it, via the sewage network, to WwTW (also known as sewage works). The nutrient concentration of the influent is calculated by multiplying the number of people by the expected water usage per day. The nutrient concentration within the effluent is calculated by applying the discharge level of the appropriate WwTW. The nutrient loading is expressed in kg/year.

Confirm receiving WwTW and discharge level	Value	Unit
Select the WwTW the development will connect to	Blisland	
	Current discharge	
Phosphorus WwTW discharge level	5.00	mg/l

Note: Please use the drop down lists to select the WwTW that the proposed development will be connected to. If the WwTW is not known, then please select 'Unknown' from the drop down list.

3b. TP budget for Onsite treatment plants

Note: If the sewage is to be treated by on-site treatment plants then the user should select "Yes" in the list above. If wastewater treatment works are to be used instead, then the user should select "No" above.

On-site treatment plants are pre-manufactured treatment facilities used to treat wastewater in smaller communities or on individual properties. This concept is defined as decentralized wastewater treatment. The nutrient influent is calculated by multiplying the number of people by the expected loading per person. The nutrient effluent is calculated by applying the reduction efficiency. The nutrient loading is expressed in kg/year.

Calculate nutrient load after treatment	Value	Unit
Select the type of On-site treatment works	Septic tank	
Phosphorus discharge level	Please enter effluent 11.00	mg/l

Note: The user must input the reduction efficiency of the PTP. The efficiency of the PTP used must be evidenced. The evidence should include the test result documents from the lab (in English) and/ or measured effluent concentrations from real world applications. If the efficiency is unknown then a precautionary default value can be used

Calculate the nutrient load discharged by the WwTW	Value	Unit
	Current discharge	
TP discharged by WwTW	0.00	kg/year

Calculate loading from wastewater with Onsite treatment plants	Value	Unit
TP discharged by on-site treatment plant	1.71	Kg/year

4. Additional population load	Value	Unit
	Current	
TP load from additional population	**1.71**	**Kg/year**

Stage 2 **Calculate existing (pre-development) TP from current land use of the development**

Note: Where development sites include existing areas that are to be retained, these areas can be excluded from the calculations in both Stages 2 and 3.

1. Identify current land uses of the development site

Select the soil drainage type: Freely draining

Note: Use the criteria table in the Help tab to identify if the soil type

2. Select the existing land use type(s)

	Value	Unit	TP loading	
High density urban		Hectares	0.00	Kg/yr
Medium density urban		Hectares	0.00	Kg/yr
Low density urban	0.029	Hectares	0.01	Kg/yr
Commercial / Industrial		Hectares	0.00	Kg/yr
Urban open space		Hectares	0.00	Kg/yr
Dairy		Hectares	0.00	Kg/yr
Lowland grazing		Hectares	0.00	Kg/yr
Mixed		Hectares	0.00	Kg/yr
Poultry		Hectares	0.00	Kg/yr
Pigs		Hectares	0.00	Kg/yr
Horticulture		Hectares	0.00	Kg/yr
Cereals		Hectares	0.00	Kg/yr
General Arable		Hectares	0.00	Kg/yr
LFA		Hectares	0.00	Kg/yr
Allotments and city farms		Hectares	0.00	Kg/yr
Woodland (e.g. conifer, mixed, broad-leaved)		Hectares	0.00	Kg/yr
Greenspace		Hectares	0.00	Kg/yr

shrub / heathland / bracken / bog		Hectares	0.00	Kg/yr
Water		Hectares	0.00	Kg/yr
Sum total	**0.029**	**Hectares**	**0.01**	**Kg/yr**

3. Calculate loading from current land usage

	Value	Unit
TP load from proposed land usage	**0.01**	**Kg/yr**

Stage 3 **Calculate TP for the proposed development**

Note: This section should include all land uses within the proposed development. Where the proposed scheme is to create new wetlands, woodlands, nature reserves, etc. within the development site area, then this should be included within this section. Any offsite mitigation should not be included below, and should instead be inputted in the mitigation tabs *(if mitigation is required).*

2. Identify proposed land uses of the development site	Value	Unit
High intensity urban land		Hectares
Medium intensity urban land		Hectares
Low intensity urban land	0.029	Hectares
Commercial / industrial urban land		Hectares
Open Space urban land		Hectares
Allotments and city farms		Hectares
Woodland (e.g. conifer, mixed, broad-leaved)		Hectares
Greenspace		Hectares
shrub / heathland / bracken / bog		Hectares
Water		Hectares

3. Designed Wetlands / SuDS		
Wetland / SuDS area		Hectares
TP Banking coefficient		Kg/ha/year

Note: Please input the banking coefficient (i.e. wetland removal rate in kg/ha/yr) calculated for the designed wetland / SuDS. The calculated value should be justifiable with supporting evidence.

Sum total of land uses	**0.029**	**Hectares**

Note: The sum total of land uses must equal the development site area inputted in Stage 2 - the box will colour red if the areas do not match. Wetland refers to specific wetland off a watercourse - for more information refer to the land use definitions in the help tab.

4.	Calculate loading from proposed land usage	Value	Unit
	TP load from proposed land usage	**0.01**	**Kg/year**

Stage 4 **Calculate the net change in nutrient load from the proposed development**

Note: This stage calculates the net change in TP load to the catchment from the proposed development. This is derived by calculating the difference between the load calculated for the proposed development (wastewater, urban area, open space etc.) and that for the existing land uses. The nutrient budget for the site has been calculated under current and post 2025 WwTW permit levels where applicable

		Current		Summary	
				No. of dwellings	2
1.	Identify the load from additional population	Value	Unit	Onsite treatment plant	Septic tank
				Current discharge concentration	11
	TP Loading from additional population	**1.71**	**Kg/year**		
2.	Calculate net change in nutrient load from land use change	Value	Unit	TP current land use	0.01
	TP load from land use change	**0.00**	**Kg/year**	TP proposed land use	0.01
3.	Calculate nutrient budget for the development site	Value	Unit		
	TP budget for the site	**1.71**	**Kg/year**		
4.	Calculate precautionary buffer	Value	Unit		
	Buffer amount	20	%		
	TP Precautionary buffer	**0.34**	**Kg/year**		

Note: The figures used throughout this model are based on scientific research, evidence and modelled catchments and represent the best available evidence. However, it is important that a precautionary buffer is used that recognises the uncertainty with these figures and ensures, with reasonable certainty, that there will be no adverse effect on site integrity. As such, a 20% precautionary buffer is added to the budget calculations.

5.	**Total nutrient budget for the development site**	Value	Unit
	Total Phosphorus budget for the site	**2.05**	**Kg/year**

Current WwTW Permit levels

Development will generate additional Phosphorus (Mitigation required) - Please progress toMitigation - currenttab

Stage 1 to 4 Budget Caculation for Proposed 1 House Budget = 1.02 kg

Stage 1 **Calculate nutrient load (Kg/year) derived from the development as a result of increased population**

*Note: This calculation should only include the **additional** units resulting from the proposed development, including any development that will result in overnight accommodation. For land not currently in residential use, this will be the total units proposed by the development. However, for land already in residential use, this should only be the increase in units.*

1. Calculate the additional population	Value	Unit
Number of dwellings proposed	1	dwellings
Average occupancy	1.93	persons/dwelling
Number of **additional** rooms above 6 residents (sui generis) for houses in multiple occupation		dwellings
Average occupancy	1.93	persons/dwelling
Number of rooms in a hotel or guest house proposed		dwellings
Average occupancy	1.93	persons/dwelling
Number of weeks open per year (1-52)		Weeks
Average occupancy rate (1-100)		%
Total population increase generated by the development	**2**	**Persons**

2. Wastewater volume generated		
Water use per person	**110**	Litres/person/day
Wastewater volume generated by the development	**212**	**Litres/day**

Please select how the sewage from the proposed development will be handled, noting that a development must be handled by either wastewater treatment plants or onsite treatment plant, and cannot be handled by both. Consideration of wastewater loading is not required where a site drains to a wastewater Treatment Works that does not drain in to the River Camel catchment.

Is sewage to be handled by wastewater treatment works? No

Is sewage to be handled by Onsite treatment plants? Yes

3a. TP budget that would exit the Wastewater Treatment Works (WwTW) after treatment

Note: If the sewage is to be treated by wastewater treatment plants then the user should select "Yes" in the list above. If package treatment plants are to be used instead, then the user should select "No" above.

This is the process of collecting wastewater from houses and guiding it, via the sewage network, to WwTW (also known as sewage works). The nutrient concentration of the influent is calculated by multiplying the number of people by the expected water usage per day. The nutrient concentration within the effluent is calculated by applying the discharge level of the appropriate WwTW. The nutrient loading is expressed in kg/year.

Confirm receiving WwTW and discharge level	Value	Unit
Select the WwTW the development will connect to	Blisland	
	Current discharge	
Phosphorus WwTW discharge level	5.00	mg/l

Note: Please use the drop down lists to select the WwTW that the proposed development will be connected to. If the WwTW is not known, then please select 'Unknown' from the drop down list.

3b. TP budget for Onsite treatment plants

Note: If the sewage is to be treated by on-site treatment plants then the user should select "Yes" in the list above. If wastewater treatment works are to be used instead, then the user should select "No" above.

On-site treatment plants are pre-manufactured treatment facilities used to treat wastewater in smaller communities or on individual properties. This concept is defined as decentralized wastewater treatment. The nutrient influent is calculated by multiplying the number of people by the expected loading per person. The nutrient effluent is calculated by applying the reduction efficiency. The nutrient loading is expressed in kg/year.

Calculate nutrient load after treatment	Value	Unit
Select the type of On-site treatment works	Septic tank	
Phosphorus discharge level	Please enter effluent 11.00	mg/l

Note: The user must input the reduction efficiency of the PTP. The efficiency of the PTP used must be evidenced. The evidence should include the test result documents from the lab (in English) and/ or measured effluent concentrations from real world applications. If the efficiency is unknown then a precautionary default value can be used

Calculate the nutrient load discharged by the WwTW	Value	Unit
	Current discharge	
TP discharged by WwTW	0.00	kg/year

Calculate loading from wastewater with Onsite treatment plants	Value	Unit
TP discharged by on-site treatment plant	0.85	Kg/year

4. Additional population load	Value	Unit
	Current	
TP load from additional population	**0.85**	**Kg/year**

Stage 2 **Calculate existing (pre-development) TP from current land use of the development**

Note: Where development sites include existing areas that are to be retained, these areas can be excluded from the calculations in both Stages 2 and 3.

1. Identify current land uses of the development site

Select the soil drainage type: Freely draining

Note: Use the criteria table in the Help tab to identify if the soil type

2. Select the existing land use type(s)

	Value	Unit	TP loading	
High density urban		Hectares	0.00	Kg/yr
Medium density urban		Hectares	0.00	Kg/yr
Low density urban	0.029	Hectares	0.01	Kg/yr
Commercial / Industrial		Hectares	0.00	Kg/yr
Urban open space		Hectares	0.00	Kg/yr
Dairy		Hectares	0.00	Kg/yr
Lowland grazing		Hectares	0.00	Kg/yr
Mixed		Hectares	0.00	Kg/yr
Poultry		Hectares	0.00	Kg/yr
Pigs		Hectares	0.00	Kg/yr
Horticulture		Hectares	0.00	Kg/yr
Cereals		Hectares	0.00	Kg/yr
General Arable		Hectares	0.00	Kg/yr
LFA		Hectares	0.00	Kg/yr
Allotments and city farms		Hectares	0.00	Kg/yr
Woodland (e.g. conifer, mixed, broad-leaved)		Hectares	0.00	Kg/yr
Greenspace		Hectares	0.00	Kg/yr

shrub / heathland / bracken / bog		Hectares	0.00	Kg/yr
Water		Hectares	0.00	Kg/yr
Sum total	**0.029**	**Hectares**	**0.01**	**Kg/yr**

3. Calculate loading from current land usage

	Value	Unit
TP load from proposed land usage	**0.01**	**Kg/yr**

Stage 3 **Calculate TP for the proposed development**

Note: This section should include all land uses within the proposed development. Where the proposed scheme is to create new wetlands, woodlands, nature reserves, etc. within the development site area, then this should be included within this section. Any offsite mitigation should not be included below, and should instead be inputted in the mitigation tabs *(if mitigation is required).*

2. Identify proposed land uses of the development site	Value	Unit
High intensity urban land		Hectares
Medium intensity urban land		Hectares
Low intensity urban land	0.029	Hectares
Commercial / industrial urban land		Hectares
Open Space urban land		Hectares
Allotments and city farms		Hectares
Woodland (e.g. conifer, mixed, broad-leaved)		Hectares
Greenspace		Hectares
shrub / heathland / bracken / bog		Hectares
Water		Hectares

3. Designed Wetlands / SuDS		
Wetland / SuDS area		Hectares
TP Banking coefficient		Kg/ha/year

Note: Please input the banking coefficient (i.e. wetland removal rate in kg/ha/yr) calculated for the designed wetland / SuDS. The calculated value should be justifiable with supporting evidence.

Sum total of land uses	**0.029**	**Hectares**

Note: The sum total of land uses must equal the development site area inputted in Stage 2 - the box will colour red if the areas do not match. Wetland refers to specific wetland off a watercourse - for more information refer to the land use definitions in the help tab.

4.	Calculate loading from proposed land usage	Value	Unit
	TP load from proposed land usage	**0.01**	**Kg/year**

Stage 4 **Calculate the net change in nutrient load from the proposed development**

Note: This stage calculates the net change in TP load to the catchment from the proposed development. This is derived by calculating the difference between the load calculated for the proposed development (wastewater, urban area, open space etc.) and that for the existing land uses. The nutrient budget for the site has been calculated under current and post 2025 WwTW permit levels where applicable

		Current		Summary	
				No. of dwellings	1
1.	Identify the load from additional population	Value	Unit	Onsite treatment plant	Septic tank
				Current discharge concentration	11
	TP Loading from additional population	**0.85**	**Kg/year**		
2.	Calculate net change in nutrient load from land use change	Value	Unit	TP current land use	0.01
	TP load from land use change	**0.00**	**Kg/year**	TP proposed land use	0.01
3.	Calculate nutrient budget for the development site	Value	Unit		
	TP budget for the site	**0.85**	**Kg/year**		
4.	Calculate precautionary buffer	Value	Unit		
	Buffer amount	20	%		
	TP Precautionary buffer	**0.17**	**Kg/year**		

Note: The figures used throughout this model are based on scientific research, evidence and modelled catchments and represent the best available evidence. However, it is important that a precautionary buffer is used that recognises the uncertainty with these figures and ensures, with reasonable certainty, that there will be no adverse effect on site integrity. As such, a 20% precautionary buffer is added to the budget calculations.

5.	**Total nutrient budget for the development site**	Value	Unit
	Total Phosphorus budget for the site	**1.02**	**Kg/year**

Current WwTW Permit levels

Development will generate additional Phosphorus (Mitigation required) - Please progress toMitigation - currenttab

APPENDIX 3

Percentage to Concentration Conversion

Concentration Workings

These are to convert % efficicny inputs in to mg/l so as to comply with NE request.

Exisiting

Stage 1

We have back clalcuated the concentration of P, used in Stage 1 of the Phospahte Calcualtor
In order to derive a concentration of 11 mg/l a 55% efficient must be used for septic tank.

Septic Tank Efficiecny	55	%	<copied from stage 1 calcualtion
Current Stage 1 Load	1.07	kg/year	<copied from stage 1 calcualtion
Water Use (Person)	110	Litres	
Dwelling People	2.4	People	
Year Days	365	Days	
Water Use Year	96360	Litres / Year	
Concentration	1.1104E-05	kg/litre	
Concentration	11.1042	mg/litre	