

## Guidance Note

### Package Treatment Plants and Septic Tanks as part of nutrients mitigation

August 2023

#### 1.0 INTRODUCTION

- 1.1 This guidance note has been developed by Dorset Council in consultation with Natural England, the Environment Agency, and Wessex Water.
- 1.2 The purpose of the note is to provide applicants with information that can:
- Support applicants considering their options regarding Package Treatment Plants (PTP), where that may be a viable option for achieving 'nutrient neutrality'<sup>1</sup> for development proposals within Dorset that are hydrologically linked to any one of the following habitats sites:
    - Poole Harbour SPA/Ramsar
    - Chesil & The Fleet SAC/SPA
    - Somerset Levels and Moors Ramsar
    - River Avon SAC
    - River Axe SAC
  - Support applicants in submitting information needed to enable the council to determine a planning application involving a PTP.

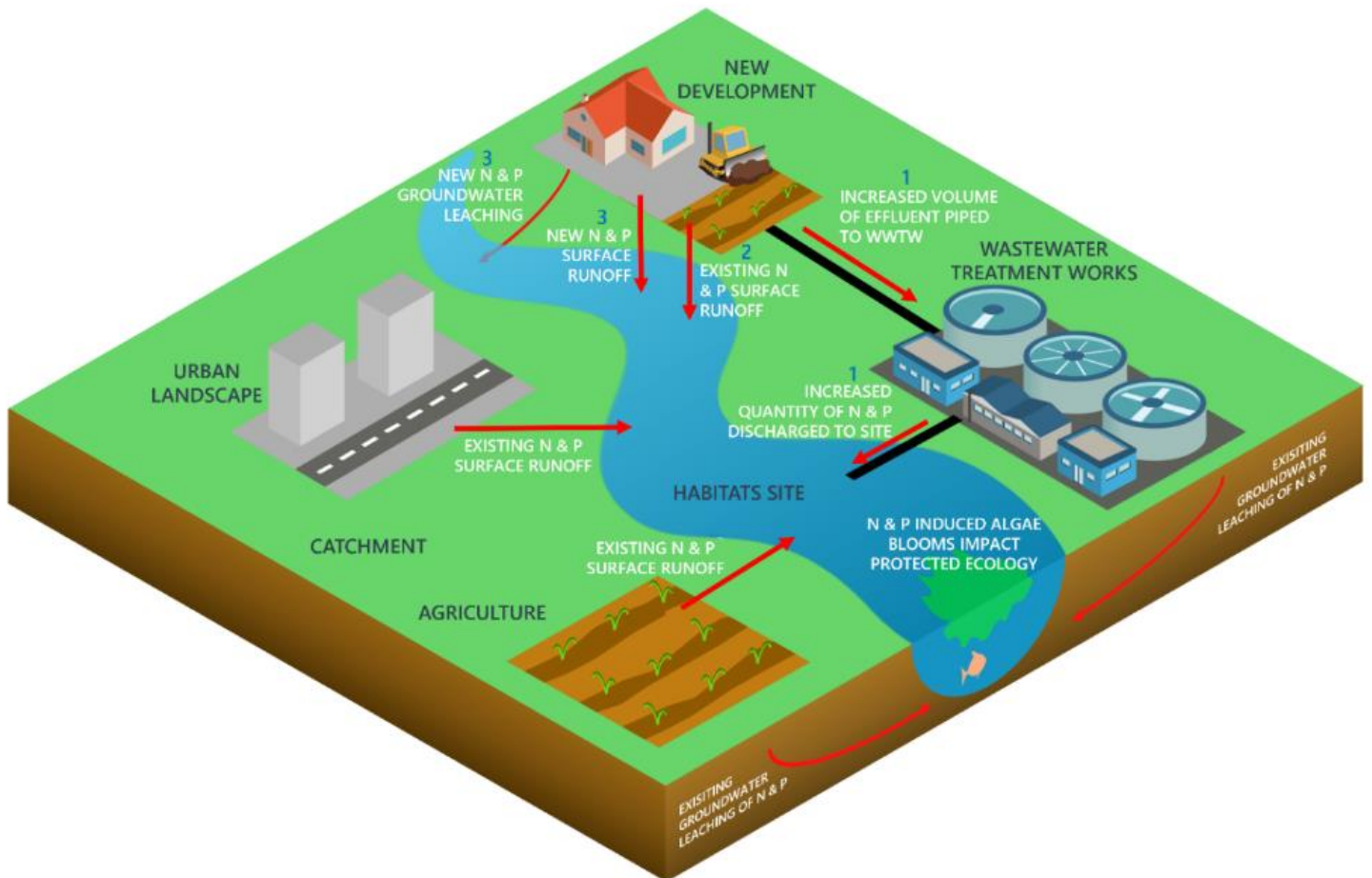
***It is important to remember that new development must connect to a public foul sewer rather than use a PTP where it is reasonable to do so.***

- 1.3 This note covers potential nutrient mitigation options that relate to private foul drainage systems, in particular:
- i. General principles for the use of PTPs and provision of new wastewater treatment plants. (Section 2.0)
  - ii. Provision of new wastewater treatment facilities managed by an OFWAT appointed statutory sewage undertaker. (Section 3.0)
  - iii. Replacing existing private foul drainage with a connection to a public foul sewer. (Section 4.0)
  - iv. Replacing existing inefficient septic tanks and PTPs with improved PTPs. (Section 5.0)
  - v. The use of a new PTP to serve a development where connection to the public sewer is not feasible (Section 6.0)

<sup>1</sup> <https://www.dorsetcouncil.gov.uk/planning-buildings-land/planning-policy/nutrient-neutrality-1>

- 1.4 The use of a PTP can help to address the nutrient discharge from wastewater. However, there may also be a nutrient discharge from surface water runoff and other sources which will need to be addressed to achieve nutrient neutral development (see Figure 1).

Figure 1: Sources of nutrient loading within a catchment.



A **septic tank** is an underground tank where the solids sink to the bottom forming a sludge and the wastewater flows out to a drainage field.

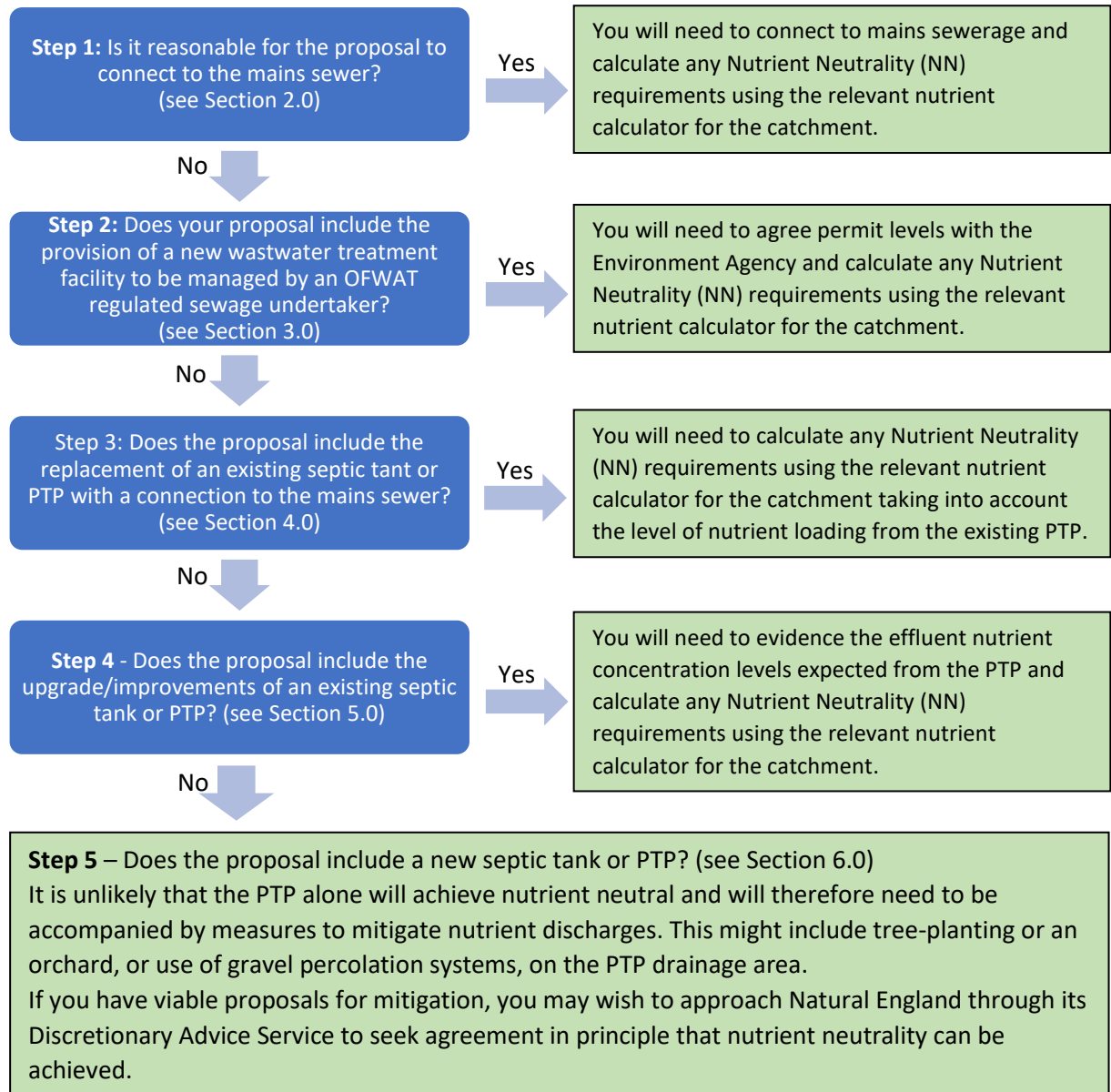
A small sewage treatment plant also known as a **package treatment plant** works in a similar way to a septic tank but uses mechanical parts to treat the wastewater to a higher standard before it goes to a drainage field.

A **drainage field** also known as an infiltration system is a series of pipes with holes placed in trenches and arranged so that the wastewater can trickle through the ground for further treatment.

- 1.5 The note focuses on the provision of non-mains wastewater treatment and provides guidance on specific solutions that may be appropriate in some cases, but applicants are

advised to consider all mitigation options available to them. The flow chart in Figure 2 aims to support applicants and decision-makers in applying advice contained in this note.

Figure 2: Flow chart for proposals that include package treatment plants and septic tanks.



(Note: Form FDA1<sup>2</sup> should be submitted to enable the wastewater arrangement proposals to be considered appropriately)

<sup>2</sup> <https://www.gov.uk/government/publications/foul-drainage-assessment-form-fda1>

## 2.0 GENERAL PRINCIPLES – PTP AND NEW WASTEWATER TREATMENT PLANTS

### National policy and guidance on use of PTPs and Septic Tanks

- 2.1 Planning Practice Guidance (Paragraph: 020 Reference ID: 34-020-20140306) includes the presumption that a connection will be made from a development to a public sewer unless it can be demonstrated that it is not feasible to do so.
- "Where a connection to a public sewage treatment plant is not feasible (in terms of cost and/or practicality) a package sewage treatment plant can be considered."*
- 2.2 The Environment Agency require discharge of wastewater from a development to the public foul sewer whenever it's reasonable to do so. They will not normally grant a permit for a private sewage treatment system if it's reasonable for a connection to the public sewer to be made taking into account the costs, any physical barriers, other environmental benefits and the proximity of the development site to the public sewer. A general rule of thumb is that if a development is within 30m of a public sewer, a connection should be made. <https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits>

Information about the water company operating in an area can be found from **Water UK** <https://www.water.org.uk/advice-for-customers/find-your-supplier/>

- **Wessex Water** provide a free pre-development advice service and a service where plans showing the location of water mains and sewers can be requested: <https://developerservices.wessexwater.co.uk/planning-and-capacity>
- **South West Water** provide a pre-development advice service which provides information about the cost of connecting to the public sewer: <https://www.southwestwater.co.uk/developer-services/sewer-services-and-connections/>

- 2.3 The use of small scale PTPs for new residential development is therefore normally only accepted by the Environment Agency where there is no option for using the mains sewerage, or where the new facility will be managed by an OFWAT-appointed statutory sewerage undertaker. Building Regulations set out design and construction standards for septic tanks, package treatment plants and the associated drainage field. For all new and/or replacement drainage systems such as PTPs, septic tanks or new drainage connections, a Building Regulation application is required to be submitted to Building Control for approval and inspection on site<sup>3</sup>.

<sup>3</sup> Further details are available at: <https://www.dorsetcouncil.gov.uk/planning-buildings-land/building-control>

- 2.4 Applicants will need to satisfy the Council, as the competent authority undertaking an Appropriate Assessment, that it is not reasonable to connect to a public sewer. All planning applications will need to be accompanied by form FDA1 to enable them to be validated.
- 2.5 The use of a PTP may not in itself achieve nutrient neutrality due to other pathways by which nutrient loading from a development can reach the designated habitats site. A PTP can only be considered nutrient neutral for waste water if:
- it is upgrading an existing inefficient septic tank or PTP; or
  - it meets agreed thresholds for small-scale discharges of phosphorus to ground<sup>4</sup>
- 2.6 Alternatively, if a PTP is implemented in conjunction with other mitigation measures, nutrient neutrality could be achieved.
- 2.7 In all cases, a nutrient budget calculation will be necessary to demonstrate that the proposed measures for managing nutrient flows from a development site, will be nutrient neutral.

### Local guidance on small-scale phosphorus thresholds

- 2.8 The discharge from a PTPs to ground in areas hydrologically connected to one of the designated habitats sites in Dorset which meet the necessary criteria, may benefit from the thresholds for small scale discharges of phosphorus to ground. This would mean that the phosphorus element of the wastewater discharge, can be screened out at the Appropriate Assessment stage of the Habitats Regulations Assessment. However, there may be other pathways by which additional nutrient loading may reach the designated habitats site and therefore further consideration may be necessary even if the small-scale thresholds for the phosphorus element of the wastewater discharges are met. In catchments sensitive to nitrogen, the nitrogen element of the wastewater discharge will still need to be mitigated.
- 2.9 The parameters that influence the decision about the potential for a significant effect on the habitats site include the proximity of the discharge point to the designated habitats site, the pathway for phosphorus to enter the designated habitats site, the hydrological characteristics of the area between the designated habitats site and the point of discharge, and the underlying geology of the area.
- 2.10 Detail of the small-scale thresholds for phosphorus discharge to ground that Dorset Council have agreed, are included in Annex 1 of this note.

### PTP types and maintenance

- 2.11 Some modern replacement PTPs use chemical dosing to achieve further nutrient reduction. However, chemical dosing PTPs should only be used as a last resort. Where a chemical dosing PTP is proposed, Dorset Council will require strong justification as to why this solution is necessary and clear reasoned evidence as to why a non-chemical dosing PTP (a biological PTP) cannot be used.

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<sup>4</sup> However in catchments sensitive to nitrogen loading, the nitrogen load from a development will still need to be mitigated.

- 2.12 There is evidence that suggests biological / non-chemical systems are narrowing the gap in terms of performance when compared against chemical dosing systems. Applicants are therefore advised to carefully consider whether a PTP using chemical dosing is:
- a. necessary to achieve nutrient neutrality for the proposal; and
  - b. an appropriate option given the need to ensure long term maintenance and monitoring of effectiveness in delivering nutrient neutrality.
- 2.13 The approach taken by regulatory bodies is precautionary at this stage and reflects two key issues:
- 1) *Chemicals used:*  
Where chemical dosing is a viable option and a means of securing long term maintenance has been agreed with Dorset Council, systems using ferric rather than aluminium salts must be used. Some forms of aluminium can be highly toxic, particularly to some freshwater species. Natural England's advice is that the use of aluminium should be avoided, particularly within the catchment of a designated habitats site, as it is not currently possible with any certainty to determine what levels would avoid adverse environmental impacts, making it difficult to conclude through an Appropriate Assessment that there would be no harm to the designated habitat site.
  - 2) *Securing maintenance and monitoring, in perpetuity:*  
When authorising a development that has been subject to an Appropriate Assessment under the Habitats Directive, Dorset Council as the Competent Authority must be satisfied that mitigation measures will be effective and deliverable for the lifetime of the development. Chemical dosing brings into focus potential risks to the environment and to the efficacy of the PTP that could arise through inadequate maintenance and monitoring of the dosing, or inappropriate storage of chemicals on-site.  
Ongoing maintenance and monitoring requires specialist support to ensure that the amount and frequency of dosing is properly managed. It may be necessary for an applicant to put in place a service agreement with an approved or specialist management company, and for Dorset Council to secure it, along with validation and enforcement arrangements, through a S106 or Unilateral Undertaking (UU). However, experience in securing these arrangements is currently limited and costs may prove to be prohibitive.  
Risks may be lessened where there is deemed to be greater long-term security as to long term maintenance and liabilities, for example, due to the scale or nature of the development project.
- 2.14 When considering planning controls, Dorset Council wish to avoid duplication with EA permit requirements where 'General Binding Rules' apply. General binding rules cannot be met if the new discharge will be in an ancient woodland or in or within 50 metres of any:
- Special areas of conservation
  - Special protection areas
  - Ramsar wetland sites

- Biological sites of special scientific interest (SSSI).

2.15 In such cases and where risks are generally lower (e.g. non-chemical dosing systems) it is more likely that a planning condition rather than a legal agreement will provide sufficient certainty, but the final decision on this rests with Dorset Council.

### Lifetime of PTPs

2.16 At the end of its operational life, a PTP will need to be replaced. The operational life of a PTP is likely to be shorter than the lifetime of the development itself and therefore a mechanism to secure a replacement will be necessary. Replacement of a PTP should bring an improvement in performance but must be at least like for like. Again, whether the need for a future information requirement to be met or application to be submitted can be covered by a condition or needs a legal agreement is a matter for Dorset Council.

### EA permit requirements

- 2.17 New Wastewater Treatment Plants, PTP and septic tank schemes will need to meet the EA permit requirements. Further information is available at:  
<https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits>
- 2.18 In certain circumstances, a permit from the Environment Agency is not required. This is when the General Binding Rules for a development are met but it is essential that this process is followed prior to a planning application being submitted to Dorset Council with a proposal for a PTP. Where the General Binding Rules are not met, a permit will be required from the Environment Agency.
- 2.19 To enable a decision to be made on a planning application where an Environment Agency permit is necessary, Dorset Council expect to see evidence that the necessary permits have been secured. This will help to avoid delays in decision making processes and enable Dorset Council to be satisfied that foul drainage can be provided without adverse impact on the environment.

## 3.0 PROVISION OF NEW WASTEWATER TREATMENT FACILITIES MANAGED BY AN OFWAT-APPOINTED STATUTORY SEWAGE UNDERTAKER

3.1 In both sewered and unsewered areas, developments may be able to provide their own wastewater treatment facilities that operate at higher efficiency than the public wastewater treatment works (WWTW), provided that the facility is adopted and managed by an OFWAT-appointed statutory sewerage undertaker. There is a requirement for a sewerage undertaker to adopt a treatment plant if a request is made to them to do so. There are however, standards that need to be met before adoption can take place<sup>5</sup>.

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<sup>5</sup> <https://developerservices.wessexwater.co.uk/wastewater/sewer-adoptions>

- 3.2 The permit limit for such facilities will need to be agreed with the Environment Agency. The nutrient load that would need to be mitigated should then be calculated using the relevant nutrient permit level from the new WWTW.

#### **4.0 REPLACING EXISTING PACKAGE TREATMENT PLANT OR SEPTIC TANKS WITH A NEW CONNECTION TO A PUBLIC FOUL SEWER**

- 4.1 First time sewerage schemes that replace existing PTPs / septic tanks can reduce nutrient loads to the environment and thereby generate nutrient credits for new development. In a similar way, existing developments connected to a PTP / septic tank could be connected to the public sewer. For credits to be generated, the nutrient loading from the existing PTP / septic tank will need to be understood. This loading will need to be compared with the nutrient loading expected from the sewerage scheme that will serve the development in accordance with the levels permitted by the Environment Agency. The permitted level of nutrient discharge will need to be used and follow the approach within the relevant nutrient calculator for the catchment.
- 4.2 The nutrient budget for such schemes should be calculated using the methodology set out above for the existing PTPs / septic tanks to be replaced by the sewer connection and the standard phosphorus budget calculator for the additional load that would require treatment by the new WWTW.

#### **Proposals for connecting PTPs to a public foul sewer**

- 4.3 Proposals for discharging PTPs to the public sewer have been put forward as a means of achieving nutrient neutrality. Although the use of a PTP would mean cleaner water would reach the WWTW, there will still be an increase in flow, therefore this does not necessarily mean that it would reduce the nutrient load discharged from the WWTW which would be discharging up to its permitted nutrient level. Whether there would be a reduction and the scale of any reduction is extremely hard to determine with certainty due to the complexity of factors which could influence this which would be case specific and could vary over time.
- 4.4 Due to the uncertainties in demonstrating that nutrient neutrality will be achieved in perpetuity, Natural England and Dorset Council do not accept this approach within Appropriate Assessments.

#### **5.0 REPLACING EXISTING INEFFICIENT SEPTIC TANKS AND PACKAGE TREATMENT PLANTS**

- 5.1 Nutrient credits may be generated by upgrading existing PTP and septic tank units. For example, an applicant proposing new houses might be able to replace septic tanks at existing neighbouring properties, or elsewhere provided the replaced units are appropriately located and it would not be reasonable to connect to the public sewer (see general principles in section 2.0). Failing systems will not be able to claim nutrient credits



beyond the default baseline for expected performance i.e., poorly performing systems will not be rewarded.

- 5.2 PTPs or septic tanks that discharge to ground should only be replaced by units that also discharge to ground, where ground conditions are appropriate for drainage. Existing units that currently discharge to water may be replaced by units that discharge to either directly to water, or to ground. There is a legal requirement to replace septic tanks that discharge to water with an appropriate PTP and therefore this default legal position will need to be taken into account when proposing to replace a septic tank with a PTP to achieve a nutrient benefit.
- 5.3 Replacement of existing units that discharge to ground in areas hydrologically connected to one of the catchments of concern, which meet the thresholds for small scale phosphorus discharge (and are therefore screened out from the Appropriate Assessment process) may not be used to generate phosphorus credits. Further information on the small-scale thresholds for phosphorus discharges to ground can be found in Annex 1.
- 5.4 All PTP and septic tank replacement schemes will need to meet the Environment Agency permit requirements. The vast majority of these discharges will be operating under the General Binding Rules, but some may need an Environmental Permit from the Environment Agency. Further information is available at: <https://www.gov.uk/permits-you-need-for-septic-tanks/you-have-a-septic-tank-or-small-sewage-treatment-plant>
- 5.5 All septic tanks and PTPs undergo independent third-party testing to ensure that they meet British Standards (BS EN 12566), and the associated certification sets out the mean concentration of the effluent from the system. Not all will have been tested for Total Nitrogen (TN) or Total Phosphorus (TP) as this is not a mandatory requirement of the British Standard, but where the certificate (or test results from the independent test if it was undertaken but not included on the certificate) can be provided, this is sufficient evidence of the TN and TP concentrations that the effluent will achieve. In these circumstances there is no need for any further monitoring evidence.
- 5.6 Where there is no relevant TP/TN effluent concentration on a valid test certificate or test results from a third-party test facility to British Standards, or the type of system is not known then the load of the septic tank / PTP should be calculated using the default mean concentration values:

***Phosphorus***

***Septic tank = 11.6 mg/l***

***PTP = 9.7 mg/l***

***Nitrogen***

***Septic tank = 96.3 mg/l***

***PTP = 72.9 mg/l***

- 5.7 Monitoring of the nutrient levels in the effluent from the PTP / septic tank to be replaced provides an alternative approach however, to be accepted such monitoring should cover at least 8 months of typical operation.
- 5.8 Due to the legal requirement to replace a septic tank that discharges to water with an appropriate PTP, the default nutrient discharge position in this circumstance is the discharge expected from a PTP rather than the septic tank. This will be the starting point for any nutrient budget calculations involving the upgrade of a septic tank that discharges to water.
- 5.9 The total nutrient loads expected from the existing facility can then be calculated using the standard calculators using the average water per person water consumption for the existing properties. This may be derived from reasonable meter readings where available or based on the average water consumption for the property type.
- 5.10 A legal agreement is likely to be required through the planning consent process to ensure that the mitigation is secured in perpetuity and linked to the proposed new development.

## **6.0 PROPOSALS FOR NEW PACKAGE TREATMENT PLANTS**

- 6.1 Before a new PTP can be accepted as a means of managing wastewater from a new development, the proposal will need to establish that it is not feasible for alternative arrangements to be put in place. Form FDA1 will be the primary route for making this assessment and therefore should form part of a pre-application discussion or be submitted as part of the application process.
- 6.2 Where a new PTP is justified and proposed as part of a development, the Environment Agency's general binding rules will need to be applied to establish whether an Environment Agency permit is required. If a permit is required, this will need to be secured prior to a planning application being submitted.
- 6.3 Where a permit is not required, because the general binding rules are met, details of the wastewater treatment approach will need to be submitted as part of the planning application which detail how any residual nutrient loading will be addressed. These details will need to be secured either through the use of a condition or through a legal agreement.
- 6.4 It is advisable that if a new PTP is proposed, the applicant makes use of Natural England's discretionary advice service to establish what nutrient loading mitigation options are suitable.

## ANNEX A: THRESHOLDS FOR SMALLSCALE DISCHARGES OF PHOSPHORUS TO GROUND

- A.1. For small scale thresholds for discharges of phosphorus to ground to apply, there needs to be certainty based on objective evidence that there will not be a likely significant effect on the designated habitats site. Where evidence does not exist, or there is some doubt, the precautionary principle applies, and it should be assumed that a likely significant effect exists. This would require an appropriate assessment to be undertaken to consider the proposal in detail along with any proposed mitigation.
- A.2. Due to the variation between different sites, it is difficult to make generalisation about the application of small-scale thresholds across a catchment. It is also important that the characteristics of the habitat site that may be affected by the discharge and the cumulative impacts of multiple small-scale discharges are considered.
- A.3. The default position remains that connection to a mains sewer is required unless it is not feasible for the connection to be made. Connection to a mains sewer allows for the regulation of nutrient flows, the evaluation and mitigation of any residual nutrient flow and for in-combination effects to be considered as part of the regulation of the mains sewer system.
- A.4. Where a PTP is justified within the catchment of a designated habitats site, small scale discharge of phosphorus to ground may be capable of being discounted from having a significant impact on the designated habitat site if all the following criteria are met. Evidence of this will need to be provided as part of a planning application accompanying the proposal.
- A.5. It is not however appropriate to consider a similar approach to nitrogen discharge as nitrogen does not get taken up by the soil in the same way as phosphorus.
- A.6. Correctly located, designed, installed and managed PTPs that including an appropriately designed drainage field, should minimise phosphorus flow to a level that can be considered insignificant. The amount of phosphorus removed from the PTP discharge depends on the phosphorus characteristics and the following characteristics of the drainage field:
- soil type
  - mineral content
  - Ph
  - texture
  - the hydraulic loading rate
- A.7. In addition, if the drainage field connects to an existing water body (for example a drainage ditch, watercourse, water table, area at risk of flooding, or steep slope) that accelerates the flow from the PTP, harm can be caused to the habitats site.

- A.8. In all instances, the Building Regulations requirements will need to be met including a percolation test to make sure the drainage field effectively removes pollutants.
- A.9. Small discharges of less than 2m<sup>3</sup> per day are therefore unlikely to cause a significant effect on the habitats site if all the following conditions are met.
- Condition 1: The drainage field is more than 50m from designated site boundary.
  - Condition 2: The drainage field is more than 40m from surface water feature.
  - Condition 3: The slope of the ground is less than 15% (1 in 7)
  - Condition 4: Ground water is more than 2m below surface at all times of the year.
  - Condition 5: The entire drainage field is in flood zone 1.
  - Condition 6: There are no other factors that would increase the rate of transfer to the habitats site such as geology or underground pipework.
  - Condition 7: The drainage field should be at least 200m from any other drainage field or discharge points.
- A.10. The onus will be on the developer to collect sufficient robust information to demonstrate that all these conditions have been met.
- A.11. Where best available evidence indicates that all these conditions are met, the conclusion is that no likely significant effect can be reached. However, where a degree of uncertainty remains this conclusion cannot be reached and therefore an Appropriate Assessment will be necessary to explore the proposal in more detail.