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**Regulatory Method (WAT-RM-04)**

**Indirect Sewage Discharges to Groundwater**

**Version: 8.0**

**Released: April 2022**

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**Update Summary**

|  |  |
| --- | --- |
| Ver. | Description |

|  |  |
| --- | --- |
| v1.0 | Draft version |
| v1.1 | First issue for Water Use reference using approved content from the following documents: Indirect\_to\_GW\_final\_version.doc |
| v2.0 | Section 3.1 revised to reflect threshold increase (15 to 50 pe) Section 5.5.7 now includes info on how to size soakaways Section 7 added (Regulating willow treatment systems) BR478: (Mound Filter Systems) added as reference doc and WAT-RM-22 links now refer to WAT-RM-34. / Various minor edits |
| v3.0 | Sections 3.4 & 5.5.7 text details revised; New base template applied, links to docs revised for new SEPA website, Nov 2008 |
| v4.0 | Section 7 new procedure for regulating willow treatment systems, Figs 1 & 2 minor modifications. (Jan 2011) |
| v5 | Expired CMS links reviewed and updated. |
| V6 | Change to mean effluent standards - new section 3.8 and changes to sections 5.5.6 and 5.6.1 |
| v7 | Strengthening of wording that SEPA are minded not to authorise discharges where connection to public sewer is possible. |
| v7.1 | s5.5.7 non-domestic pe now specifies 'standard residential flow', intranet link updated |
| v7.2 | Added: s3.9/3.10 compost toilets/grey water; s5.5.7 non-domestic septic tank p.e loading |
| v7.3 | s3.1 updated to define ‘existing’ and clarify paper application process. |

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| --- | --- |
| Ver. | Description |

|  |  |
| --- | --- |
| V8.0 | * S1 Key Points. Addition of text - *Direct discharges to groundwater (e.g. to a borehole, mineshaft) are prohibited…* * S3 Pre-app text inserted. *A sewage discharge onto the surface of land will not be permitted, unless it is urine used as a fertiliser from a household*. * S3.1 is now consistent with the online registration system, CAR Practical Guide (and RM-03) which refers to 9 properties not homes. 3 domestic properties / 15 p.e. is referenced for new sewage discharges – Domestic excludes hotels, cafes etc. For existing sewage – registration for up to 9 domestic properties (or up to and including 50p.e. if a non-domestic property) * S3.2.1 updated to reflect agreed position on modifying registrations * S3.3 Connection to public sewer – wording amended * S3.4 Discharge to land - wording amended * S3.6 Statement that SEPA’s preference is for a single treatment system on a single site rather than multiple registrations * S3.7 Removal of requirement for Building Warrant number * S3.9 EN12566 Part 3 amended to be consistent with RM-03 * S3.10 Amendment to composting toilet section to rename from UDDTs. * S3.12 added Hot tub link to SG-41 (now updated for hot tubs). * S3.13 to 3.15 moved from s5.7 (Other considerations) to this Pre app section * S4.2.2 Reference to new Registry screening procedure for registrations including risk to potable supplies. In Vp <15 section, clarification that secondary treatment required and addition of reference to unpowered bell siphon dosing system. In Vp 100-140 section, addition of a filtration system to match Technical Handbook. * S5.2 Referring to exceptional circumstances when another party other than individual or body corporate can be named as authorised person. * S5.3 Mound soakaways are not recommended for licence level discharges * S5.4.2 Changed to *visual or audible alarm system to notify of plant breakdown or power failure may be a licence requirement for larger discharges*. * S7 Minor wording changes to Willow treatment systems section. |

# 1 Key Points

This guidance concerns indirect sewage discharges to groundwater. Direct discharges to groundwater (e.g. to a borehole, mineshaft) are prohibited under the Water Environment (River Basin Management Planning: Further Provision) (Scotland) Regulations 2013.

For sewage discharges to surface waters please refer to [WAT-RM-03: Regulation of Sewage Discharges to Surface Waters](https://www.sepa.org.uk/regulations/water/pollution-control/pollution-control-guidance/) for guidance.

The guidance is designed for use with the following permit templates available from the [Approved Templates folder](file:///C:\Users\andrew.hemingway\OneDrive%20-%20Scottish%20Environment%20Protection%20Agency\Documents%20-%20Permitting%20Cells\Approved%20Templates%20and%20Docs\Templates%20-%20Permits\CAR-PS):

* [CAR-R – New Sewage Template](https://scottishepa.sharepoint.com/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Permits/CAR-PS/CAR-R%20-%20New%20Sewage%20Template.docx?web=1)
* [CAR-R – Existing Septic Tank Template](https://scottishepa.sharepoint.com/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Permits/CAR-PS/CAR-R%20-%20Existing%20Septic%20Tanks%20Template.docx?web=1)
* [CAR](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-TEMP-04) Sewage 16-100 PE template
* [CAR](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-TEMP-04) Sewage 101-200 PE template

* [CAR](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-TEMP-04) Sewage 201-1999 PE template
* [CAR](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-TEMP-04) Sewage ≥2000 PE template (new template not currently available)

# 2 Process Flow

**Figure 1 Decision Tree for Sewage Discharge Application**

Yes

Licence

*Section 6.1*

No

No

No

Is the discharge from ≤ 3 domestic properties / 15p.e. non domestic?

Is the discharge from > 3 domestic properties / >15p.e. non domestic?

Is the discharge from

> 50p.e.?

Register if ≤ 9 domestic properties/50 p.e. (Registry)

Licence if >9 domestic properties/50 p.e.

*Section 3.1*

Yes

Yes

No

Yess

Yes

Licence

*Section 5.1*

Registration

*Section 4.1*

Connect to public sewer

*Section 3.3*

Is it an existing sewage discharge?

Is it feasible to connect to public sewer?

# 3 Pre-Application Consultations

The flowchart in [Figure 1](#fig_1) details the initial steps which should be followed when receiving a query regarding a proposed sewage discharge.

A discharge to soakaway (this term is used in this document for an infiltration system) is SEPA’s preferred method for the disposal of treated sewage effluent where the ground conditions allow adequate infiltration of the effluent and sufficient attenuation of the polluting nature of the discharge.

A sewage discharge onto the surface of land will not be permitted, unless it is urine used as a fertiliser from a household.

Refer to [Other Considerations](#_Other_Considerations) for guidance on:

* Multi-ownership discharges
* Separating surface water from treatment plants

All references to the Technical Handbook refer to the [Technical Handbook](https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/): (Domestic Buildings Section 3: Environment).

## 3.1 Existing Unauthorised Discharges

All existing unauthorised discharges must be authorised. We will grant authorisation on the basis that the existing treatment system is not causing pollution.

If the existing system is causing pollution or there is no treatment system in place (i.e. a raw discharge) then we will require improvements within a reasonable timescale (to be inserted into the Notification of Registration) depending on the local circumstances. Untreated discharges should be assessed in accordance with [WAT-PS-](http://www.sepa.org.uk/regulations/water/pollution-control/pollution-control-guidance/)08-01: Untreated Sewage Discharges.

For existing discharges (i.e. discharges from properties that have been in use for >2 years) serving up to 9 domestic properties (or up to and including 50p.e. if a non-domestic property) (population equivalent, see section 3.5), applicants can apply to register their discharge. If the discharge is treated (e.g. septic tank or package treatment plant) they can use SEPA's [online application system](https://www.sepa.org.uk/regulations/authorisations-and-permits/application-forms/private-sewage-treatment-system). If the discharge is untreated, applicants can apply using SEPA’s [Registration - Existing Sewage Discharge Form](https://www.sepa.org.uk/media/219137/wat-app-reg-01.pdf). This application form can also be used for treated discharges. Discharges serving more than 9 domestic properties but less than 50p.e. can also be registered using this form.

The threshold of 9 domestic properties (or up to and including 50p.e. if a non-domestic property) is used for existing discharges, whereas 3 domestic properties / 15 p.e. for non-domestic developments should be used for new sewage discharges.

Where there are multiple septic tanks discharging to a single soakaway, a registration should be issued for the discharge from each property. This allows for easier enforcement of registration conditions.

## 3.2 Modifying Authorised Discharges

### 3.2.1 Modifying Registered Discharges

If the p.e of an existing registered discharge is increased but no additional properties are added to the system (e.g an additional bedroom is added) there is no need to vary the registration. If an additional property is added to the system but the total number of domestic properties does not exceed 3, then the registration requires variation to include this named property. The form [Registration - Variation to an existing CAR registration](https://www.sepa.org.uk/regulations/authorisations-and-permits/application-forms/) should be completed.

If the number of domestic properties increases beyond the registration threshold of 3 a new application for a simple licence should be made.

Some discharges between 3-9 domestic properties (or up to and including 50p.e. if a non-domestic property) are registered as ‘existing’ discharges. If the conditions in the registration cannot now be complied with, for example if an additional property is added to the treatment system or the discharge location changes from a soakaway to a watercourse, a new controlled activity is being undertaken. The discharge does not benefit from falling into the 9 domestic properties (or up to and including 50p.e. if a non-domestic property), existing category and a new application for a simple licence should be made.

For discharges ≤ 3 domestic properties, if the discharge location changes e.g. from a watercourse to a soakaway, a variation should be applied for.

* The procedure for variation of registrations as described in [WAT-RM-09: Modifications to CAR Authorisations](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-RM-09) should be followed.

NOTE: Deemed registrations should be assessed in accordance with WAT-RM-09.

### 3.2.2 Modifying Licensed Discharges

For licensed discharges, changes to the licence such as an increase in the number of properties, requires a variation of the licence. Refer to [WAT-RM-09: Modifications to CAR Authorisations](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-RM-09) for details.

## 3.3 Connection to the Public Sewer and Adoption by Scottish Water

All sewage discharges from new developments should connect to the public sewer where reasonably practical. Developers should contact Scottish Water to investigate the possibility of connection to the public sewer and seek their authorisation. Where connection to the public sewer is possible, no authorisation from SEPA is required.

We may refuse any application to discharge to the water environment where we consider it reasonably practical to connect to the public sewer on the basis that it is not the most sustainable or efficient use of the water environment. Any application to discharge to the water environment from a new development within or close to the public sewer must be accompanied with a justification of why connection to the sewer is not practicable.

Reference should be made to [WAT-PS-06-08: Policy and Supporting Guidance on Provision of Waste Water Drainage in Settlements](http://www.sepa.org.uk/regulations/water/pollution-control/pollution-control-guidance/) which sets out SEPA's policy principles on the provision of waste water drainage within and outwith settlements served by a strategic sewerage system.

## 3.4 Population Equivalent

### 3.4.1 Domestic Population Equivalent

Population equivalent for domestic housing should be determined using the number of bedrooms as referred to in the latest version of [Flows and Loads](http://www.britishwater.co.uk/Search/Default.aspx?q=flows+and+loads) (British Water Code of Practice).

For large developments (more than 10 houses) an alternative method for deriving p.e. as described in [WAT-SG-13: Municipal Sewage Treatment Works (STW)](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-SG-13) can be followed.

### 3.4.2 Non-Domestic Population Equivalent

To calculate the population equivalent for non-domestic sewage effluent, multiply the number of people using the system by the BOD load (g/day) and divide by 60 (60g is the average BOD load for one person in one day). The [Flows and Loads](http://www.britishwater.co.uk/Search/Default.aspx?q=flows+and+loads) Code of Practice can be used to determine flow and load figures for various types of non-domestic sewage discharge.

## 3.5 Shared Systems

At a single site SEPA’s preference is for a single treatment system shared by a number of properties rather than individual systems provided for each dwelling. Performance of a single plant is normally more consistent because of better balanced flows and loads and monitoring and enforcement by SEPA is simpler. In addition, a single system allows a full assessment of the overall environmental impact of a development proposal, eg by following the CAR licensing checks. Dividing a site into a number of smaller registration level applications would bypass this assessment.

Some developments are served by more than one treatment system (septic tank/package plant etc) sharing a soakaway. In this case each discharge from a property should be separately authorised by registration or licence as appropriate.

## 3.6 New Discharges - Registrations

If the discharge is from a new development, the person should be advised that the sewage disposal system should be installed in accordance with [Technical Handbook](https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/): (Section 3: Environment), which provides guidance on achieving the standards set in the Building (Scotland) Regulations 2004. Building Control Authorisation will be required for the construction of the soakaway.

The applicant should make an application which SEPA have 30 days to consider unless further information is required.

The applicant should be asked if it is possible to connect to the public sewer, and if not, advised to undertake percolation tests to determine the feasibility of discharge to land.

The applicant should be advised that septic tank treatment may be an acceptable option where the percolation value (Vp) is between 15 secs/mm and 100 secs/mm.

Where the drainage is poor and the Vp is greater than 100secs/mm but less than 140 secs/mm, then secondary treatment is required prior to discharge to soakaway system.

Where the drainage is poor and the Vp >140secs/mm, then discharge to surface waters after appropriate treatment is the preferred option (see [WAT-RM-03: Regulation of Sewage Discharges to Surface Waters](https://www.sepa.org.uk/regulations/water/pollution-control/pollution-control-guidance/)). If a discharge to surface waters is not feasible, applicants should consider other methods of disposal such as mound soakaway as detailed in the [Technical Handbook](https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/): (Section 3: Environment).

Guidance on mound soakaways can be found in [Mound filter systems for the treatment of domestic wastewater](http://www.brebookshop.com/search.jsp?userSearch=br478&userPublisher=&userProductType=) (BR478).

For discharges with Vp less than 15 secs/mm then secondary treatment is normally required (unless applicant can demonstrate that primary is acceptable) prior to discharge to an infiltration system that has been designed to ensure a greater distribution of effluent over a larger area (see [Determining Appropriate Treatment](#_Determining_Appropriate_Treatment) for further details).

## 3.7 Licensable Discharges

The applicant should be sent a Licence [Application Form](http://www.sepa.org.uk/regulations/authorisations-and-permits/application-forms/#Water) and advised that, in order for SEPA to determine the application, a Prior Investigation must be undertaken. The Prior Investigation section of the application form must be completed. This will determine the level of treatment that will be required and/or the acceptability of the proposal. See [Licence standards and requirements](#table_1) table.

The applicant should also be advised that the soakaway (if a suitable option) must be constructed in accordance with the [Technical Handbook](https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/) (which provides guidance on achieving the standards set in the Building (Scotland) Regulations 2004). Any non-standard designs will require detailed justification of the expected performance.

Soakaway construction is regulated by the local Building Control Authority whom the applicant should contact.

### 3.7.1 Discharge ≥ 50 p.e

The applicant should be advised that, in general, discharges to ground from more than 50 p.e. are not encouraged due to the risk that they pose to the water environment. Applicants should be advised that stringent treatment standards and significant investigatory and monitoring work will be required.

An intrusive site investigation and simple quantitative assessment should be carried out by a competent person on behalf of the developer. In most cases a down-gradient monitoring point, such as a borehole, should be provided by the developer so that ongoing monitoring can be carried out. (see [Monitoring the Discharge](#_Monitoring_The_Discharge)). An upgradient monitoring point may also be required to allow background water quality to be assessed. Due to the large volume of the discharge, the potential for nutrient pollution needs to be considered and some form of treatment to reduce the nitrate loading may be required. The Water Resource Unit should be contacted to discuss possible investigatory requirements for discharges of this size.

## 3.8 Package Treatment Plant Certification to EN12566 Part 3

New sewage domestic discharges from package treatment plants serving up to and including 50pe require to be treated by a plant tested and certified to EN12566 Part 3. To obtain certification to EN12566, plants must undergo rigorous independent testing which results in a documented mean discharge standard and percentage reduction in pollution across the plant.

The mean standard in the EN12566 Part 3 certificate is a clear and unambiguous assessment of the performance of the plant and is used in the CAR authorisation for unsampled sewage discharges. Note that the mean standard is a **design** standard and not an effluent standard.

Although EN12566 Part 3 certification applies only to domestic premises, ‘domestic’ in terms of EN12566 includes cafes, restaurants and commercial premises. Influents from cafes/restaurants and commercial premises can be significantly stronger than those from residential/household premises and therefore the mean effluent standards in EN12566 Part 3 may not be achievable. Bearing in mind that the mean effluent standards in EN12566 Part 3 may not be achievable for these situations (non-residential/non-household uses), it may be proportionate for the applicant to determine the mean quality that will be achievable based on a realistic influent strength for non-residential/non-household uses.

For situations where EN12566 Part 3 does not apply (i.e. domestic >50pe and non-PTP reed bed/wetlands), process design for each situation must be undertaken to determine the mean BOD and ammonia for the treatment system based on the influent strength and loadings. These figures can then be used in the licence.

The use of low energy or passive systems can be more sustainable and should be encouraged.

## 3.9 Composting Toilets

Composting toilets are sometimes an option for small scale situations remote from the public sewer, particularly where there is no water supply.

Composting toilets which divert urine from the solid fraction of the toilet waste are sometimes known as Urine Diverting Dry Toilets (UDDTs).

The urine can be discharged to soakaway with a Registration or Licence according to the population served as calculated as usual using the Flows and Loads document. A percolation test should be undertaken to determine the suitability of soil for infiltration. For registration level discharges the liquid fraction from a UDDT can be discharged via a small soakaway. The soakaway size can be small due to the much reduced volumes from a non-flushing toilet.

Alternatively for households the urine fraction can be used as a fertiliser.

Composting toilets with no urine separation (which can be problematic in the UK climate) keep the liquid fraction within the waste matter. There is no need for a discharge authorisation as there is no discharge.

Properly composted solid fractions from private households can be considered to be fertiliser and applied in accordance with GBR18. SEPA does not seek to regulate the disposal of the solid fraction (or the waste from true composting toilets) from private households provided it is not for commercial gain. Advice on the disposal of the solid fraction/waste from establishments other than private households can be obtained from SEPA National Waste Policy.

## 3.10 Grey Water

Grey water is all wastewater excluding discharges from toilets i.e. grey water should not have significant faecal contamination. Sources of grey water include sinks, baths, showers and washing machines. Grey water must not be allowed to discharge directly to the water environment but should be directed to a soakaway with an appropriate CAR authorisation. The design of the soakaway should be compliant with the [Technical Handbook](https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/): (Section 3: Environment), which specifically refers to grey water.This will require an authorisation from local authority Building Control. A filter may help prevent clogging of the soakaway.

## 3.11 Hot Tubs

Discharges of effluent from hot tubs should be directed to the foul sewer where possible and agreed with Scottish Water. Where discharge to the public sewer is not possible the feasibility of a discharge to land should be investigated. Hot tub effluent must not be discharged via private sewage treatment system. WAT-SG-41 provides further details on dealing with hot tub effluent.

## 3.12 Surface Water

Surface water from hardstanding and paved and roofed areas etc must be excluded from a STW or septic tank to avoid hydraulic overloading during rainfall and possible impacts on the treatment process and discharge quality. Where a significant input of surface water is unavoidable, the use of a Dry Weather Flow condition may be appropriate.

## 3.13 Non-Domestic Effluent

Non-domestic sewage inputs to a STW or septic tank can adversely affect performance. For instance, commercial kitchen waste from hotels and restaurants with a high fat and grease content can cause blockages. Discharges from hot tubs can disturb bacterial action in a septic tank. The provision of grease traps, separate treatment/disposal options for waste fat needs to be agreed with the discharger. Further information regarding factors affecting small STWs can be found in [Flows and Loads](http://www.britishwater.co.uk/Search/Default.aspx?q=flows+and+loads).

## 3.14 Flow Variations at Package Treatment Plants

Flow variations affecting effluent quality may occur due to:

* Seasonal factors
* Variations in influent pumping

**Seasonal Flow Variations**

Seasonal flow variations may be most marked at camping and caravan sites (where the whole site may close for the winter) and to a lesser extent at STWs serving hotels and chalets/holiday homes. These variations can be addressed by installing two or more units to operate in parallel, so that more units can be operated as the loads increase, and also by recirculating the effluent so that the medium is kept wet with a viable population of bacteria. For sites receiving no flow for part of the year, consideration should be given to reseeding the plant.

**Flow Variations Due To Pumped Influents**

Effluent quality at treatment works receiving pumped influent can be adversely affected by flow variations. Therefore flow balancing may require to be considered.

# 4 Registrations

## 4.1 Introduction

Sewage discharges to the water environment from up to 3 domestic properties or for non-domestic properties, up to and including 15p.e., are assumed to be relatively low risk. Registered discharges do not have to specify an authorised person and will not be routinely monitored.

If the new development is within the Loch Leven (Central Scotland) or Lunan Lochs catchments we will require a licence application regardless of the size of the development. In these cases, the guidance contained in section 5 should be followed. However, the registration application charge will still apply in these cases.

For new discharges SEPA needs to ensure that the treatment proposed for the discharge provides an adequate level of environmental protection for groundwater. SEPA can assess cumulative impacts of sewage discharges using a database of authorised discharges. For example, a proliferation of indirect discharges to groundwater may result in an unacceptable impact on groundwater quality. Therefore information relating to the proposed sewage discharge must be kept by SEPA.

## 4.2 Determining the Registration Application

### 4.2.1 Existing Discharges

Refer to section 3.1 Existing Unauthorised Discharges.

### 4.2.2 New Discharges

Registration applications for new discharges require additional information over and above that required for existing discharges - for example the percolation value (Vp), discharge location and the location of any springs, wells or boreholes used for potable supply that are within 50m of the discharge.

For a new discharge, [screening](file:///C:\Users\andrew.hemingway\OneDrive%20-%20Scottish%20Environment%20Protection%20Agency\Documents%20-%20Permitting%20Cells\Point%20Source\Admin%20and%20Guidance\Sewage\CAR%20Registration%20SoakawayTriage%20v2.pptx) is undertaken by Registry. If the screening fails then the application is passed to the Permitting Team for further determination. The guidance below sets out the tests that should be taken to make this further determination.

* Public Sewer Network is within 50m

If the screening failed because a proposed discharge point is within, or immediately adjacent to a sewered area, you should confirm the location of the discharge and ask the applicant to clarify why they can’t connect. SEPA will be minded to refuse the application, see section 3.3.

* Risk to potable water supplies

New sewage discharges to land can pose a risk to drinking water supplies. The screening determines if there is a well, spring or borehole used for potable water supply within 250m. If this is the case, then screening is failed and Registry pass to Permitting.

If screening indicates that the source is within 250m, the precise location and nature of the source should be confirmed by the Permitting Team discussing with the applicant. If the source is >50m from the soakaway, then the risk to the PWS can be discounted.

If the source is <50m from the soakaway, the Permitting Team should then assess if the abstraction is sourced from a spring or shallow un-pumped well that is upslope from the discharge. If so, it can be authorised. If the water supply is not upslope or is sourced from a borehole or pumped well then the presumption is that this application would not normally be authorised. The Water Resource Unit (WRU) can be contacted for advice.

* The percolation value (Vp) is between 15 and 100 secs/mm

If the applicant has submitted a Vp value between 15 and 100 secs/mm then Registry will register the application. A septic tank discharging to soakaway, designed in accordance with the details in the [Technical Handbook](https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/) should be acceptable. Permitting staff will only become involved in circumstances where the Vp value is outwith this range.

If the Vp value is:

* <15 secs/mm  
  Consider alternative disposal options including discharge to mound soakaway or alternatively discharge to surface waters. If none available then secondary treatment is required. Only in unusual circumstances will SEPA allow primary treatment and after the applicant has demonstrated that primary treatment is sufficient. In such circumstances the officer should discuss the matter with the Water Resource Unit and her/his Unit Manager. If discharge to land is the only option, the applicant should use secondary treatment and consider increasing the area of distribution of the effluent with a minimum size of area of A (m2) = 3.6 x p.e. and consider a dosing system (eg by using a bell siphon or pump) to ensure effective distribution of effluent throughout the soakaway system.
* Between 100 and 140 secs/mm  
  Consider other disposal options including appropriately treated effluent to surface waters or, for discharges to land, this should be via a reed bed to soakaway, constructed wetland or a filtration system.
* >140 secs/mm  
  Consider other disposal options including appropriately treated effluent to surface waters (normally via a partial soakaway) or, if there are no surface waters nearby the construction of a mound soakaway in accordance with the aforementioned Technical Handbook. Guidance on mound soakaways can be found in [Mound Filter Systems for the treatment of domestic wastewater](http://www.brebookshop.com/search.jsp?userSearch=br478&userPublisher=&userProductType=) (BR478).

Document [GPP 4 Treatment and disposal of sewage where no foul sewer is available](http://www.netregs.org.uk/library_of_topics/pollution_prevention_guides/waste__sewage_ppgs.aspx) provides guidance to dischargers on percolation tests, minimum tank sizes and soakaway construction.

### 4.2.3 Insufficient or Incorrect Information

Previously SEPA required a Building Control Number to be supplied with the registration. This is not now required. If the mandatory boxes have not been completed on the application form, it should be returned to the applicant and they should be informed that their application cannot be processed until all mandatory information is supplied. Alternatively, the applicant may be contacted by the SEPA officer and, if the applicant agrees, the application can be amended by the SEPA officer.

If the level of treatment set out in the application is not of a sufficient standard to meet SEPA’s requirements, for example only primary treatment being proposed in an area where the Vp < 15 secs/mm, the SEPA officer should contact the applicant and discuss the available options that would be acceptable to SEPA. If agreement cannot be reached then SEPA may refuse the application.

N.B. Before a registration is refused, consideration should be made as to whether escalation to a licence would be acceptable and provide the necessary safeguards.

Where agreement is reached between the applicant and the SEPA officer, the officer may, with the applicant’s consent, amend the application details. Alternatively the application form can be returned to the applicant for amendment.

Changes to the application details should only be made by a SEPA officer with the full consent and understanding of the applicant and should be recorded. Written consent should be obtained wherever possible.

Where the SEPA officer requests further information [Regulation 14(1)] and considers that the discussions will extend beyond the 30 days statutory determination period [Regulation 16(1)(a)] then the officer should request the information in writing as part of a request for further information (Refer to [CAR Reg 14 email](https://scottishepa.sharepoint.com/:w:/r/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Other%20Docs/Letters,%20Email%20Wording/CAR/CAR%20-%20Reg%2014%20(Email).docx?d=wc5b48df72e3a4a6496e8cf77c4c3aade&csf=1&web=1&e=qH6BMr) signed by SEPO/Spec 2 level or above). This effectively stops the determination and will only begin again once the required information has been supplied [Regulation 16(2)(b)].

### 4.2.4 Setting Conditions

Once the information supplied is acceptable, the activity should be registered. SEPA Registry then forwards to the applicant the Notification of Registration [CAR-R – New Sewage Template](https://scottishepa.sharepoint.com/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Permits/CAR-PS/CAR-R%20-%20New%20Sewage%20Template.docx?web=1)

which contains the registration details that the discharger is legally required to comply with. For new discharges this includes address of site, NGR, population equivalent and type of treatment. The registration also requires that the treatment system will not cause pollution and requires the treatment system (septic tank, biodisc etc) to be maintained.

The Notification also gives the applicant the right to appeal any conditions of the Registration.

### 4.2.5 Upgrading Treatment for Existing Registered Discharges

There may be occasions when a registered discharge is causing a significant environmental impact, requiring remedial action. Upgrading in treatment can be addressed by various means such as:

* A SEPA-initiated variation of the registration details to require improved treatment.
* Serving a Notice under Regulation 32 requiring specific work to be undertaken.
* A Licence can be imposed under Regulation 10.

### 4.2.6 Variation of Registered Discharge Details

SEPA may vary or the operator may apply to vary a registration. If the details associated with a registration (such as the properties associated with the discharge etc) change, then an operator-initiated variation must be submitted with the appropriate fee. Refer to [WAT-RM-09: Modifications to CAR Authorisations](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-RM-09) for details.

# 5 Licences (<50 p.e.)

## 5.1 Existing Unlicensed Discharges

Refer to section 3.1.

## 5.2 General

New sewage discharges to the water environment from more than 3 domestic properties or for non-domestic properties, up to and including 15p.e., must be licensed by SEPA. Due to their size, these discharges are of intrinsically higher risk than registered sewage discharges. Refer to section 6 for further considerations for discharges >50 p.e.

An authorised person must be named on the licence. The authorised person is the person specified in a licence who shall secure compliance with the terms of the licence. The authorised person can be a named individual or a body corporate. (In certain exceptional situations, SEPA can issue a licence with an unincorporated/voluntary association such as a residents association as the authorised person. Contact Water Legal for further advice.

### 5.2.1 Advertising and Consultation

Refer to [WAT-RM-20: Advertising and Consultation](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-RM-20).

## 5.3 Determining the Licence Application

This section provides guidance on how to determine the application. If an applicant can provide sufficient technical information and justification as to why the approach provided here should not be followed, this should be considered and passed to the Water Resource Unit to check that any alternative measures will be protective of groundwater.

* **Public Sewer Network**

You should check the GIS to see how far from the main sewer the proposed discharge is. Where the site or proposed discharge point is within, or immediately adjacent to a sewered area SEPA will be minded to refuse the application, see section 3.3.

* **Assessing Impacts on Areas Designated for the Protection of Habitats and Species.**

A national agreement between SEPA and Nature.Scot has identified environmental standards and criteria required to protect designated sites. SEPA will undertake the SEPA Conservation test using [WAT-SG-90 Application of environmental standards in assessing risks to river and loch Natura 2000 interests](https://www.sepa.org.uk/media/219920/wat_sg_90.pdf).

* **Assessing Impacts on Groundwater abstractions**

The prior investigation required to be submitted in section 5 of the application Form B should have identified all local abstractions. The location of each abstraction should be marked on a map indicating whether it is a spring, well or borehole.

The prior investigation should have confirmed if the development is to be supplied by mains water or a private water source and whether, if applicable, the source location is marked on the map. A check should also be made for authorised potable abstractions under CAR by checking on GIS. The applicant should be asked to confirm the presence of water supplies shown on this layer.

If there are any abstractions within 50m of the discharge (including that of the property of discharge application) the discharge should normally not be permitted and must be relocated. (Where the discharge is down gradient of the abstraction it may be possible to allow the discharge but assessment by the Water Resource Unit will be needed to confirm this.)

If there are any abstractions used for drinking, food processing or farm dairies within 500m of the soakaway then the Water Resource Unit should be consulted. It will help the Water Resource Unit to consider the risk if you could supply then with information: the location of the discharge, the source of the supply, the type of the supply, the type of use and frequency of use, if it is a borehole, the borehole depth and depth of any casing.

If there are any disused or backfilled wells, springs or boreholes within 50m consideration should be given to the possibility that they could act as a preferential flow path for contaminants to enter groundwater. Subject to this assessment by WRU, soakaways could be constructed within 50m of a disused or filled in well, spring or boreholes as long as the prior investigation demonstrates that the risk to general groundwater quality is low.

The applicant may need to supply further information, such as the use of the water supply, and/or a site visit might be necessary.

**Figure 2 Process Flow for Licences Between 15 and 50 p.e.**

Yes

No

Yes

Is the infiltration system within 50m of an abstraction?

Refuse authorisation (unless discharge risk to water environment shown to be acceptable)

Yes

Yes

No

Is discharge existing?

No

Use subsoil description & Vp values to decide appropriate level of treatment, See Table 1.

Relocate discharge / discharge to surface waters / treat using filter system

Is fissure flow suspected?

Yes

Examine trial pit logs and results of percolation tests

Don’t know

No

Is there at least 1m of unsaturated zone (based on winter water table) beneath the discharge pipes?

If water table depth examined in summer or autumn (low water level) test soil for mottling as indicator of seasonally high water table

Yes

No

No

Yes

Has applicant demonstrated on-site that system will function adequately?

No

Is there an extreme slope?

No

Refuse authorisation/Request relocation of discharge

Yes

Is risk to surface waters, spring, field drain or wetland acceptable?

No

Is the infiltration system within 10m of a surface water or field drain, or within 50m of a spring or wetland?

Yes

Consult hydrogeologist: Is abstraction at risk from discharge?

Is the infiltration system within 500m of a potable abstraction?

No

Yes

No

Request applicant to complete investigation form

Has applicant completed prior investigation form?

Request appropriate upgrade

No

Yes

Licence the discharge

Yes

Is discharge satisfactory?

* **Surface Water, Springs, Field Drains and Wetlands**

Groundwater supplies base flow to adjacent surface waters and so discharges to groundwater have the potential to impact on nearby surface waters. In addition, field drains can provide a rapid flow path for any discharged effluent to be routed into surface waters. Springs are a reflection of the groundwater table at the ground surface. Any effluent discharged to a soakaway system could appear at the surface in nearby springs, this is especially the case in fissured aquifer systems where springs can be intermittent and the effluent is subject to only limited attenuation and dilution.

Due to the risk of contamination of surface water, springs, field drains and wetlands, any proposed discharge within 10m of surface waters or field drains or within 50m of springs or wetlands should be avoided unless SEPA can be satisfied that the risk of impact is negligible. It is recommended that any discharge in a flood risk area should also be avoided.

Where the discharge is located within these screening distances or in an area at risk of flooding, the applicant should be contacted to seek agreement on a more appropriate location

* **Unsaturated Zone**

Superficial deposits overlie bedrock and have a primary porosity whereby water can move through the pore spaces between the grains of material. Where these materials are unsaturated, pollutant attenuation processes are often enhanced.

The depth of the unsaturated superficial material can be determined from the information on depth to groundwater from the trial pits as well as the depth of the invert of the distribution pipes.

The unsaturated superficial material can provide some attenuation of contaminants. For example, in silty material, ammonia can be retarded by the process of cation exchange. This delays the arrival of ammonium at the water table in continuous discharges. It should be noted that, where ammonia concentrations are elevated the exchange sites quickly become exhausted (filled with ammonium ions) and the capacity of the material to retard ammonia is reduced.

In addition, the unsaturated zone superficial material may be effective in removing pathogens and in low permeability situations can slow the flow of effluent providing some time for contaminants to break down before they enter groundwater.

If, based on the seasonally highest water table, there is less than 1m of unsaturated superficial material beneath the discharge only limited attenuation of contaminants and bacteria is likely. In this situation an alternative means of discharge may be considered or further investigations and probably a quantitative risk assessment involving fate and transport modelling will be required to demonstrate that the discharge will not pose a risk to the water environment. It is important to stress to the applicant that even if more investigation and modelling is undertaken the application may still be refused if the discharge poses an unacceptable risk to the water environment.

Sites assessed in the summer when the water table is low, should be examined for soil mottling, which can indicate the position of a seasonally high water table.

Soil colour is a good indicator of the state of aeration of the subsoil:

* Brown, reddish brown and yellowish brown  
  Indicates free draining unsaturated subsoil that is in the oxidised state at all times.
* Dull Grey  
  Indicates saturated subsoil, in a reduced state.

Mottling of the soil layer can indicate the height to which the water table rises in periods of high rainfall. Mottling in a grey matrix (grey with reddish brown or rusty mottles or staining) indicates aeration along old root channels and cracks while the matrix remains reduced; this soil layer is saturated during part of the year. Mottling in a reddish brown matrix (reddish brown soils with grey mottles or staining) indicates that although the soil is predominantly unsaturated, some areas of the matrix remain reduced for part of the year.

If the nearby surface water is subject to flooding then it is possible that the unsaturated zone beneath the soakaway could be reduced at these times. This should be taken account of when considering the depth of the unsaturated zone in flood risk areas.

* **Slope**

It is more difficult to install pipework and ensure that the wastewater will stay in the soil if the land has an extreme slope (more than 5 degrees). For this reason areas with extreme slopes are not suitable for the location of soakaways unless the applicant can demonstrate via on site assessment that the soakaway will adequately function in these areas.

* **Vp Values and the Subsoil**

Sites which have a low Vp value present a high risk to groundwater, as low Vp values indicate rapid infiltration of effluent which results in limited attenuation of contaminants. Low Vp values could be due to high permeability strata such as gravels or flow through preferential pathways such as those caused by tree roots, fissuring in high clay content soils or in bedrock.

To determine whether low Vp values are due to flow through fissures or high permeability strata such as sands and gravels, check the trial pit information. This should indicate whether bedrock has been encountered, whether there are any preferential flow paths present (such as those caused by tree roots) and the nature of the subsoil.

In many Scottish bedrock aquifers groundwater flows via fissures. Fissure flow should therefore be suspected if:

* Bedrock has been encountered;
* If a preferential flow path has been noted on the trial pit log, or
* If low Vp values are present in moderate to low permeability strata such as silts.

Where fissures are present, if possible, the soakaway should be relocated, or the effluent discharged to surface waters. If these options are not possible, then secondary or tertiary treatment should be considered.

Mound soakaways are not recommended for licence level discharges, due to the increased likelihood of problems occurring from higher loadings/flows.

The level of treatment required will depend upon the permeability of the material. For example, discharges to systems constructed with moderate permeability material may not need to be treated to as high a standard as that for discharges to a filter system constructed with a higher permeability material because of the greater retention time of the former. Table 1 (Licence standards and requirements) gives some indication of the relative percolation rates from different filtration materials and discharge quality required to prevent groundwater pollution.

For discharges where the Vp values and information from the trial pits indicate that the strata are not fissured, the Vp values should be used in conjunction with the description of the subsoil to derive an appropriate level of treatment. The Licence standards and requirements table below gives some guidelines on the level of treatment required and the ammonia standard which could be set in the licence. It should be noted that these standards are intended as a guide only and other standards could be used if they are adequately justified (in a quantitative manner).

## 

**Table 1 Possible licence standards and requirements**

|  |  |  |
| --- | --- | --- |
| Material | Typical percolation rate (sec/mm) | Possible Licence Standard |
| Medium fine SAND | <15 | Secondary treatment designed to meet an effluent of mean quality not exceeding 5mg/l ammonia |
| Silty SAND | 15-75 | At lower end of range consider Secondary treatment – upper range primary may be sufficient.\*\* |
| Sandy SILT | >75 and <100 | Primary treatment. |
| >100 and <140 | Secondary treatment or wetlands |
| >140 | Consider other disposal options such as discharge to surface waters. Only where this is not possible a constructed wetland or propriety filtration system should be considered.\*\*\* |

\* From Table 5 of [Code of Practice: Wastewater Treatment Systems for Single Houses](http://www.epa.ie/pubs/advice/water/wastewater/code%20of%20practice%20for%20single%20houses/).  
\*\*The requirement for secondary treatment should be assessed on whether there are nearby surface waters which would be at risk from ammonia. The secondary treatment plant should be designed to produce effluent with a mean ammonia concentration of no more than 10mg/l.  
\*\*\* As required by [Technical Handbook](https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/): (Section 3: Environment).

If the subsoil is composed of clay then it is likely to have a low permeability and so the effluent may not soak away. In these cases a discharge to land is unlikely to be technically feasible and discharge to surface water may be required.

Peat can be excellent at attenuating contaminants. However, peat often indicates wet conditions where soakage of effluent is inhibited to an unacceptable degree. In some areas peat is drier and subject to cracking which would allow effluent to rapidly by-pass this layer. Consequently Vp values in peat can be variable. Discharges to peat may therefore be acceptable in some locations but only after careful consideration of the proposed measures and prior investigation information.

* **Area and Length of Soakaway**

The area of soakaway (more correctly, the area of sub-surface drainage trench) is usually calculated based on the Vp value as follows:

A = Vp x p.e. x 0.25

(A in m2 and Vp in sec/mm)

Population equivalent (p.e.) for domestic housing is equivalent to the figure P in the British Water Code of Practice [Flows and Loads](http://www.britishwater.co.uk/Search/Default.aspx?q=flows+and+loads) and should be determined using the number of bedrooms as referred to in section 5 of the code.

p.e. for non-domestic secondary treated sewage effluent should be determined by multiplying the number of people using the system by the flow for that activity and dividing by the flow for one person in one day. Information on flow loading is contained in [Flows and Loads](http://www.britishwater.co.uk/Search/Default.aspx?q=flows+and+loads).

Non-domestic septic tank effluent, from a cafe etc, is often significantly stronger than domestic effluent. In this case it would be desirable to determine the p.e. based on the BOD loading – refer to section 3.4. This ensures that the soakaway has adequate attenuation capacity for the stronger effluent. NB this only applies for septic tank non-domestic effluent.

Example 1: House with 3 bedrooms

A = Vp x 5 x 0.25

Example 2: Office / Factory without canteen serving 10 people

A = Vp x 10 x 50/150 x 0.25

For secondary treated effluent, the area can be reduced by 20%, i.e.

A = Vp x p.e. x 0.2

This results in small soakaway areas for low Vp values. Maximising the area of the soakaway maximises any cation exchange available. Research also has suggested that bacteriological groundwater pollution is minimised as long as the loading is not too great. Therefore it is recommended that where Vp values are less than 15 sec/mm, which could result in a small soakaway area and a high loading, that the area of the area of distribution should be increased.

The minimum area required (A) can be calculated by:

A(m2) = 3.6 x p.e.

Maximising the area of distribution, perpendicular to the groundwater flow direction (or the slope of the topography which can be used as a guide to the groundwater flow direction in absence of more detailed information) maximises the dilution with the groundwater flowing under the site. Developers should also consider a dosing system (using a bell siphon or pump) which will help ensure an even distribution of the treated effluent.

## 5.4 Licence Conditions

When drafting the licence staff should use the relevant sewage licence template.

Once submitted, SEPA has 4 months in which to determine a licence. During this period informal discussions may take place regarding the proposed discharge. Once the licence conditions have been drafted, then SEPA will forward a copy to the applicant for their comments prior to issuing the licence.

Where the SEPA officer requests further information [Regulation 14(1)] and considers that the discussions will extend beyond the four month statutory determination period [Regulation 17(1)(b)] then the officer should request the information in writing as part of a request for further information (Refer to [CAR Reg 14 email](https://scottishepa.sharepoint.com/:w:/r/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Other%20Docs/Letters,%20Email%20Wording/CAR/CAR%20-%20Reg%2014%20(Email).docx?d=wc5b48df72e3a4a6496e8cf77c4c3aade&csf=1&web=1&e=qH6BMr) signed by SEPO/Spec 2 level or above). This effectively ‘stops the clock’ and the determination ‘clock’ will only begin again once the required information has been received or the date required for the information has passed [Regulation 17(2)(b)].

The [CAR Decision Document](https://scottishepa.sharepoint.com/:w:/r/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Other%20Docs/Decision%20Docs/CAR%20-%20Decision%20Document-NEW.docx?d=w44aba6f4cd964f31abd4195c1735fa4b&csf=1&web=1&e=Qx7s2F) should be completed.  This document includes details of how the licence were determined. This record will prove useful in situations such as when reviewing the licence conditions, if there was an appeal against a Notice or in the event of complaints from the operator or the public regarding the licence conditions.

The discharge should be assessed in order to determine whether inspection or sampling is required. Refer to [DRM-G-006](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=DRM-G-006).

### 5.4.1 Setting Numeric Conditions

For septic tank discharges, SEPA will not set a numeric condition for suspended solids (unless the discharge is on the sampling programme) but will include a condition on the authorisation that will require that the facility is maintained.

For circumstances that require a biological treatment plant then SEPA will require secondary treatment designed to produce an effluent with a mean ammonia concentration of no more than 10mg/l.

Where ground conditions result in a low Vp value and/or sensitive receptors are nearby, a significant reduction in ammonia is likely to be required prior to the discharge. SEPA officers should require the installation of a secondary treatment designed to produce effluent with a mean ammonia concentration of no more than 5mg/l. For sites in close proximity to sensitive receptors, secondary treatment may also be required to reduce reactive phosphorus concentrations prior to discharge to land.

Where the discharge is to be monitored SEPA will set two-tier standards. Refer to [WAT-RM-03: Regulation of Sewage Discharges to Surface Waters](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-RM-03) for details.

### 5.4.2 General Conditions

**Maintenance**

Conditions requiring maintenance of the treatment facility so that it operates in good working order should be included in licences. Septic tanks and primary settlement tanks should be de-sludged at appropriate intervals to prevent excessive carry-over of suspended solids – a minimum frequency of once every two years is advised. Most package sewage treatment plants require a power source and a visual or audible alarm system to notify of plant breakdown or power failure may be a licence requirement for larger discharges.

**Flow Monitoring**

Flow monitoring is not normally required for discharges of sewage effluent from septic tanks or small STW. Further detail can be found in WAT-SG-13.

**Sampling Points**

For PEs ≥200 a facility for inspecting and obtaining representative samples of the discharge is required. The sample point, at which point the effluent numeric conditions would apply, should be immediately after the treatment system and prior to the discharge to soakaway.

Details of a sampling chamber allowing easy access into the manhole to sample using a container can be found in the [Technical Handbook](https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/) (Section 3: Environment).

If the discharge is to be routinely monitored, the site will require a health and safety risk assessment. For new developments, where the sampling point has not yet been constructed, the requirement for safe access should be discussed with the discharger prior to the licence being granted.

# 6 Discharges from Properties Serving >50 p.e.

## 6.1 Further Requirements when dealing with a Discharge >50 p.e.

The Water Resource Unit should always be consulted when dealing with discharges from dwellings serving more than 50pe.

Due to the potential impact upon groundwaters from such a large sewage discharge, applicants should be advised that stringent treatment standards and significant investigatory and monitoring work will be required.

An intrusive site investigation and a hydrogeological risk assessment should be carried out by a competent person on behalf of the developer before the licence is issued. In most cases a down-gradient monitoring point, such as a borehole or piezometer, should be provided by the developer so that ongoing monitoring can be carried out. An upgradient monitoring point is also recommended to allow background water quality to be assessed.

As a minimum it is recommended that the intrusive investigation should include the installation of at least 3 boreholes/piezometers.

It is recommended that the scope of the investigation should be agreed with WRU before it is undertaken.

The following information should be recorded/interpreted from the boreholes:

* Location of boreholes
* Borehole logs and construction details
* Groundwater quality (including nitrate, ammoniacal-nitrogen, phosphorus)
* Depth to groundwater (in mAOD and mbgl and should record the seasonally highest water table)
* Groundwater flow direction
* Hydraulic gradient
* Aquifer permeability (from testing of the boreholes)
* Description of the unsaturated zone, ideally supported by particle size distribution analysis (depending on the scale of the discharge, further soil testing including cation exchange capacity testing may be requested also)

The above information, together with consideration of the presence and concentration of various substances in the effluent, should be used to quantify the impact that the discharge will have on groundwater. This should then determine the level of treatment required and what monitoring should be carried out.

## 6.2 Monitoring the Discharge

If the discharge presents a significant risk to the environment then the discharge should be monitored. The nature of the monitoring should be discussed with the Water Resources Unit and the C&B Unit Manager. Refer to [DRM-G-006](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=DRM-G-006).

# 7 Regulating Willow Treatment Systems

## 7.1 Introduction

Constructed wetland systems can provide effective treatment of the effluent prior to being discharged to the water environment whilst providing additional benefits such as habitats. In some cases, the discharge of effluent is to a willow treatment system. This generally consists of a septic tank or other treatment system followed by one or more constructed wetlands, with the effluent then being discharged to an area of planted willows where evapotranspiration takes place. In such systems the willows both reduce the volume of water and improve its quality.

An unlined willow soakaway in an area of permeable soils is effectively a soakaway and the proposal should be regulated as an indirect discharge to groundwater. However, where infiltration is limited or a liner is used, an overflow from the willow area into a nearby watercourse or created wetland may be incorporated into the design.

Under rare circumstances, willow systems can be designed so there is no discharge from the system; either from the base or by overtopping the sides, but there is no evidence that these would be suitable for continuous year round use in a Scottish climate. Therefore any proposals for sealed systems without a designed-in overflow should be for seasonal summer use only and applicants will need to demonstrate that:

* The evapotranspirational capacity of the willows is sufficient for the discharge
* The area is sufficient to prevent overtopping

Clearly, these seasonal systems are more likely to operate without overtopping if they are located in areas of lower rainfall.

For year round use an overflow from the system should be included to accommodate periods when inputs exceed the evapotranspiration capacity.

## 7.2 Level of Authorisation

The use of a willow treatment system is considered to be an activity liable to cause pollution of the water environment, i.e. a controlled activity. The level of authorisation should be the same for other treatment systems of sewage effluent.

## 7.3 Design and Construction

For small scale developments in low permeability soils, e.g. where the percolation value (Vp) is >100secs/mm, a liner would not normally be required. Larger scale developments in similar situations will require a risk assessment, details of which should be agreed with SEPA.

Lined systems pose an environmental risk where:

* There is a rupture or overtopping of the liner
* Where an inadequate liner has been installed
* Where installation has not been appropriately undertaken

The following information regarding lined systems may need to be submitted to and agreed with SEPA to ensure an appropriate degree of environmental protection. Consultation with SEPA’s Water Resources Unit may be necessary;

* Type (e.g. HDPE, clay) and specification (thickness, permeability etc) of the liner. In general some sort of mineral liner such as re-engineered clay or a geosynthetic clay liner should be used rather than a membrane liner
* Sub-grade preparation and liner protection
* Method of installation (e.g. welding etc)
* Any construction quality assurance (CQA) checking
* Any maintenance of the system that is required.

## 7.4 Environmental Risk Assessment

The level of risk assessment will depend upon the geological conditions, the size of the discharge and whether the system is for seasonal use only.

Liner requirements are discussed in section 7.3.

A water balance calculation may be required to determine the size of the system, taking into account local evapotranspiration rates and seasonal usage.

Strong evidence of evapotranspiration values will be required before some form of assessment is undertaken to consider sensitive receptors which could be impacted should a failure of the treatment system take place. As a minimum, the applicant should be asked to confirm that these systems are not located within 250m of a potable abstraction for lined/low permeability systems or 500m of a potable abstraction for discharges to soakaway, or 10m of a field drain, surface water or wetland.

## 7.5 Licence Conditions

The relevant licence template should be used.

### 7.5.1 Fully Sealed Systems

For fully sealed systems numeric conditions are normally not necessary but licence conditions should cover the following general points.

* The controlled activity shall be the treatment of sewage effluent in a wetland system.
* Require seasonal use only
* For these sealed systems with no overflow, the associated waters should be groundwater.

## 7.6 Monitoring

For those systems with a designed in overflow, [DRM-G-006](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=DRM-G-006) should be used to determine any requirement for routine monitoring. For sealed systems, groundwater monitoring is not usually required unless serving over 100PE in vulnerable groundwater situations (for example on sand and gravels or where another sensitive receptor exists nearby).

If required, monitoring should consist of at least one down gradient groundwater monitoring point which should be sampled for relevant chemical parameters, usually ammonia and/or nitrate. Alternative monitoring could be considered in some situations, for example at a nearby downstream watercourse.

The Water Resource Unit should be contacted for specific advice on groundwater monitoring requirements.

# 8 References

## 8.1 Key References

* [WAT-PS-06-08: Policy and Supporting Guidance on Provision of Waste Water Drainage in Settlements](http://www.sepa.org.uk/regulations/water/pollution-control/pollution-control-guidance/)
* [WAT-RM-03: Regulation of Sewage Discharges to Surface Waters](https://www.sepa.org.uk/regulations/water/pollution-control/pollution-control-guidance/)
* [WAT-RM-09: Modifications to CAR Authorisations](https://www.sepa.org.uk/regulations/water/guidance/)
* [WAT-RM-20: Advertising and Consultation](https://www.sepa.org.uk/regulations/water/guidance/)
* [WAT-RM-22: Managing Refusals and Appeals](https://www.sepa.org.uk/regulations/water/guidance/)
* [WAT-SG-13: Municipal Sewage Treatment Works (STW)](https://www.sepa.org.uk/regulations/water/pollution-control/pollution-control-guidance/)
* [WAT-SG-90 Application of environmental standards in assessing risks to river and loch Natura 2000 interests](https://www.sepa.org.uk/regulations/water/guidance/)

## 8.2 Other Documents

* [CAR Application Forms](http://www.sepa.org.uk/regulations/authorisations-and-permits/application-forms/#Water) including Guidance for Applicants (www.sepa.org.uk)
* [DRM-G-006](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=DRM-G-006) DREAM Hazard and Risk Assessment Guidance: Compliance Monitoring (Inspection, Sampling & Data Returns)
* [Environmental Regulation (Scotland) Charging Scheme](http://www.sepa.org.uk/regulations/authorisations-and-permits/charging-schemes/charging-schemes-and-summary-charging-booklets/) (www.sepa.org.uk)
* [Flows and Loads](http://www.britishwater.co.uk/Search/Default.aspx?q=flows+and+loads) British Water Code of Practice ([www.britishwater.co.uk/](http://www.britishwater.co.uk/))

* [British Water Codes of Practice](https://www.britishwater.co.uk/Publications/codes-of-practice.aspx)
* [Mound filter systems for the treatment of domestic wastewater](http://www.brebookshop.com/search.jsp?userSearch=br478&userPublisher=&userProductType=) BR478, (www.brebookshop.com)
* GPP 4 Treatment and disposal of sewage where no foul sewer is available NetRegs (www.netregs.org.uk)
* [Technical Handbook](https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/): Domestic Buildings Section 3: Environment ([www.scotland.gov.uk/](http://www.scotland.gov.uk/))

## 8.3 Forms and Templates

* [CAR Application Forms](http://www.sepa.org.uk/regulations/authorisations-and-permits/application-forms/#Water) including Guidance for Applicants (www.sepa.org.uk)
* [CAR Reg 14 email](https://scottishepa.sharepoint.com/:w:/r/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Other%20Docs/Letters,%20Email%20Wording/CAR/CAR%20-%20Reg%2014%20(Email).docx?d=wc5b48df72e3a4a6496e8cf77c4c3aade&csf=1&web=1&e=qH6BMr)
* [CAR-R – New Sewage Template](https://scottishepa.sharepoint.com/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Permits/CAR-PS/CAR-R%20-%20New%20Sewage%20Template.docx?web=1)
* [CAR-R – Existing Septic Tank Template](https://scottishepa.sharepoint.com/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Permits/CAR-PS/CAR-R%20-%20Existing%20Septic%20Tanks%20Template.docx?web=1)
* [CAR Sewage 16-100 PE template](https://scottishepa.sharepoint.com/:w:/r/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Permits/CAR-PS/CAR%20Sewage%2016-100%20PE%20template.docx?d=wfee2c2629db442cfbb0c56fa2e2dd686&csf=1&web=1&e=L3bxHV)
* [CAR Sewage 101-200 PE template](https://scottishepa.sharepoint.com/:w:/r/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Permits/CAR-PS/CAR%20Sewage%20101-200%20PE%20template.docx?d=w1a20d2bf5a354ff193c836998b8b0708&csf=1&web=1&e=p7waSj)
* [CAR Sewage 201-1999 PE template](https://scottishepa.sharepoint.com/:w:/r/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Permits/CAR-PS/CAR%20Sewage%20201-1999%20PE%20%20template.docx?d=wde23487bb6b24f8895c863c0bfc23f29&csf=1&web=1&e=GMEhjk)
* [CAR Sewage ≥2000 PE template (new template not currently available)](https://scottishepa.sharepoint.com/:f:/r/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Permits/CAR-PS?csf=1&web=1&e=Scc9hx)
* [CAR Decision Document](https://scottishepa.sharepoint.com/:w:/r/sites/PermittingCells/Shared%20Documents/Approved%20Templates%20and%20Docs/Templates%20-%20Other%20Docs/Decision%20Docs/CAR%20-%20Decision%20Document-NEW.docx?d=w44aba6f4cd964f31abd4195c1735fa4b&csf=1&web=1&e=Qx7s2F)

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