



Water Use

Regulatory Method (WAT-RM-03)

Sewage Discharges to Surface Waters

Version: v8.0

Released: Oct 2016

Copyright and Legal Information

Copyright © 2016 Scottish Environment Protection Agency (SEPA).

All rights reserved. No part of this document may be reproduced in any form or by any means, electronic or mechanical, (including but not limited to) photocopying, recording or using any information storage and retrieval systems, without the express permission in writing of SEPA.

Disclaimer

Whilst every effort has been made to ensure the accuracy of this document, SEPA cannot accept and hereby expressly excludes all or any liability and gives no warranty, covenant or undertaking (whether express or implied) in respect of the fitness for purpose of, or any error, omission or discrepancy in, this document and reliance on contents hereof is entirely at the user's own risk.

Registered Trademarks

All registered trademarks used in this document are used for reference purpose only. Other brand and product names maybe registered trademarks or trademarks of their respective holders.

Update Summary

Version	Description
v1.0	First issue for Water Use reference using approved content from the following documents: <i>CAR_Manual_-_sewage_discharges_to_surface_water.doc</i>
v1.1	Added references to Position Statements <i>PS-06-01</i> and <i>PS-06-01</i>
v1.2	Revised <i>low dilution</i> text sections 4.1.3, 5.2.1 & 5.3.1
v2.0	Revisions as detailed in <i>RM_03_PS_SurfaceWater 25 Apr.doc</i> : Registration threshold revised to ≤ 50 p.e./ Sec. 3.2 added "Modifying Authorised Discharges" / Sec. 7.1 "Descriptive Conditions" modified / Refs added to WAT-SG-19 and WAT-LETT-14
v3.0	Fig 1 numbering revised, Links revised to new website, section 3.6 added, new template applied
v3.1	<i>Two-tier Multiplier</i> hyperlink revised.
v4.0	Revised <i>Flows & Loads</i> reference and value (180 l/head/day), text added (s 6.3.3 para 2, s 7.2.1 para 5), <i>FRS</i> now <i>Marine Scotland</i>
v5.0	Text added: <i>Augmenting river flows</i> (sections 4.2.2 & 5.3.1), NEMS/CLAS requirements for Priority Hazardous Substances (section 7.2.5). Conservation procedure revised (section 5.2)
v5.1	Section 7.22 para 6: Septic tank limits detail updated
v6.0	CMS links reviewed and updated.
v6.1	Minor corrections to external link references (s4.2.2, s6.2.2, s6.3.3, s7.2.6)
v7.0	Change of effluent standards to mean standards for unsampled discharges. New section: 3.7 and 6.2.5, changes to: 3.2.1, 4.2.2, 5.3.2, 7.1 and 7.2.
v8.0	Strengthening of wording that SEPA are minded not to authorise discharges where connection to public sewer is possible.

Table of Contents

1. Key Points	5
2. Process Flow	6
3. Pre-Application Consultations	7
3.1 Existing Unauthorised Discharges	7
3.2 Modifying Authorised Discharges	7
3.3 Connection to the Public Sewer and Adoption by Scottish Water	8
3.4 Discharge to Land	9
3.5 Population Equivalent.....	9
3.6 Shared Systems	9
3.7 Package Treatment Plant Certification to EN12566 Part 3.....	9
4. Sewage Registration Applications	11
4.1 Receipt of Application.....	11
4.2 Determine Whether Treatment Appropriate	13
4.3 Registering the Discharge	17
4.4 Upgrading in Treatment for Existing Registered Discharges.....	19
4.5 Variation of Registered Discharge Details.....	19
5. Sewage Licence Applications.....	20
5.1 Licence Applications.....	20
5.2 Receiving Environments.....	21
5.3 Determining the Licence Application	22
5.4 Municipal STWs	26
5.5 Upgrading in Treatment for Existing Licensed Discharges.....	26
5.6 Variation of Licence Conditions.....	27
6. Determining Appropriate Treatment	28
6.1 Environmental Drivers	28
6.2 Treatment Options.....	28
6.3 Assessing Impact of the Discharge	31
7. Licence Conditions	33

7.1	Descriptive Effluent Quality Conditions.....	33
7.2	Numeric Effluent Quality Conditions.....	33
7.3	General Conditions.....	36
7.4	Other Considerations.....	37
	References	39

1. Key Points

This guidance concerns sewage discharges to surface water. For sewage discharges to land please refer to *WAT-RM-04: Regulation of Indirect Sewage Discharges to Groundwater* for guidance.

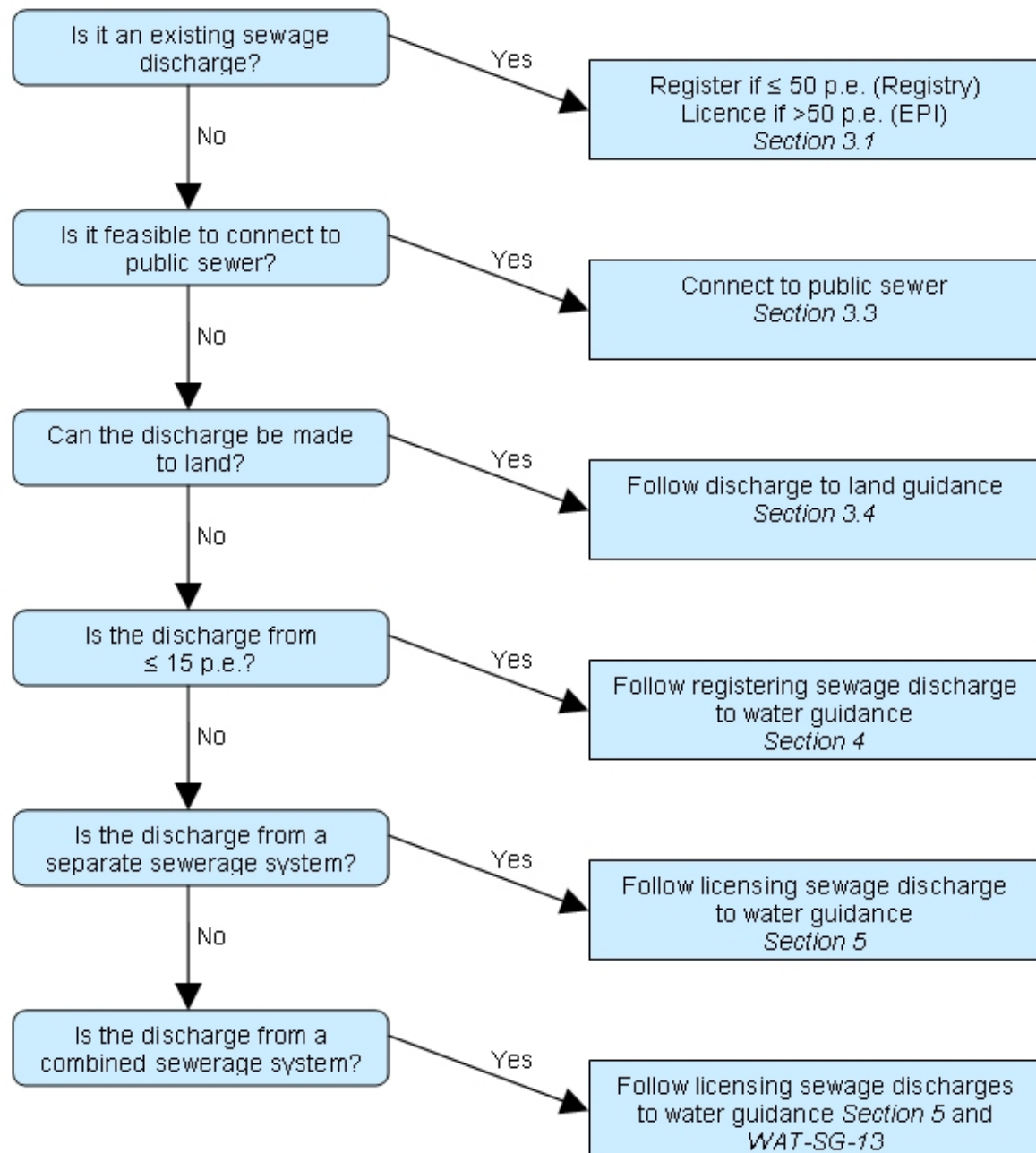
For sewage discharges from a combined sewerage system refer to *WAT-SG-13: Municipal Sewage Treatment Works (STW)* in addition to this document.

The guidance is designed for use with the following licence templates:

- *WAT-TEMP-04: Septic Tank Licence Template*
- *WAT-TEMP-05: Separate Sewage System Licence Template*
- *WAT-TEMP-06: Municipal Sewage Treatment Works Licence Template*

2. Process Flow

Figure 1 Decision tree for sewage discharge application



3. Pre-Application Consultations

The flowchart in *Figure 1* details the initial steps which should be followed when receiving a query regarding a proposed sewage discharge.

3.1 Existing Unauthorised Discharges

When an existing unauthorised sewage discharge from a population equivalent (p.e.) (see section 3.5) of less than or equal to 50 (9 homes) is brought to the attention of SEPA, the discharge should be registered. The threshold of 50 p.e.(9 homes) is used for existing discharges, whereas 15 p.e. (3 homes) should be used for new sewage discharges. 'Existing' means that the discharge was in existence before 1 April 2006.

NOTE: A proposed increase in p.e. for an existing unauthorised discharge should be assessed as a new discharge since there is an increase in environmental risk. However a pragmatic approach should be taken, depending on the scale of the increase and the resultant risk to the environment.

A registration form should be submitted, and SEPA Registry will register the discharge. It should be noted that for these existing discharges there will be no consultation with Local Operations and no assessment as to whether the discharge is causing an environmental impact. Furthermore there will be no assessment as to whether the discharge may affect a Protected Area such as an area designated for nature conservation.

The only exception to this is for existing untreated or raw discharges. In these cases the application should be passed to Local Operations. Local Operations then contact the applicant/solicitor to agree an appropriate form of treatment and timescale and this is inserted into the Notification of Registration (*WAT-LETT-10: Discharge Notification (Sewage)*). Untreated discharges should be assessed in accordance with *WAT-PS-08-01: Untreated Sewage Discharges*.

An unauthorised sewage discharge from a p.e. of more than 50 (9 homes) must be licensed. A date for submission of a full application should be agreed with the discharger. Provided there is no evidence of an environmental impact (as determined by a site visit), the discharge should be licensed on the basis of the existing system. If there is an unacceptable impact, progressive improvements within a reasonable timescale, taking account of costs and benefits, should be agreed with the discharger and conditioned within the licence.

3.2 Modifying Authorised Discharges

3.2.1 Modifying Registered Discharges

If the p.e. of an existing registered discharge is increased (e.g. due to an additional house joining the system) the registration requires modification.

If the p.e increases but stays within the registration range (e.g. from 5 to 10p.e./1 to 2 homes) an application for variation of registration is required. If the p.e increases above 15 / 3 homes (e.g. from 10 to 20p.e. /2 to 4 homes) then a new application for a simple licence should be made. If the p.e increases for a deemed registration (e.g. from 20 to 30p.e. /4 to 6 homes) then a new application for a simple licence should be made.

The procedure for variation of registrations as described in *WAT-RM-09: Modifications to CAR Authorisations* 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 loading requires a variation of the licence. Refer to *WAT-RM-09: Modifications to CAR Authorisations* for details.

3.3 Connection to the Public Sewer and Adoption by Scottish Water

The proliferation of small STWs and septic tanks in or near sewered areas is to be discouraged. Disposal of foul drainage to the public sewer should always be sought where practicable. This reinforces the need to take full advantage of the planning consultation process to ensure that, where appropriate, connection to the public sewer is a planning requirement for new developments. If connection to the public foul sewer is not a planning requirement, SEPA must ensure that the discharge is appropriately regulated to provide an adequate level of environmental protection. SEPA may refuse a CAR authorisation if a public foul sewer is in close proximity and the applicant should be made aware of this.

SEPA are minded to refuse an application for authorisation to discharge sewage to surface waters or land where the application is within, or immediately adjacent to, the Scottish Water sewered area. SEPA would seek to refuse these applications since this type of treatment is considered a less efficient and less sustainable use of the water environment. Applications would be considered where connection to the sewer network would not be reasonably practical, but the discharge must still meet the same level of treatment as the public system in order to protect the water environment.

Reference should be made to *WAT-PS-06-08: Policy and Supporting Guidance on Provision of Waste Water Drainage in Settlements* 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 Discharge to Land

SEPA operates a general presumption against the direct discharge of sewage effluent (from less than 50p.e. /9 homes) to surface waters. The preferred environmental option is for discharge to land where the ground conditions are suitable i.e. where the percolation value (V_p) is 15 - 100 sec/mm. Refer to *WAT-RM-04: Regulation of Indirect Sewage Discharges to Groundwater* for guidance. Outwith these percolation values, ground conditions indicate high permeability ($V_p < 15$ sec/mm) and low permeability ($V_p > 100$ sec/mm). In such circumstances, the best environmental option which ensures protection of the water environment, groundwater and surface water, should be considered. This may involve a discharge to surface water, in which case this guidance should be followed.

It is always important to consider whether the action required by the guidance is reasonable for the site under consideration.

3.5 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* (British Water Code of Practice).

The Code of Practice can also be used to determine flow and load figures for various types of non-domestic sewage discharge.

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). Information on BOD loading is contained in the latest version of *Flows and Loads*.

For large developments an alternative method for deriving p.e. as described in *WAT-SG-13: Municipal Sewage Treatment Works (STW)* can be followed.

3.6 Shared Systems

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

3.7 Package Treatment Plant Certification to EN12566 Part 3

New sewage domestic discharges from package treatment plants (PTPs) serving up to and including 50 p.e. (9 homes) 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 CAR registrations and unsampled licensed 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. Influent 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 these situations uses.

For situations where EN12566 Part 3 does not apply (i.e. domestic >50pe (>9 homes) 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.

4. Sewage Registration Applications

NOTE: Steps in *Figure 1* flowchart should have been followed prior to this stage.

4.1 Receipt of Application

4.1.1 General

This section does not apply to registrations for existing discharges which should be dealt with in accordance with the guidance in section 3.1.

Sewage discharges to the water environment from a population equivalent of 15 or less are assumed to be relatively low risk. Discharge registrations do not specify a responsible person and will not be routinely monitored.

NOTE: Each septic tank/treatment system discharging to a shared outfall should be registered separately.

However for new discharges SEPA needs to ensure that the treatment proposed for the discharge provides an adequate level of environmental protection for the water environment. It is advisable for the applicant to discuss with SEPA the level of treatment to be provided before a registration form is submitted.

A proliferation of discharges to the water environment may result in an unacceptable impact on water quality. SEPA can assess these cumulative impacts of sewage discharges using a database of authorised discharges. Therefore information relating to the proposed sewage discharge must be kept by SEPA. In addition certain specific items, such as NGR, population equivalent and type of treatment must be entered into CLAS to enable electronic interrogation of the database. The registration form is available on SEPA's website as is the current application fee.

4.1.2 Escalation to a Licence

There are certain exceptional higher risk circumstances in which a discharge of sewage effluent which would otherwise be authorised by registration will require the issuing of a licence.

In these cases the application will be treated as a licence application and the guidance contained in section 5 should be followed. However the registration application charge will still apply in these cases.

Escalation to a licence is likely to occur only in exceptional circumstances where SEPA has to exercise greater control over the discharge and where site-specific conditions are essential. It should be emphasised that if possible, escalation to a licence should be avoided by, for instance, requiring enhanced treatment as a condition of the registration. Escalation should be made only if additional safeguards, such as specific maintenance requirements, are necessary which can only be achieved by licensing. In

addition, licensing allows monitoring to be undertaken (and the relevant subsistence charge applied).

If it is proposed to escalate a registration, then the decision must be agreed by the Regulatory Review Team (RRT).

Escalation to a licence (with specific conditions) would normally only be required in a situation of very limited dilution.

Certain discharges escalated to a licence may also discharge into or may affect a SSSI, SPA or SAC. For these escalated discharges, consultation with SNH must be made.

For any discharges escalated to a licence and where there is a significant risk to a drinking water abstraction, Scottish Water, the Local Authority or the relevant water user must be consulted as appropriate. Escalation will then allow the required 28-day consultation within the statutory timescale for determination of the licence. Refer to *WAT-RM-20: Advertising and Consultation* for more details.

4.1.3 Check Areas on GIS

General

The following areas identified on GIS should be checked:

- If the discharge is to classified waters, check whether the water quality status is good or above. If the water is not of good status and this is due to pollution pressures, then the registration application for an additional discharge may be refused (see *WAT-RM-22: Managing Refusals and Appeals*). However, the discharge may be registered if the additional load is negligible or if the downgrading is due to non-sewage factors such as iron. Frequently the discharge may be to unclassified waters (this may be the case for small watercourses with a catchment of <10km²).
- Depending on the officer's local knowledge, it may be necessary to check GIS for other discharges in order to assess pollution pressures on the water environment. As required, other officers in the local team should be consulted to gain local information.
- Public Sewer Network – 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.

Since any new discharges will only be registered if they do not result in the deterioration of water quality, this will automatically protect sites designated for nature conservation such as SSSIs, SACs and SPAs.

Protected Areas

Protected Areas are given particular protection under the Water Framework Directive. They include areas designated under a number of other EU Directives as well as areas identified to protect the surface water or groundwater within them (Drinking Water Protected Areas).

SEPA is under a duty to ensure that the objectives of each Protected Area are achieved.

The small scale and low risk of sewage registrations means that their impact on Nutrient Sensitive Areas designated under UWWTD and NVZs does not need assessing on a case by case basis.

The location of the discharge relative to designated Shellfish Growing Waters and designated Bathing Waters on the GIS database should be checked. (If the discharge is into or may affect such waters, then the guidance document *WAT-RM-13: Regulation of Microbiological Discharges* should be followed).

NOTE: Direct discharges to Shellfish Growing Waters and Bathing Waters are to be avoided. If any such discharges are authorised, consideration should be made of using reed bed treatment and/or partial soakaway to reduce the microbiological content. Discharges to Shellfish Waters may be allowed providing they don't impact on Shellfish Growing Waters.

4.2 Determine Whether Treatment Appropriate

4.2.1 Determining the Registration Application

If the discharge is an existing unauthorised discharge from ≤ 50 p.e. (9 homes) then it should be registered in accordance with section 3.1.

It is important to realise that it is the impact on the water environment at a local scale which must be assessed rather than assessing the impact on the scale of the overall water body (the scale of which may be many kilometres).

4.2.2 Discharges to Watercourses

Sewage registrations are considered relatively low risk and time consuming modelling of the impact of the discharge is to be avoided if possible. To facilitate processing of applications, several simple rules on required dilution for particular levels of treatment have been developed as described below.

NOTE: These rules do not apply where the discharge is into stretches of watercourses which are not classified, but where there are known serious pollution pressures. Such discharges will require more detailed consideration and alternative treatment conditions may be required. For classified watercourses, discharges into areas of less than good status may be refused.

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

For discharges to watercourses, a measured Q95 flow should be used if one is available. Where no measured low flow is available, a Q95 can be obtained by requesting a Q95 low flow estimate from SEPA Hydrology. SEPA Hydrology will use the Low Flows Enterprise software package. It should be noted, however, that the estimated Q95 flow using Low Flows Enterprise becomes significantly inaccurate for catchments of <5 square kilometres or where there may be significant abstractions / discharges to the watercourse. If additional flow data is available this can be used to decrease some potential inaccuracies. The discharge flow figure should be based on data in the latest version of *Flows and Loads*, or for large developments an alternative method for deriving p.e. as described in *WAT-SG-13: Municipal Sewage Treatment Works (STW)* can be followed.

The location of the outfall pipe in the watercourse should be considered so as to ensure efficient mixing and, for primary discharges, to avoid the appearance of a visible plume of effluent downstream.

Augmenting River Flow to Provide Increased Dilution

Note: Where there is limited dilution SEPA will consider applications for new or modified abstractions or impoundment activities for the purpose of providing extra dilution for a point source discharge to allow further development. This would have the effect of augmenting the natural Q95 and Mean Daily Flow (MDF). For example, the compensation flow from an impounded reservoir could be increased to provide further dilution for a downstream discharge.

- SEPA will apply the relevant environmental assessments and standards to such applications as it would for any other and, where appropriate, specify or vary the abstraction or impoundment licence conditions accordingly.
- This approach could be taken for water resource activities and point source discharges which are part of the same site or process (and therefore operated by the same responsible person), e.g. a freshwater fish farm or distillery.
- This approach may also be considered for separate sites situated any distance apart and operated by different parties. However in this case it will be necessary to set conditions to reflect the fact that the operation of one activity is dependant on the operation of another (e.g. alternative discharge limits for high and low flows). Alternatively, a management agreement between the parties may be required. Any such arrangement should be entered into with caution due to the complications which could arise if one of the activities were to cease. Further advice on how to

progress such a situation may be required in which case officers should contact the WFD helpdesk and/or seek legal advice.

>400:1 Dilution

If >400:1 dilution then primary treatment by a septic tank would be appropriate. However installation of a partial soakaway (see section 6.2.4) with high level overflow would normally be required in addition, especially where there is development pressure or other sources of pollution.

The location of the outfall pipe in the watercourse should be considered so as to ensure efficient mixing and to avoid the appearance of a visible plume of effluent downstream

<400:1 Dilution

If <400:1 dilution then secondary treatment is required as a minimum (Table 1).

Significant pollution pressures

For locations where there are significant existing or anticipated pollution pressures on the watercourse.

Dilution range

- If dilution >100:1 and <400:1, secondary treatment designed to produce effluent with a mean BOD concentration of no more than 20mg/l must normally be provided
- If dilution >30:1 and <100:1, secondary treatment designed to produce effluent with a mean ammonia concentration of no more than 5mg/l must normally be provided.
- If dilution <30:1, enhanced treatment should be provided, the exact nature of which will vary on a case by case basis. Factors which should be taken into account will include dilution available, existing pollution pressures and likelihood of further discharges on the watercourse, proximity of Protected Areas.
 - An example of enhanced treatment is nitrifying secondary treatment plus an appropriately sized reed bed and/or partial soakaway (see section 6.2.4) with high level overflow.

No significant pollution pressures

For locations where there are no significant existing or anticipated pollution pressures on the watercourse.

Dilution range

- If dilution >30:1 and <400:1, secondary treatment designed to produce effluent with a mean BOD concentration of no more than 20mg/l must normally be provided
- If dilution >10:1 and <30:1, secondary treatment designed to produce effluent with a mean ammonia concentration of no more than 5mg/l
- If dilution <10:1, enhanced treatment should be provided, the exact nature of which will vary on a case by case basis. Factors which should be taken into account will include dilution available, existing pollution pressures and likelihood of further discharges on the watercourse, proximity of Protected Areas.
 - An example of enhanced treatment is nitrifying secondary treatment plus an appropriately sized reed bed and/or partial soakaway (see section 6.2.4) with high level overflow

NOTE: The above dilutions are guidelines only and officers should use their professional judgement when determining whether a type of treatment is acceptable at a particular location.

In certain low dilution situations there may not be a drainage solution for a discharge to a watercourse. A mound soakaway or refusal may be necessary.

The mean standard that is required is determined from Table 1.

If the discharge is domestic and from a package treatment plant (PTP) then the relevant mean standard of the PTP as determined from EN12566 Part 3 needs to match or better this.

For non-domestic or non-PTP discharges, individual plant process design is needed to determine mean standards (refer to section 3.7).

Table 1 Registration look up table for sewage discharges to watercourses

Dilution range:		Treatment / standards required
Anticipated/Existing Pollution Pressure	No Anticipated/Existing Pollution Pressure	
>400:1	>400:1	Primary / Septic tank (with partial soakaway)
100:1 - 400:1	30:1 - 400:1	Secondary treatment designed to produce effluent with a mean BOD concentration $\leq 20\text{mg/l}$
30:1 - 100:1	10:1 - 30:1	Secondary: designed to produce effluent with a mean ammonia concentration $\leq 5\text{mg/l}$
<30:1	<10:1	Enhanced treatment or refuse

4.2.3 Discharges to Coastal and Transitional Waters

Discharges to tidal waters should be assessed in accordance with section 6.3.2 and the relevant guidance in *WAT-RM-13: Regulation of Microbiological Discharges*. Treatment by septic tank (with optional partial soakaway) is normally acceptable for direct discharges of registered sewage discharges to tidal waters due the large dilution available. However there may be site-specific circumstances such as where there are cumulative impacts or issues relating to the Protected Area status which require enhanced treatment.

4.2.4 Discharges to Freshwater Lochs

Discharges to freshwater lochs should be assessed in accordance with section 6.3.3.

4.3 Registering the Discharge

In order to register the discharge SEPA must be sure that

- Local environmental standards will not be breached
Refer to *WAT-SG-53: Environmental Standards for Discharges to Surface Waters*. (Compliance with local environmental standards will automatically ensure that there will be no deterioration in status)

NOTE: For discharges to watercourses, following the guidelines given in section 4.2.2 should ensure that the above criterion is met.

- For a discharge to classified waters, the water quality status is good or above.
However where the water is at less than good status (and this is due to pollution pressures) the discharge may still be registered if the additional

load is negligible or if the downgrading is due to non-sewage factors such as iron

NOTE: The discharge must not compromise the RBMP objectives.

- Connection to the public sewer should be promoted where it is reasonably practicable to do so (*WAT-RM-21*). SEPA will normally refuse an application where the site or proposed discharge point is within, or immediately adjacent to a sewered area. See section 3.3.

An overview of treatment options can be found in section 6.2.

Developments involving registration of a sewage discharge may also involve another authorisable water use activity such as a drinking water abstraction, bank reinforcement or a road crossing of a watercourse. If this is the case, the relevant authorisation must be obtained (Refer to *WAT-RM-02: Regulation of Licence-level Engineering Activities*). NOTE: Construction of the sewage outfall itself would not normally require authorisation.

Once submitted, SEPA has 30 days in which to determine a registration. During this period informal discussions may take place regarding the proposed discharge and agreement may be reached to amend the registration details. In particular, this may be done when the submitted registration details are unclear or not appropriate to protect the water environment. For example the submitted registration form may propose septic tank treatment, whereas SEPA may consider that secondary treatment is required in that particular situation. In such cases, discussions on the level of treatment must be undertaken with the applicant.

Once agreement on treatment has been reached, then the submitted registration details can be amended if necessary.

NOTE: This should be submitted in writing by the applicant for a significant change such as the type of treatment.

Escalation to a licence may be required in exceptional circumstances in order to exercise greater site-specific control via the use of licence conditions.

Where the SEPA officer requests further information [Regulation 14(1)] and considers that the discussions will extend beyond the 30 day 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 *WAT-LETT-14: Letter Requesting Further Information*). This effectively stops the determination and will only begin again once the required information has been supplied [Regulation 16(2)(b)].

SEPA Registry then forwards to the applicant the Notification of Registration (*WAT-LETT-10: Discharge Notification (Sewage)*), which contains the registration details that the discharger is legally required to comply with. 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, reedbed, etc.) to be maintained.

4.4 Upgrading in 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.
- A Notice can be served under Regulation 32 requiring specific work to be undertaken.
- A licence can be imposed under Regulation 10.

4.5 Variation of Registered Discharge Details

SEPA may vary, or the discharger may apply to vary, a discharge registration. If the details associated with a registration (such as the p.e., houses associated with the discharge etc) change, then the change of details must be submitted in writing with the appropriate fee. Refer to *WAT-RM-09: Modifications to CAR Authorisations* for further details.

5. Sewage Licence Applications

NOTE: The flowchart in *Figure 1* should have been followed prior to this stage in order to determine whether it is feasible to connect to a public sewer or to discharge to land.

5.1 Licence Applications

5.1.1 General

Sewage discharges to the water environment from a population equivalent of more than 15 (for new discharges) or 50 (for existing discharges) must be licensed by SEPA. Due to their size, these discharges are of intrinsically higher risk than registered sewage discharges.

The *CAR Licence Application Forms* are available on SEPA's website along with details of the current application fee. Sewage discharges from 15 to 100 p.e. require to pay the simple or lower licence application fee. Discharges from a p.e. in excess of 100 require to pay the complex or higher licence application fee.

For STWs serving a combined sewerage system refer to *WAT-SG-13: Municipal Sewage Treatment Works (STW)* in addition to the guidance in this document.

A responsible person must be named on the licence. The responsible person is the person specified in a licence who shall secure compliance with the terms of the licence. The responsible person can be a named individual or the body corporate.

5.1.2 Advertising

Refer to *WAT-RM-20: Advertising and Consultation* for more details.

5.1.3 Consultation

Refer to *WAT-RM-20: Advertising and Consultation* for more details.

5.1.4 Other Water Use Regimes

An assessment should be made as to whether an application is required under other water use regimes. For example the development may involve a road crossing of a watercourse, bank reinforcement or a drinking water abstraction, any of which may require incorporating in a multiple water user licence. The construction of the outfall itself may require authorising. Refer to *WAT-RM-02: Regulation of Licence-level Engineering Activities* for guidance on best practice for outfall construction and on the circumstances in which authorisation may be required.

5.2 Receiving Environments

5.2.1 Check Areas on GIS

The following areas identified on GIS should be checked -

- If the discharge is to classified waters, check whether the water quality status is good or above. If the water is not of good status due to pollution pressures and the discharge would result in further deterioration, then the licence application for an additional discharge should normally be refused. Refer to *WAT-RM-21: Allocation of Capacity and Protection of the Water Environment* and *WAT-RM-22: Managing Refusals and Appeals* for details.
However, frequently the discharge may be to unclassified waters. This may be the case for small watercourses with a catchment of <10km².
- Depending on the officer's local knowledge, it may be necessary to check GIS for other discharges in order to assess pollution pressures on the water environment. As required, other officers in the local team should be consulted to gain local information.
- Sites listed for nature conservation
A national agreement between SEPA and SNH has identified environmental standards and criteria required to protect designated sites. SEPA will undertake the SEPA Conservation test using the standardised *SEPA Nature Conservation Procedure*.
- Public Sewer Network - where 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.

5.2.2 Protected Areas

Protected Areas are given particular protection under the Water Framework Directive. They include areas designated under a number of other EU Directives as well as areas identified to protect the surface water or groundwater within them (Drinking Water Protected Areas).

- The location of the discharge relative to designated Shellfish Growing Waters and designated Bathing Waters on the GIS database should be checked. If the discharge is into, or may affect such waters, then refer to *WAT-RM-13: Regulation of Microbiological Discharges* for additional guidance.

NOTE: Direct discharges to Shellfish Growing Waters and Bathing Waters are to be avoided. If any such discharges are authorised, further treatment should be considered to reduce the microbiological content (treatment options are given in Table 1 of *WAT-RM-13: Regulation of Microbiological Discharges*). Discharges to Shellfish Waters may be allowed providing they don't impact on Shellfish Growing Waters.

- Nutrient sensitive areas designated under UWWTD and the Nitrates Directive
- Areas designated for the protection of habitats and species:
A national agreement between SEPA and SNH has identified environmental standards and criteria required to protect designated sites. SEPA will undertake the SEPA Conservation test using the standardised SEPA *Nature Conservation Procedure* .

5.3 Determining the Licence Application

It is important to realise that it is the impact on the water environment at a local scale which must be assessed rather than assessing the impact on the scale of the overall water body (the scale of which may be many kilometres).

5.3.1 For Discharges to Watercourses

For discharges to watercourses, a measured Q95 flow should be used if one is available. Where no measured low flow is available, a Q95 can be obtained by requesting a Q95 low flow estimate from SEPA Hydrology. SEPA Hydrology will use the Low Flows 2000 Enterprise software package. It should be noted, however, that the estimated Q95 flow using Low Flows 2000 Enterprise becomes significantly inaccurate for catchments of <5 square kilometres or where there may be significant abstractions / discharges to the watercourse. If additional flow data is available this can be used to decrease some potential inaccuracies. Where greater accuracy is required SEPA Hydrology should be consulted as to how this might be achieved. The discharge flow figure should be based on data in the latest version of *Flows and Loads* or for large developments *WAT-SG-13* (section 3.1).

NOTE: These rules do not apply where the discharge is into stretches of watercourses which are not classified, but where there are known serious pollution pressures. Such discharges will require more detailed consideration and alternative treatment conditions may be required.

For classified watercourses, discharges into areas of less than good status may be refused.

The location of the outfall pipe in the watercourse should be considered so as to ensure efficient mixing and, for primary discharges, to avoid the appearance of a visible plume of effluent downstream.

Augmenting River Flow to Provide Increased Dilution

Note: Where there is limited dilution SEPA will consider applications for new or modified abstractions or impoundment activities for the purpose of providing extra dilution for a point source discharge to allow further

development. This would have the effect of augmenting the natural Q95 and Mean Daily Flow (MDF). For example, the compensation flow from an impounded reservoir could be increased to provide further dilution for a downstream discharge.

- SEPA will apply the relevant environmental assessments and standards to such applications as it would for any other and, where appropriate, specify or vary the abstraction or impoundment licence conditions accordingly.
- This approach could be taken for water resource activities and point source discharges which are part of the same site or process (and therefore operated by the same responsible person), e.g. a freshwater fish farm or distillery.
- This approach may also be considered for separate sites situated any distance apart and operated by different parties. However in this case it will be necessary to set conditions to reflect the fact that the operation of one activity is dependant on the operation of another (e.g. alternative discharge limits for high and low flows). Alternatively, a management agreement between the parties may be required. Any such arrangement should be entered into with caution due to the complications which could arise if one of the activities were to cease. Further advice on how to progress such a situation may be required in which case officers should contact the WFD helpdesk and/or seek legal advice.

>400:1 Dilution

For information on whether sampling is required refer to the guidance on compliance monitoring (*DRM-G-006*).

If >400:1 dilution then primary treatment by a septic tank would normally be acceptable (see section 6.2.1). However a partial soakaway would normally be required (see section 6.2.4).

<400:1 Dilution (for unsampled discharges i.e. <200 p.e.)

If <400:1 dilution then secondary treatment would normally be required.

Significant Pollution Pressures

For locations where there are significant existing or anticipated pollution pressures on the watercourse.

- If dilution >200:1 and <400:1, secondary treatment designed to produce effluent with a mean BOD concentration of no more than 20mg/l, as described in section 7.2,
- If dilution <200:1, then the discharge is of higher risk and modelling should normally be undertaken as described below.

No Significant Pollution Pressures

For locations where there are no significant existing or anticipated pollution pressures on the watercourse, less strict dilution requirements apply.

- If dilution >100:1 and <400:1, secondary treatment designed to produce effluent with a mean BOD concentration of no more than 20mg/l, as described in section 7.2,
- If dilution <100:1, then the discharge is of higher risk and modelling should normally be undertaken

Where modelling is required a Monte Carlo combined distribution calculation should be undertaken as described in *WAT-SG-02: Modelling Continuous Discharges to Rivers*. (Refer to the *Monte-Carlo Mass Balance* guidance and tool). The document *WAT-RM-21: Allocation of Capacity and Protection of the Water Environment* may also need to be referred to.

Enhanced treatment producing higher quality effluent may be required. The use of a partial soakaway is especially important if the dilution is particularly low. The exact nature of the enhanced treatment depends on the particular circumstances of the discharge, such as the dilution, size of discharge, existing pressures on watercourse, other potential developments and proximity of Protected Areas.

In certain low dilution situations there may not be a drainage solution for a discharge to a watercourse. A mound soakaway or refusal may be necessary.

Table 2 Licence look up table for unsampled sewage discharges to watercourses

Dilution range:		Treatment / standards required
Anticipated/Existing Pollution Pressure	No Anticipated/Existing Pollution Pressure	
>400:1	>400:1	Primary / Septic tank (with partial soakaway)
200:1 - 400:1	100:1 - 400:1	Secondary treatment designed to produce effluent with a mean BOD concentration $\leq 20\text{mg/l}$
<200:1	<100:1	Site-specific standards (MC model)

NOTE: The above dilutions are guidelines only and officers should use their professional judgement when determining whether a type of treatment is acceptable at a particular location.

The mean standard that is required is determined from Table 2.

If the discharge is ≤ 50 pe domestic and from a package treatment plant (PTP) then the relevant mean standard of the PTP as determined from EN12566 Part 3 needs to match or better this.

For treatment systems not certified to EN12566 Part 3 (>50pe domestic, non-domestic or non-PTP discharges) individual plant process design is needed to determine mean standards (refer to sections 3.7 and 7.2.1).

5.3.2 Discharges to Coastal and Transitional Waters

These should be assessed in accordance with the details in section 6.3.2 and *WAT-RM-13: Regulation of Microbiological Discharges*.

5.3.3 Discharges to Freshwater Lochs/Canals

These should be assessed in accordance with section 6.3.3.

5.3.4 Licensing the Discharge

Licence conditions must be set so that:

- Local environmental standards will not be breached
The guidance document *WAT-RM-21: Allocation of Capacity and Protection of the Water Environment* should be followed. Also refer to *WAT-SG-53: Environmental Standards for Discharges to Surface Waters*. Compliance with local environmental standards will automatically ensure that there will be no deterioration in status.
NOTE: For discharges to watercourses, following the guidelines given in section 5.3.1 should ensure that the above criterion is met.

NOTE: Deterioration from high to good status can only be permitted in certain circumstances. Refer to *WAT-RM-22: Managing Refusals and Appeals*.

- Connection to the public sewer should be promoted where it is reasonably practicable to do so (*WAT-RM-21*). SEPA will normally refuse an application where the site or proposed discharge point is within, or immediately adjacent to a sewered area. See section 3.3.
- An overview of treatment options can be found in section 6.2.

Developments involving licensing of a sewage discharge may also involve another authorisable water use activity such as a drinking water abstraction, bank reinforcement or a road crossing of a watercourse. If this is the case, the relevant authorisation must be obtained (Refer to *WAT-RM-02: Regulation of Licence-level Engineering Activities*). NOTE: Construction of the sewage outfall itself would not normally require authorisation if the outfall design adheres to best practice (i.e. as described in *WAT-SG-28: Good Practice Guide - Intakes & Outfalls*).

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 *WAT-LETT-14: Letter Requesting Further Information*). 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)].

In order to assist other SEPA officers who may in the future deal with queries relating to the licence conditions, details of how any non-standard licence conditions were determined must be recorded on the Document Approval Form (DAF) in the box titled 'Details of non-standard conditions not already covered in an appropriate decision document or RRT paper' and placed in the working file. This is particularly important for numeric licence conditions and information used in the determination such as flows and p.e. should be recorded. 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*.

5.4 Municipal STWs

STWs receiving effluents from a combined sewerage system are generally more complex and a separate licence template exists *WAT-TEMP-06: Municipal Sewage Treatment Works Licence Template*.

Refer to *WAT-SG-13: Municipal Sewage Treatment Works (STW)* for additional guidance. This document includes guidance on flow monitoring, overflow settings and the use of instantaneous and composite standards for UWWTD qualifying discharges.

5.5 Upgrading in Treatment for Existing Licensed Discharges

There may be occasions when a licensed 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 licence conditions to require improved treatment. This can be appealed against.

- A Notice can be served under Regulation 32 requiring specific work to be undertaken.

5.6 Variation of Licence Conditions

SEPA may vary or the operator may apply to vary a licence. Variations may be administrative variations (i.e. with no environmental implications) or technical variations. Refer to *WAT-RM-09: Modifications to CAR Authorisations* for guidance.

6. Determining Appropriate Treatment

6.1 Environmental Drivers

SEPA will be expected to provide discharge criteria in order to ensure that the appropriate level of treatment is provided to ensure delivery of environmental protection. The following issues should be considered when discussing treatment provision with dischargers.

The key environmental drivers must be identified as they will influence the level of treatment required. The drivers vary according to the receiving waters:

- Rivers and lochs – reduction in BOD & ammonia load (compliance with Environmental Standards)
- Rivers and lochs – reduction in phosphorus load in areas sensitive to eutrophication (compliance with Environmental Standards)
- Lochs – reduction in microbiological load to designated Bathing Waters (compliance with Environmental Standards and minimise aesthetic impact and health risk)
- Tidal waters – reduction in microbiological loads (compliance with Bathing Waters and Shellfish Waters standards) (see *WAT-RM-13: Regulation of Microbiological Discharges*)

For example, where the priority driver is the reduction of bacterial load, waste stabilisation ponds and wetlands may provide the most effective form of treatment by providing high retention periods and natural ultraviolet disinfection.

Practical constraints mean that SEPA will not normally require phosphorus removal or microbiological disinfection for discharges of less than 100 p.e., but the treatment process best suited to the environmental driver should be stipulated as a licence condition.

- Conservation Area Impact Assessment
A national agreement between SEPA and SNH has identified environmental standards and criteria required to protect designated sites. SEPA will undertake the SEPA Conservation test using the standardised SEPA *Nature Conservation Procedure*.

6.2 Treatment Options

6.2.1 Septic tanks

Septic tanks provide an effective form of primary treatment for sewage effluent by removing solids. However the resultant supernatant discharged from the septic tank can be highly polluting.

Inappropriately designed or sited septic tank discharges may cause local nuisance and the discharges have potential to be unsightly, cause odour problems and represent a risk to health and the environment.

The cumulative effects of septic tanks may cause pollution problems in small watercourses and can threaten microbiological standards in Bathing and Shellfish Waters as set by the Bathing Waters Directive and Shellfish Waters Directives.

The direct discharge of septic tank effluent to surface waters is to be discouraged, as SEPA would expect connection to sewer or where the grounds conditions are suitable discharge to land. A septic tank may be considered in circumstances when criteria such as the following apply:

- Additional mitigation is proposed, e.g. the provision of a partial soakaway where ground conditions allow (see section 6.2.4).
- There is very high dilution available in the receiving waters (to the order of >400:1 dilution at 95%ile river flows) unless the watercourse is already impacted by organic effluents, e.g. in a constrained area
- No other use or value will be compromised, including aesthetics or amenity.

Useful reference sources include:

- *PPG 4 Treatment and disposal of sewage where no foul sewer is available*
- *Technical Handbook: Section 3: Environment*
- *WAT-SG-53: Environmental Standards for Discharges to Surface Waters*

6.2.2 Secondary Treatment

Where a septic tank discharge may cause an unacceptable impact, it is possible to reduce this by providing secondary treatment in the form of wetlands, reedbeds or package/mechanical treatment plants.

Package sewage treatment plant (PTP) may include biological filters (BFs), rotating biological contactors (RBCs), biological aerated filters (BAFs), activated sludge plants (ASPs), sequencing batch reactors (SBRs).

The maintenance of PTPs can pose serious difficulties for discharges from domestic properties or small trade premises. Consequently, SEPA will encourage the use of passive forms of treatment such as constructed wetlands and reedbeds (see *Good Building Guide 42 - Reed beds*). These forms of treatment are also considered more sustainable as power is not usually required for their operation. Reedbeds can be used as secondary treatment for septic tank (primary) effluent or for tertiary treatment of secondary effluent. Horizontal-flow beds are used principally to remove BOD and SS, whereas vertical-flow beds can also remove ammonia due to the

better oxygen transfer achieved. The use of an impermeable liner for reedbed/wetland treatment systems should be considered in permeable soils.

6.2.3 Tertiary Treatment

Tertiary treatment of secondary treated effluent can include biological treatment to oxidise ammonia, disinfection plant or filtration plant (such as sand filters, drum filters and membrane systems) to remove fine suspended solids. Nutrient removal from effluents can also be achieved, for instance by using chemical dosing to remove phosphorous by precipitation.

6.2.4 Partial or Seasonal Soakaway

This is a hybrid option incorporating an overflow to a watercourse/loch from the highest point of the soakaway, providing the optimum disposal solution for sites where there is:

- A high water table in winter and low surface water flows in summer, or
- A large flux in discharge volumes and insufficient soakaway area to cope with peak volumes.

The overflow should only operate when there is adequate dilution. Therefore, for discharges to watercourses, a good understanding of flow characteristics in the receiving watercourse is required, from local knowledge or hydrometric studies.

The most common form of soakaway is either a gravel-filled soakage pit or sub-surface irrigation system, comprising of a herringbone pattern of land drains laid in shallow, gravel-filled trenches. Slotted corrugated piping is not appropriate for use within a soakaway system given the potential for blockages to occur. Perforated piping or traditional clay field tiles is preferred. Pipework should not be continuous across the soakaway to prevent short circuiting of effluent flows from inlet to outlet.

The size of the required partial soakaway is site specific and relates to the size of the discharge and the sensitivity of the receiving waters. Clearly there will be situations where the size of the partial soakaway will be restricted due to the area of land available and its topography. However the size of the partial soakaway should normally be a minimum of 25 square metres per house and could be considerably more than this in certain situations. (25 square metres typically provides 2 days storage of sewage effluent from a house)

If the licence has numeric conditions relating to effluent quality, these should apply at a sample point before the partial soakaway. If the conditions applied after the partial soakaway then the impact of poor maintenance on the effluent quality would be masked by the partial soakaway itself, with a result that enforcement action would be more difficult.

6.2.5 Field Drains

Field drains (underground pipe or tiles used for draining fields) are generally suitable as a conveyance system and their use can have significant advantages in that in dry weather sewage effluent infiltrates to the ground. If the licence has numeric conditions relating to effluent quality, these should apply at a sample point before the field drain.

6.2.6 Typical Effluent Characteristics

For details of typical effluent characteristics from various treatment options refer to *WAT-SG-05: Point Source Discharge Constituents*.

6.3 Assessing Impact of the Discharge

6.3.1 Discharge to Watercourse

Assessment of the impact can be made by simply using the dilution available or by modelling, details of which are described in section 4.2.2 (for registrations) and section 5.3.1 (for licences). Guidance on modelling can be found in *WAT-SG-02: Modelling Continuous Discharges to Rivers*.

Monte Carlo modelling should always be undertaken rather than simple mass balance modelling. The outputs from Monte Carlo modelling include a mean standard and a 95%ile figure (which if required, should be multiplied by a factor in order to obtain the upper tier standard).

6.3.2 Discharge to Coastal and Transitional Waters

Particular consideration needs to be made as to the impact on designated Bathing Waters and Shellfish Waters.

NOTE: Direct discharges to Bathing and Shellfish Harvesting Waters are to be avoided. If any such discharges are authorised, consideration should be made of using reed bed treatment and/or partial soakaway to reduce the microbiological content. Refer to *WAT-RM-13: Regulation of Microbiological Discharges* and *WAT-SG-11: Modelling Coastal and Transitional Discharges* for further guidance.

The outfall should normally have the top of the pipe (soffit) located below Mean Low Water Spring (MLWS) to aid dispersion etc. But there may be situations where MLWS is a large distance across mudflats e.g. as is frequently the case in estuaries. In this case it may not be reasonable to require the construction of an outfall below MLWS, especially for a small discharge. Similar cost/benefit considerations should apply for outfalls constructed in other difficult situations such as across a very rocky shore.

The outfall should have protection against erosion of the underlying sand so as to prevent movement of the outfall pipe and premature leakage of effluent at a point above MLWS.

NOTE: Engineering works below Mean High Water Spring (MHWS) such as the construction of the outfall itself may require a licence from *Marine Scotland*.

6.3.3 Discharge to Freshwater Lochs/Canals

There is a strong presumption against a discharge to a freshwater loch and should only be agreed if all other options have been demonstrated to be impractical. Refer to *WAT-RM-37: Regulation of Phosphorus Discharges to Freshwater Lochs*. However if a continuous discharge to a freshwater loch is the only viable option, the presumption is for secondary treatment with a partial soakaway. Furthermore, in certain circumstances (e.g. Protected Areas status, areas subject to a catchment plan) SEPA may require more stringent treatment for reduction of phosphorous.

There is a similar presumption against a sewage discharge direct to a canal. The discharger should be advised to contact *Scottish Canals* at an early stage, as they would not normally allow a sewage discharge to a canal.

In order to determine whether the proposed discharge may exceed an environmental quality standard in the receiving loch, modelling may be required. Details of this can be found in *WAT-RM-37: Regulation of Phosphorus Discharges to Freshwater Lochs*.

There is also a presumption against authorising sewage discharges from vessels in freshwater lochs (and also in rivers and canals).

7. Licence Conditions

The following licence templates should be used:

- *WAT-TEMP-04: Septic Tank Licence Template*
- *WAT-TEMP-05: Separate Sewage System Licence Template*
- *WAT-TEMP-06: Municipal Sewage Treatment Works Licence Template*

For more detailed guidance on licence conditions for Municipal STWs serving refer to *WAT-SG-13: Municipal Sewage Treatment Works (STW)*.

7.1 Descriptive Effluent Quality Conditions

Descriptive conditions describe the quality or impact of the effluent and are used in place of numeric limits when the risk of environmental impact is low. Although licences with no numeric limits are generally excluded from routine monitoring plans, periodic inspections may be required to ensure there is no chronic environmental impact. If routine sampling is warranted then a descriptive licence is inappropriate and two tier numeric limits must be derived.

Descriptive conditions should be used for unsampled discharges from septic tanks.

A descriptive condition must not be included with a numeric standard regulating the same determinand. For example, the descriptive oil condition “shall not include significant traces of visible oil or grease” must not be included with a numeric standard for hydrocarbon oil.

Conditions to prevent growth of sewage fungus downstream, smothering of the stream bed, foaming and visible effluent plumes should be included if there are no sanitary determinands.

Descriptive conditions should also be included to support enforcement action in the event of effluent quality deteriorating due to poor maintenance, plant breakdown or hydraulic overload.

7.2 Numeric Effluent Quality Conditions

Inadequate maintenance is one of the major causes of problems with small STWs. In order to facilitate enforcement in the event of poor maintenance, a default standard should be applied to licences for sampled discharges including descriptive licences as follows:

- 100 mg/l absolute upper tier suspended solids for all secondary treated discharges.

7.2.1 Mean Design Standards for unsampled discharges

If descriptive conditions are not appropriate, numeric standards must be used and a mean design standard should be used for discharges that will not be routinely sampled. (For secondary treated discharges from package treatment plants serving domestic premises $\leq 50pe$, this would be the mean standard as certified by testing to EN12566 Part 3 – refer to section 3.7).

Monte Carlo modelling produces two-tier limits and a mean. For unsampled discharges the mean should be used in the licence.

EN12566 Part 3 only applies to package treatment plants serving domestic premises up to and including 50pe. Refer to section 3.7 for other situations.

7.2.2 Two-Tier Numeric Standards for sampled discharges

Numeric two-tier effluent quality standards are used for **discharges which require sampling** to ensure that the discharge remains compliant and that downstream uses and water quality are not compromised. Limits are set as two-tier standards: a 95thile lower tier and a 99, or higher, percentile as upper tier, to enable compliance assessment.

The multipliers between lower-tier and upper-tier vary according to the value of the lower-tier standard. The multipliers are larger where lower-tier standards are more stringent. This is consistent with the approach used in England and Wales. The lookup multiplier tables are provided in *Two-tier Multiplier Tables*.

These multipliers define standards which protect the environment as required by CAR.

A 100 mg/l absolute upper tier suspended solids limit for all secondary treated discharges must be applied.

There may be a limited number of circumstances where two-tier suspended solids standards may be appropriate. These may include slow deep rivers and some SACs where the designated species would be sensitive to suspended solids.

Septic tanks, designed in accordance with BS EN 12566-1:2000 and adequately maintained, should be capable of achieving 100/250 mg/l 2-tier standards for suspended solids. Where it is clear there will be no significant adverse impact due to, for example, large dilution, a more relaxed suspended solids limit can be used (e.g. an upper-tier limit of 250 mg/l suspended solids). A more relaxed limit is appropriate for septic tanks serving existing combined sewerage systems.

7.2.3 BOD and Ammonia Standards

These standards determine the secondary treatment works performance requirements in order to achieve environmental quality standards and maintain or improve the receiving waters classification.

7.2.4 Phosphorus Standards

Phosphorus standards may be required, depending on available dilution and environmental sensitivity. Phosphorus should be controlled by including soluble reactive phosphorus (SRP) or total phosphorus (TP) limits in the licence. Further guidance is provided in section 6 of *WAT-SG-13: Municipal Sewage Treatment Works (STW)*. The WFD environmental standards refer to levels of SRP in watercourses and TP in freshwater lochs.

7.2.5 Priority, Dangerous Substances or Specific Pollutants

All discharges **liable to contain** Priority, Dangerous Substances or Specific Pollutants must have numeric or descriptive limits depending on the level of environmental risk. Refer to *Policy 61: Control of priority and dangerous substances and specific pollutants in the water environment* and *WAT-SG-79: Priority Hazardous Substances Licence Reviews - Guidance* for more guidance.

When adding or changing a Priority Hazardous Substance or a Dangerous Substance Directive list 1 substance to a site licence, NEMS and CLAS will need to be updated to reflect the reporting requirements of these Directives.

Both NEMS and CLAS will need to be updated to capture the correct information to allow the correct monitoring to be planned and carried out. NEMS and CLAS guidance relating to updating the systems are available (User Manual and Guide, NEMS User Manual Chemistry and CAR on CLAS), as well as Superusers and User Groups who can be contacted.

7.2.6 Suspended solids

All sampled sewage and organic trade effluent discharges **subject to secondary/tertiary treatment** should have a suspended solids standard of 100mg/l expressed as an upper-tier limit. (No exceedences of this limit are permitted i.e. not a single tier limit where exceedences permitted, as detailed in *WAT-RM-40: Assessment of Numeric Discharge Quality Conditions*).

The suspended solids standard should be routinely monitored and compliance assessment undertaken where instantaneous samples are taken. Where composite samples only are taken, the instantaneous suspended solids limit will not be used for routine monitoring and will be used for enforcement purposes only.

Discharges, subject to sampling, from primary settlement or septic tank treatment require two-tier suspended solid conditions (see section 7.2.2).

7.2.7 pH Standards

pH standards should be included where there is a likelihood of pH fluctuations, e.g. known trade effluent inputs or tertiary treatment which may affect pH. The pH range must be set on a site specific basis. The range 5 to 9 is appropriate for discharges to freshwater with a wider range for saline waters, for example 4 to 10.

7.2.8 Hydrocarbon Oil

Numeric limits are only required in circumstances where a significant chronic risk exists which will require chemical monitoring. Otherwise the descriptive condition in Schedule 3 for “no significant impact on the receiving waters due to the presence of oil and/or grease” should be used.

7.3 General Conditions

7.3.1 Maintenance

Conditions requiring operation and maintenance of the treatment facility in accordance with the manufacturer’s instructions and provision of a record of maintenance for inspection by SEPA, on request, should be included in descriptive 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 licences should include a condition requiring the provision of a visual or audible alarm system to notify of plant breakdown or power failure.

7.3.2 Flow Monitoring

Flow monitoring is not normally required for discharges of sewage effluent from septic tanks or small STW. Where justified, conditions specifying the maximum daily flow and/or instantaneous flow rate and provision of appropriate flow monitoring/recording equipment can be included. Flow recording equipment can be costly and should only be required in exceptional circumstances. Readings from a water supply flow meter could be used in place of a flow meter on the discharge.

7.3.3 Sampling Points

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, would normally be immediately after the treatment system. This ensures that the effluent produced by the septic tank or other treatment system is of the required quality. If the numeric conditions applied after a partial soakaway, the effects of a poorly maintained system would be masked by the partial soakaway itself and enforcement action could be compromised.

Details of a sampling chamber allowing easy access into the manhole to sample using a container can be found in the *Technical Handbook*: 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.

7.4 Other Considerations

7.4.1 Ownership / Discharges from Multiple Dwellings

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, monitoring and enforcement by SEPA is simpler and the shared treatment facility is cheaper to install for the discharger. For licensed discharges, the 'responsible person' is responsible for ensuring compliance with the licence conditions.

For sewage registrations a single treatment system is also preferred. Should a registered sewage discharge require enforcement action, measures such as serving an enforcement notice on all operators (i.e. all householders discharging) or escalation to a licence can be taken.

(This contrasts with the previous position SEPA took under COPA where individual systems were preferred due to concerns regarding enforcement).

For further information, refer to *WAT-PS-06-01: Multiple Ownership Operators - Authorising Existing and New Activities*.

7.4.2 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.

7.4.3 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. 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 the latest version of *Flows and Loads*.

7.4.4 Flow Variations at Package Treatment Plants

Flow variations affecting effluent quality may occur due to:

- Seasonal factors or
- 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 reseeded 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.

7.4.5 Connection to the Public Sewer

Where appropriate, reference should be made to *WAT-PS-06-08: Policy and Supporting Guidance on Provision of Waste Water Drainage in Settlements* which sets out SEPA's policy principles on the provision of waste water.

References

Key References

- *WAT-RM-02: Regulation of Licence-level Engineering Activities*
- *WAT-RM-04: Regulation of Indirect Sewage Discharges to Groundwater*
- *WAT-RM-09: Modifications to CAR Authorisations*
- *WAT-RM-13: Regulation of Microbiological Discharges*
- *WAT-RM-20: Advertising and Consultation*
- *WAT-RM-21: Allocation of Capacity and Protection of the Water Environment*
- *WAT-RM-22: Managing Refusals and Appeals*
- *WAT-RM-37: Regulation of Phosphorus Discharges to Freshwater Lochs*
- *WAT-RM-40: Assessment of Numeric Discharge Quality Conditions (for CAR, UWWTD, IPC and PPC Compliance) [Ex-Compliance Assessment Scheme]*
- *WAT-SG-02: Modelling Continuous Discharges to Rivers*
- *WAT-SG-05: Point Source Discharge Constituents*
- *WAT-SG-11: Modelling Coastal and Transitional Discharges*
- *WAT-SG-13: Municipal Sewage Treatment Works (STW)*
- *WAT-SG-28: Good Practice Guide - Intakes & Outfalls*
- *WAT-SG-53: Environmental Standards for Discharges to Surface Waters*
- *WAT-SG-79: Priority Hazardous Substances Licence Reviews - Guidance*

Policy Statements

- *WAT-PS-06-01: Multiple Ownership Operators - Authorising Existing and New Activities*
- *WAT-PS-06-08: Policy and Supporting Guidance on Provision of Waste Water Drainage in Settlements*
- *WAT-PS-08-01: Untreated Sewage Discharges*

Letters and Templates

- *WAT-LETT-10: Discharge Notification (Sewage)*
- *WAT-LETT-14: Letter Requesting Further Information*
- *WAT-TEMP-04: Septic Tank Licence Template*

- *WAT-TEMP-05: Separate Sewage System Licence Template*
- *WAT-TEMP-06: Municipal Sewage Treatment Works Licence Template*

Other Documents

- *CAR Application Forms* including Guidance for Applicants (www.sepa.org.uk)
- *DREAM* (Dynamic Regulatory Effort Assessment Model) SEPA Intranet
- *Monte-Carlo Mass Balance* guidance and tool, SEPA Informatics Hub
- *Nature Conservation Procedure* SEPA Intranet
- *DRM-G-006 DREAM Hazard and Risk Assessment Guidance: Compliance Monitoring* (Inspection, Sampling & Data Returns)
- *OPTIC Inspections* SEPA Intranet
- *PPG 4 Treatment and disposal of sewage where no foul sewer is available* NetRegs (www.netregs.org.uk)
- *Policy 61: Control of priority and dangerous substances and specific pollutants in the water environment* SEPA (www.sepa.org.uk)
- *Two-tier Multiplier Tables* SEPA Intranet

External Links

- *Flows and Loads* British Water Code of Practice (www.britishwater.co.uk/)
- *Good Building Guide 42: Reed beds* ID321453 (www.brebookshop.com)
- *Marine Scotland* (www.scotland.gov.uk/)
- *Scottish Canals* (www.scottishcanals.co.uk)
- *Technical Handbook: Section 3: Environment* (www.scotland.gov.uk/)
- EN 12566 Part 3: Small wastewater treatment systems for up to 50 PT. Packaged and/or site assembled domestic wastewater treatment plants

- End of Document -