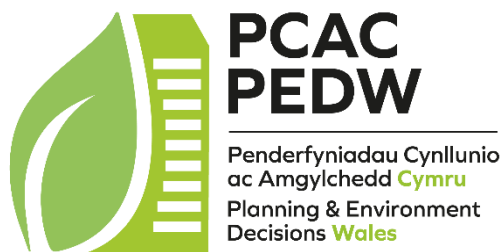


Water Related Planning Casework



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New chapter.	

Key legislation and policy

Primary Legislation	<p>Environmental Protection Act 1990 Water Resources Act 1991 Water Industry Act 1991 Environment Act 1995 Pollution Prevention and Control Act 1999 Water Act 2003 Flood and Water Management Act 2010</p>
Secondary Legislation	<p>Water Supply (Water Quality) Regulations 2016 Private Water Supplies (Wales) Regulations 2017 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 Contaminated Land (Wales) Regulations 2006 Environmental Permitting (England and Wales) Regulations 2016 Flood Risk Regulations 2009</p>
National policy and guidance	<ul style="list-style-type: none"> • Planning Policy Wales (PPW10) • TAN15: Development and Flood Risk • Water Strategy for Wales 2015 • Environment Strategy for Wales 2006 • Environmental Permitting Guidance – Water Discharge Activities: December 2010 (Defra and WAG) • WG Circular 008/2018, Planning requirement in respect of the use of private sewerage in new development, incorporating septic tanks and small sewage treatment plants • Water Framework Directive Implementation in England and Wales: new and updated standards to protect the water environment – May 2014 (Defra and WAG)

Judgments	<ul style="list-style-type: none"> • None
Other guidance	<ul style="list-style-type: none"> • Ministerial Decisions 2156953 (Burry Port) and 2206500 (Ammanford) – both re. flood risk. • NRW has a range of internal and external guidance documents which may be referred to in their submissions.

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Introduction

1. This guide gives advice on issues relating to water supply, sewerage, sewage treatment and disposal, flooding and the prevention of pollution of surface and underground waters, as they may arise in general planning casework. This guide is intended to assist Inspectors who may not be fully aware of water policy and the terms used.
2. The statutory water and sewerage undertakers in Wales deal with water supply and sewerage within their statutory areas. Natural Resources Wales (NRW) are responsible for policing and protecting the quality of inland, coastal and underground waters, for conserving and enhancing water resources, for licensing water abstractions and for consenting effluent discharges. They are also very much concerned with the prevention of flooding and have statutory powers to manage flood risk to existing properties and assets, whether this is

from the sea or from rivers. NRW has responsibilities for 'main rivers' (watercourses designated as such on main river maps), whilst local authorities have responsibilities for non-main river watercourses, and Internal Drainage Boards (IDBs) are responsible for draining certain low-lying areas. Responsibility for dealing with surface water run-off from highways and from other hard-surfaced development varies from location to location; sewerage undertakers, local planning and highway authorities and NRW may all be involved.

3. The principal function of The Water Services Regulation Authority (OFWAT) is to regulate the financial affairs of the statutory water and sewerage undertakers in England and Wales. As part of that duty, OFWAT carries out a Periodic Review every five years when all water and sewerage undertakers have to submit their Asset Management Plans (AMPs) for approval. OFWAT sets the price limits ('K factors') that Companies can charge, but at a level that is intended to allow for their approved commitments, including all identified new schemes. Particularly on proposals for larger developments, it is sometimes stated that no money has been allocated for the necessary works in the current AMP determination. However, additional 'pass-through' funding may be authorised by OFWAT if the company can demonstrate that there are stringent planning requirements for a scheme. The company may need to make an appeal if it is to demonstrate that these requirements are met.
4. NRW's policies on such things as groundwater protection or drainage may be referred to in appeals. These are national policy documents. Some have been subject to some form of public consultation, but many have not or are in draft form. In planning casework they are most unlikely to carry the same weight as Development Plan policies. Inspectors need to be aware that NRW has its own Guidance for Pollution Prevention (GPP) documents (formerly known as Pollution Prevention Guidelines (PPGs)).
5. NRW also has a range of regional strategies and management plans (e.g. Coastal Management Plans, Catchment Abstraction Strategies) that look many years ahead. Whilst policies in these various documents do not have the same weight as those in the statutory Development Plan, in most cases they have been subject to at least some public consultation process and can be given appropriate weight in reaching a decision.

Water Supply

6. In Wales water is supplied by the statutory undertakers: Dŵr Cymru Welsh Water and Severn Trent Water (which also provide sewerage and sewage disposal services); or by Hafren Dyfrdwy, a water-only company which supplies the Wrexham and Chester areas in the River Dee catchment. Formerly known as Dee Valley Water, the company was taken over by Severn Trent Water in 2018. There are also a considerable number of Private Water Supplies where a private individual or firm operates their own water source, e.g. an abstraction from a river, well or borehole.

7. A supply of potable (drinkable) quality water is available from the mains of the statutory water undertaker for the area, and under Section 45 of the Water Industry Act 1991 (WIA), the owner or occupier of a building can requisition a domestic water supply connection if a suitable water main exists. If a private water supply is to be provided, the Local Authority is obliged by the WIA to satisfy itself as to the wholesomeness and sufficiency of the water. The Water Supply (Water Quality) Regulations 2000 prescribe the standards of wholesomeness for water supplied for domestic and food production purposes, and private water supplies are regulated by the Private Water Supplies (Wales) Regulations 2017.
8. The provision of a water supply should be taken into account in any major development arising through the Development Plan process. However, acting on advice from the Water Undertakers, Local Planning Authorities have occasionally placed embargoes on unplanned development because of a lack of suitable public water supplies. Possible reasons for this may include the distance to public water mains, or inadequacies in capacity of the source works, the water treatment works, service reservoirs, pumping installations or water mains. Inspectors should be aware however that a main can be requisitioned under S41 of the WIA, subject to a financial contribution if the scheme would incur a deficit. If major works are required, the cost could be prohibitive for a small development, and a good quality private water supply may overcome the problem. If the water supply is in dispute, it will be necessary to have regard to the obligations placed on the Local Authority and the Water Undertaker by the WIA, and possibly also by other legislation.
9. A licence is required to abstract water from above or below ground (except for very small quantities, such as the supply for one house). NRW manages the overall water resources for Wales and determines licence applications under the terms of the Water Resources Act 1991 as amended by the Water Act 2003.
10. Water Undertakers have a duty to promote the efficient use of water, and they now produce Water Efficiency Plans. Among other things, they encourage the use of water saving and recycling schemes both in industry and in the home. Such schemes can show considerable financial benefits for some industrial users, whilst water metering, the installation of water saving appliances and the recycling of greywater or rainwater are also becoming common in new residential schemes. Recycled water may need treatment, even though it is usually only to be reused for such purposes as flushing toilets or garden watering, and Inspectors should be satisfied that sound operation and maintenance procedures will be provided.

Sewerage

11. Sewerage is the transfer of wastewater by sewers, which may be pipes or open channels. 'Drain' and 'sewer' are defined in S219(1) of the WIA. To all intents and purposes, a single curtilage is served by a drain, whereas a sewer collects the drainage from more than one curtilage. Surface water sewers, or storm sewers, collect and convey rainwater. Foul sewers convey domestic sewage

and wastewater, together with trade effluents, for treatment at waste water treatment works (WWTWs). Modern sewerage employs 'separate' systems, so that surface water from roofs and paved areas is excluded from the foul flows conveyed for treatment. Older systems were generally 'combined', and any sewer may suffer infiltration by groundwater.

12. Storm sewage is taken to be that amount of wastewater which, as a result of rain, snowmelt or infiltration, is over and above the normal daily dry weather levels expected in the system. Combined sewer overflows (CSOs) are used to relieve the sewerage system of excessive flows in wet weather and are designed to discharge to streams/rivers, or the sea/estuaries. These discharges are regulated by consents or environmental permits, issued by NRW. However, frequent overflows (or breaches of the consent/permit conditions) may indicate that the sewerage system is more commonly overloaded and cannot satisfactorily accept any further connections.
13. Each sewerage undertaker (in Wales Dŵr Cymru Welsh Water and Severn Trent Water) has a duty to provide an effective system of sewers in its area, and these sewers become public sewers to which the owners/occupiers of premises, and the owners of private sewers, have a right to connect (except trade effluent discharges which require the undertaker's consent). Owners/occupiers may also requisition a sewer or, in circumstances where environmental problems would otherwise arise, the undertaker may be obliged to provide one.
14. A sewerage undertaker cannot refuse to allow connection, or dictate where such a connection should be made, on the grounds that some part of the sewerage system is overloaded (see *Barratt Homes Ltd v Dŵr Cymru Cyfngedig*). However, planning permission can be refused on the basis that the existing sewerage system is unable to cope with the wastewater flows likely to be generated by the proposed development. This may be because of limitations in the size of the pipes, in the flow rating of pumping stations, or in the capacity of the WWTW that is served by the system.
15. Careful consideration should be given to permitting any development that would drain to a public sewer in situations where there is clear evidence to show that the sewerage system is overloaded, or where policies indicate that the limited capacity which remains is reserved for essential development. In themselves, decisions to allow small developments might have little impact on the quality and frequency of discharges from the system, but accumulatively such decisions can have significant effects.
16. The sewerage undertaker may have long term plans for works to improve the system, but priorities change and the works themselves may take a long time to complete. A condition to the effect that development should not be occupied until such works have been carried out should only be attached if there is a firm indication that the works are likely to go ahead in the foreseeable future. Inclusion of a project in the water company's AMP may provide the necessary reassurance, but a signed contract is better. Certainly, Inspectors should be cautious of any arrangement whereby newly constructed housing would be left

vacant pending completion of the improvements. An agreement (S106 TCPA) between the developer and the undertaker might overcome the difficulty. Alternatively, planning permission might be subject to a planning condition that development should not begin until the undertaker's scheme is complete; in such a case, consideration should be given to the likelihood of the scheme being carried out within a certain timescale and to the potential consequences that might arise if this did not happen.

17. In circumstances where the undertaker is unable to provide sufficient sewerage or sewage treatment capacity to serve a proposed development, the developer might suggest use of a private package treatment plant; in such cases NRW's view of the proposals would be an important consideration. If the package plant is to remain in single ownership, it is reasonably likely that the quality and quantity of effluent from it can be effectively regulated by NRW. However, if ownership is to be shared amongst occupiers of a housing development, for example, it is difficult for NRW to enforce the conditions of the discharge consent, and proper maintenance and operation of the plant cannot be assured. If a joint management company is proposed, there should be specific and legally binding arrangements in place to ensure effective control of the plant before permission for the development is granted.

Sewage Treatment and Disposal

18. All foul sewage needs an appropriate disposal system, and it is WG policy that any development discharging domestic sewage should connect to the public sewerage system unless it is not feasible to do so (PPW10 paragraph 6.6.21). Non-mains foul drainage and the use of private sewage treatment facilities should only be considered when it is not feasible to connect to a main sewer on account of cost and/or practicability. Assessment of the suitability of any private facilities should focus on the likely effects on the environment, amenity and public health and should demonstrate acceptable arrangements for long-term management and maintenance of the facilities.
19. If the planning authority is not satisfied that the arrangements are suitable, this failure would normally be sufficient to justify refusal of planning permission. Welsh Government Circular 008/2018, Planning requirement in respect of the use of private sewerage in new development, incorporating septic tanks and small sewage treatment plants, provides guidance for the consideration of new development in areas with no public sewerage system. It lists a number of particular factors to be considered:
 - contravention of recognised practices;
 - adverse effect on water sources/resources;
 - health hazard or nuisance;
 - damage to controlled waters;
 - damage to the environment or amenity;
 - overloading the existing capacity of the area;
 - absence of suitable outlets;
 - unsuitable soakage characteristics;

- high water table (from records/observations of “rest water levels”);
- rising ground water levels;
- flooding; and
- maintenance plan.

Septic Tanks

20. Private sewage treatment/disposal facilities will comprise septic tanks, cesspools or some type of small treatment plant. Septic tanks have been widely used in the past for rural properties and provide a degree of physical and biological treatment. They retain most of the solids, which then have to be removed by tanker from time to time, and they discharge partially treated effluent which percolates into the ground by means of a network of infiltration field drains. These should be designed taking into account the results of ground percolation tests carried out in accordance with BS 6297: 2007 – Code of practice for the *design and installation of drainage fields for use in wastewater treatment*. Sewage discharges to the groundwater (or to surface water) may also require a discharge consent from NRW under the Water Resources Act 1991, depending on the rate of discharge.
21. In considering possible “damage to the environment and amenity”, particular care should be taken to avoid damage to SSSIs, AONBs and public open spaces, bearing in mind also that a proliferation of septic tank discharges can cause considerable harm to the water environment. The presence of aquifers and Source Protection Zones around groundwater abstraction points for water supply may also be critical, as it is NRW policy that discharges to the ground should not be permitted in Inner Source Protection Zones, which may extend some distance around public water supply sources.
22. Provision of a septic tank to serve a single dwelling is permitted development, under the terms of Class E, Part 1 of Schedule 2 to the General Permitted Development Order 1995 (GPDO), subject to certain capacity and location criteria. In other circumstances, planning permission is needed, and Inspectors should have good evidence that the ground has adequate soakage characteristics and that an appropriate area of land for the percolation system can be provided within the Appellant’s control before such permission is granted.

Cesspools

23. Unlike septic tanks, cesspools provide no treatment for the sewage and are merely holding tanks with no outlets. Consequently, they have to be emptied frequently, typically weekly or monthly, depending on their capacity and rate of filling. This compares with septic tanks which only need emptying every few years.
24. Properly installed watertight cesspools, from which the effluent is frequently removed and taken away for treatment, can provide a technically acceptable means of foul sewage disposal. However, if not operated properly, environmental, amenity and public health problems can occur as a result of

frequent overflows due to poor maintenance, irregular emptying, lack of suitable vehicular access for emptying and lack of capacity. It is also not unknown for cesspools to become damaged (deliberately or otherwise) and to leak. Thus, similar considerations to those for septic tanks should be taken into account before allowing a development that would drain to a cesspool. Cesspools are often only considered acceptable as a last resort, e.g. where non-mains sewerage has to be provided within an Inner Source Protection Zone where no effluent discharges to the aquifer are acceptable.

25. BS 6297:2007 gives advice on the design of small STWs, septic tanks and cesspools and, where appropriate, their associated infiltration systems. Amongst other matters, it recommends a minimum distance of 15m to a dwelling or 25m if more than one dwelling is drained. It also recommends consideration of the prevailing wind direction and the adequacy of the vehicular access for tankers.

Private STWs and Package Plants

26. Private Sewage Treatment works, in the form of package plants, use treatment processes that are much the same as those used at the bigger 'public' Sewage Treatment Works which are operated by the statutory undertakers. In principle, perfectly satisfactory effluents can be obtained. The most common package plants consist of Rotating Biological Contactors (RBCs) or High Performance Aerated Filter Units (HiPAF).
27. RBCs feature a cylindrical structure of plates three quarters of which is submerged in a tank of sewage, and which rotates on a horizontal axis such that the bacteria living on the plates are alternately in the liquid and then in the air. These bacteria treat the sewage and, together with a settlement facility within the unit, produce an acceptable quality of effluent for discharge to a watercourse or into ground suitable for it to soak away (via infiltration drains).
28. A HiPAF has settlement zones before and after a filter unit, in which the submerged filter media is artificially aerated. This provides a suitable environment for similar bacteria to treat the sewage to a quality acceptable for discharge to the environment. Both types of plant can be quite compact and can therefore be easily covered over, which is an advantage in visual terms and in the reduction of offensive odours, though they cannot be airtight because air is needed for the treatment processes.
29. Where a private treatment plant is proposed to serve development which will always remain in one ownership (e.g. a factory), it is feasible for NRW to issue the necessary discharge consent and then monitor and enforce the effluent quality in future. However, where such a plant is proposed for a housing development, which would eventually be dispersed among many different ownerships, there can be difficulties in ensuring proper future maintenance of the plant and the enforcement of the discharge consent. In this case the Inspector needs to be satisfied that a specific and legally binding arrangement will be put in place to ensure effective control and operation of the plant for the lifetime of the development. This could be by arrangements for it to be adopted

by a responsible body (e.g. the statutory undertaker or the Council) or by the establishment of a management company with the necessary capabilities and financial provisions.

Public STWs

30. 'Public' Sewage Treatment Works are provided and operated by the statutory undertakers (DCWW and Severn Trent Water in Wales). They have traditionally been designed to screen all incoming flows to remove gross solids and then to accept up to three times the dry weather flow of sewage for full treatment. When sewage flows are higher, between three and six times dry weather flow is usually given partial treatment by some form of settlement in storm water tanks, before discharge to the receiving watercourse, and that retained in the storm water tanks after the storm has passed would usually be returned to the head of the works for full treatment. When even higher flows occur (i.e. more than six times dry weather flow), its high dilution by rainwater renders it acceptable for discharge directly to a watercourse via storm water overflows. Nowadays, for larger works this simplistic approach (based on multiples of the dry weather flow) is often replaced by prescribed formulae (taking account of the proportions of domestic and industrial content) but the principles are the same.
31. The final effluent discharge, storm overflows and any other discharges from a Sewage Treatment Works are subject to discharge consents, which specify limits on flows and water quality, depending on the quality and use of the receiving watercourse. Conditions for final effluent, generally specify the 'Upper Tier' requirements (i.e. the concentrations which must not be exceeded in any sample) and the 'Look-up Table' requirements (which stipulate the concentration which must not be exceeded in a statistical analysis of a number of samples). In most cases such limits will be specified for biological oxygen demand (BOD – sometimes called biochemical oxygen demand) and the suspended solids (SS) and ammonia content of the final effluent. Other standards for parameters such as metals, pesticides, nutrients or colour may be required at certain works where their catchment is particularly subject to such pollutants (e.g. due to industrial discharges from certain processes). BOD is a measure of the amount of dissolved oxygen needed by aerobic biological organisms to break down the organic material present in the water, and so is a measure of the amount of organic compounds present in the water.
32. Most sewage treatment works comprise a sequence of treatment processes across the site. Preliminary treatment at the works inlet removes grit, and screens remove the larger solids. Sedimentation tanks then provide Primary Treatment to clarify the raw sewage by facilitating the settlement of suspended solids. This is followed by a biological Secondary Treatment stage where aerobic bacteria in activated sludge or percolating filters reduce the Biological Oxygen Demand (BOD) of the sewage and normally convert much of the ammonia to nitrate. These stages are typically followed by Final Settlement Tanks where organic material resulting from the biological stage settles out.
33. In some cases, Tertiary Treatment is also required to enable lower discharge consent standards to be met. Examples of tertiary processes include Nitrifying

Filters, to further reduce concentrations of ammonia, Sand Filters/Grass Plots/Gravel Clarifiers to further reduce suspended solids and BOD, and Ultra Violet light/Microfiltration/Chlorination to disinfect the effluent.

34. Some modern Sewage Treatment Works, whilst operating on similar principles, have less physical separation between the various processes and so occupy a smaller footprint. In some cases, the works may be totally or partially enclosed, which reduces the impact of the works, though odour control will still be an important consideration if the facility is sited close to footpaths, housing or areas where people work.
35. All sewage treatment works produce sludge from their various stages of treatment, and this is removed and usually processed at a number of central sites. The sludge is treated to reduce its water content (which accounts for most of its weight and volume, typically 90-95%) and to remove pathogens. A combination of mechanical dewatering (e.g. pressing/squeezing) and aerobic or anaerobic digestion is generally used where limited land area is available, whilst in rural areas air drying and composting is sometimes the simplest approach. Energy can be recovered by the production of methane gas in the anaerobic digestion process.
36. Another modern innovation is the use of Constructed Wetlands (or Reed Beds) to treat the wastewater from small communities with a population equivalent of up to one or two thousand. They can be used for the treatment of domestic sewage, highway run-off, water from airports and construction sites, leachate from landfill sites and waste water from various agricultural and industrial processes. They can provide the main treatment process, preceded only by preliminary screening and a little settlement, or they may be used as a tertiary stage to polish the final effluent.
37. Treatment is provided in shallow gravel or earth filled beds planted with vegetation, usually *Phragmites Australis* reeds. Effluent flows mostly horizontally through or over the surface of the bed, past the roots of the reeds, to an outlet where it discharges to the receiving watercourse. It is essentially a biological process in which complex chemical and microbial interactions occur and, if properly designed and maintained, can produce very satisfactory effluent. These systems are relatively easy to construct, operate and maintain and, although they often need more land than a conventional works, the 'natural look' of growing reeds may be a visual benefit in planning terms.
38. As with the sewerage system, a sewage treatment works has only limited capacity, and any surplus capacity may need to be reserved for 'essential development' or development already granted planning permission. In such cases, it may appear that to allow just one or two dwellings would not significantly affect the water environment, but accumulatively such decisions can have considerable effects. The advice under "Sewerage" above in regard to arrangements to overcome STW shortcomings is also applicable.

Surface Water Drainage and SuDS

39. The creation of impermeable hard surfaced areas, where none existed before, reduces the opportunity for rainfall to percolate into the ground and increases the rate of run-off from the land. This increases the risk of flooding (and pollution) of the downstream catchment as a result of overloaded rivers and sewers. Sustainable Drainage Schemes (SuDS) seek to mimic natural drainage arrangements through systems designed to store water, slow its flow and encourage its infiltration into the ground. Available techniques vary in complexity from water butts through to engineered wetlands. The most appropriate arrangement is determined by the nature of the site and the development proposed. Whatever system is used, its long-term effectiveness will depend on proper management and maintenance, for which funding will be required.
40. It is now Welsh Government policy (PPW10 paragraph 6.6.17 onwards) that new developments of more than one dwelling or where the area covered by construction works equals or exceeds 100 square metres require approval from the SuDS approval body (SAB) before construction can commence. Schedule 3 of the Flood and Water Management Act 2010 establishes SABs in local authorities and gives those bodies responsibility for approving and adopting the approved drainage systems. The new system was introduced in Wales by a Commencement Order in May 2018, which gave effect to Schedule 3 of the 2010 Act. All development subject to planning applications made on or after 7 January 2019 is subject to the new requirement for SuDS approval.
41. Further guidance on SuDS appeals is provided in a separate chapter.

Flooding

42. This part of the chapter supersedes “Flooding and Drainage – Wales Inspector Guidance”, dated June 2015.
43. Flooding often causes misery and, despite NRW's flood warning system, can result in loss of life. It places heavy demands on the emergency services and its consequences can be very expensive in financial terms. Following several national events in recent years, there is no longer certainty that home insurance (and therefore mortgages) will be available in the future in areas at risk from flooding.
44. Riverine (or fluvial) flooding results from high rainfall, or a rapid thaw of snow, generating run-off that cannot be accommodated in the river channel. Coastal flooding however is the result of major storms and wave action, often associated with tidal surges, which create high waves that inundate the land, overtopping or breaching any coastal defences that may exist. Localised flooding can occur practically anywhere as a result of heavy rainfall overloading the local drainage system, or possibly due to blockages of streams and culverts.
45. A number of factors, such as the previous rainfall pattern and the moisture already in the soil, can greatly affect the chance of flooding. However, increasing the impermeable area within a catchment, by providing hard

surfaced development, will increase the run-off to the watercourses, unless mitigating measures have been employed.

46. Surface water flooding occurs when the quantity of water cannot pass downstream because of inadequate pipe or channel capacity, or quite often because of constrictions at bridges or culverts. Any constrictions that exist in rivers can be made much worse by trapped floating debris (such as tree branches). Sewers and other surface water drains can also become blocked by debris after a heavy rainfall event, but serious flooding as a result of inadequate drainage is more commonly caused by inadequate capacity in the system.
47. Groundwater flooding occurs when underground water levels rise above the surface. This is most likely to occur in low lying areas, particularly when underlain by impermeable strata. Here, water levels rise gradually during the winter and subside slowly during the summer. When such flooding occurs, it can take weeks or months to dissipate.
48. When river flooding occurs, built development within the flood plain will both impede the passage of flood water and at the same time reduce the capacity of the flood plain to store the volume of flood water. The storage of water in washlands reduces the volume which needs to be carried downstream until the peak flows subside, when the stored water can drain back into the normal river channel. Both the obstruction of water flows and the loss of storage capacity will raise flood water levels to some extent in the area, thereby increasing the severity of the flooding, and probably causing more properties to be flooded. The obstruction of flood flows will increase water levels upstream, whilst the loss of storage will increase levels downstream.
49. NRW has flood defence powers in relation to all designated main rivers, but there are also many non-main watercourses for which the local authority has powers under the Land Drainage Act 1991. Land drainage consents are required from NRW for developments on, over or under a river and close to a riverbank. These now fall within the scope of the Environment Permitting Regulations.
50. The amount, location and duration of rainfall is a very variable matter and no two storms are ever the same. There is no absolute maximum storm. However, statistically the severity of a particular storm can be assessed in terms of its rainfall intensity and duration. The severity of storms is now described in terms of their percentage probability of occurring in any one year. This helps to explain the fact that, just because there was a rainfall event of that magnitude last year does not mean there is any difference in the probability of another one occurring this year. Statistically, a 1% flood has a 26% probability of occurring once in 30 years and a 49% probability of occurring once in a typical lifetime of 70 years.
51. Sea defences protect the general coastline from the sea and often extend up the tidal reaches of rivers. Significant proportions of the coastal floodplains have been developed over the years with, in many cases, associated coastal defence

works. Hard defences such as sea walls are expensive to construct and maintain, and they can still be overtopped, breached or have their foundations washed out, and this may become more likely as a result of climate change. If flooding from the sea does occur, it can be very rapid, and the consequences may be severe.

52. Where tidal defences protect sizeable developed areas, there is little choice but to maintain them, though there are few instances in which they are likely to be extended. In some places, such as areas of coastal squeeze where coastal features in front of a sea defence are being degraded, it may be considered more sustainable to adopt a policy of managed retreat to allow the sea to encroach naturally onto the land to a new line of defence. This would be reflected in shoreline management plans. The development of salt marshes or mud flats in this way can itself create a soft defence feature, which at the same time will probably increase biodiversity. There are a number of possible options between these two extremes. Proposals for development within such coastal areas should be considered against policies designed to secure compatibility with the long-term objectives for the area.
53. Climate change has a potentially significant effect on flood risk. Rainfall patterns are changing, and we expect to see more days of rain in future and an increase in the average intensity of rainfall events. Sea levels are also rising, although the effect of this is coloured by the fact that the land mass is generally falling in the south-east of England and rising in the north and west. The result of this is that sea level rise will be slightly more in South Wales than in North Wales. Appendix 2 of TAN15 provides detailed advice on the allowances that should be made for climate change when considering the future risk of flooding from rivers and the sea.
54. Welsh Government policy on Development and Flood Risk is at paragraphs 6.6.22 – 6.6.29 of PPW10. It refers to increased risks of flooding in the future due to climate change, to the unsustainability of the continued construction of hard engineered flood defences and to the need to take a strategic approach to flood risk. It advocates a move away from flood defence and the mitigation of the consequences of new development in areas at risk of flooding towards a more positive avoidance of such development.
55. PPW10 advocates a precautionary approach when considering planning applications and says that development should seek to reduce, and certainly not increase, flood risk arising either from river and/or coastal flooding or from additional run-off from development in any location. It also notes that developments located in flood risk areas remain at risk from flooding even if mitigation measures are applied. TAN 15: Development and Flood Risk provides further policy advice on this precautionary approach and provides a framework within which risks arising from both river and coastal flooding, and from additional development in any location, can be assessed.

TAN15 Assessment Framework

56. TAN15 expresses the aims of the precautionary framework as being:

- to direct new development away from areas which are at a high risk of flooding; and
 - where development has to be considered in high risk areas, only those developments which can be justified on the basis of the tests in Sections 6 (justification) and 7 (flooding consequences) are to be located in such areas.
57. Operation of the precautionary principle is governed by the designation of flood zones on the Welsh Government's Development Advice Maps (DAMs), which are reviewed periodically, and the definition of the vulnerability of different types of development to flooding. Section 4 of TAN15 describes the Flood Zones:
- Zone A (no risk of flooding);
 - Zone B (sedimentary deposits indicate historical flooding and the need to check the current risks); and
 - Zone C (within the 0.1% flood risk area for river, tidal or coastal flooding).
- Zone C is further divided into C1 (developed areas of the floodplain served by significant flood defence infrastructure) and C2 (areas of the floodplain without significant flood defence infrastructure).
58. Section 5 of TAN15 allocates the various types of development to one of three categories:
- Emergency services, which need to be operational and accessible at all times;
 - Highly vulnerable development, where the occupants have limited ability to decide about the risks to life and property associated with flooding and where their ability to management those risks is limited (particularly residential premises); and
 - Low vulnerable development, which is generally taken to be industrial premises and land uses of similar limited consequences.
59. Given the historical pattern of development alongside rivers, it is inevitable that much of it falls within Zone C areas. In these circumstances, it is recognised that further urban development should not be completely precluded, particularly bearing in mind the benefits of redeveloping previously used land. However, any new development allowed will not be free from risk, even if protected by flood defences, and the decision maker has to make a balanced judgement based on the tests in Sections 6 and 7 of TAN15.
60. Section 6 makes it clear that highly vulnerable development and development for emergency services should not be permitted in Zone C2. It then sets out the justification test and says that all other new development should only be permitted in Zones C1 and C2 if it is justified in that location. By implication, the same test applies to proposals for highly vulnerable and emergency services development in Zone C1. The criteria refer to local authority regeneration initiatives and strategies and to employment objectives required to sustain an existing settlement, and this is taken to include development plan strategies. They also refer to compliance with PPW aims, including the use of previously developed land, and to consideration of the consequences of flooding.

61. Section 7 makes it clear that, if development meets the test in Section 6, that justification will be in the knowledge that the development will flood and will need to be planned accordingly, and Section 7 and Appendix 1 of TAN15 provide guidance on the assessment of flooding consequences. The judgement on whether a development should proceed or not will depend on whether the consequences of flooding can be managed down to an acceptable level for the type of development concerned. For example, it is not sensible to allow further residential development in a flood risk area if flood warnings cannot be provided and safe access/egress cannot be achieved.
62. In such circumstances, a flood consequences assessment (FCA) has to be carried out to examine the risks and mechanisms of flooding and its likely consequences. The scope and level of detail of an FCA should be appropriate to the size and scale of the proposed development, and more advice on FCAs is provided in Appendix 1 of TAN15. It lists the following matters to be addressed:
- Likely mechanisms of flooding;
 - Likely sources of flooding;
 - Depths of flooding throughout the site;
 - Speed of inundation of the site;
 - Rate of rise of floodwaters throughout the site;
 - Velocities of floodwaters across the site;
 - Overland flood routes;
 - Effects on access to/from the site and on other infrastructure, such as sewerage and sewage disposal;
 - Impacts on natural heritage; and
 - Impacts on flood risks for neighbouring properties and elsewhere on the flood plain.
63. Appendix 1 also provides guidance on acceptability criteria, including acceptable flooding frequency thresholds for different types of development and indicative maximum values for depth of flooding, rate of rise of floodwaters, speed of inundation and velocity of floodwaters. Ministerial decisions have confirmed the importance placed on meeting all of these various criteria. Section 9 summarises the policy requirements and acceptability criteria for different types of development in the various Zones, and Sections 10 and 11 provide particular guidance on considerations for preparation of development plans and in determining applications for planning permission.
64. TAN15 allows for several exceptions to its framework approach. Firstly, it makes exceptions for minor householder development, such as minor extensions and alterations, unless they have direct effects on a watercourse. Secondly, developments which by their nature have to be in waterside locations, such as boat yards and marinas, do not have to be justified in that location but are still subject to the FCA test. Thirdly, changes of use only require FCAs where they would result in a change from a low vulnerability use to a high vulnerability use. And finally, areas of public open space are likely to be acceptable on land at risk of flooding, although any ancillary buildings (even any

subject to prior approval procedures) should be subject to the consequences test in Section 7 of TAN15.

65. Ministerial decisions have confirmed the intention that there should be an “in principle” presumption against highly vulnerable development in Zone C2 and that the policy does not allow a risk assessment to justify such development. They have also confirmed WG’s sustainable objective of moving away from flood defence and mitigation in areas of flood hazard to the positive avoidance of development in such areas. These have clarified how the TAN15 framework is to be applied.
66. NRW provides expert advice on flood risks, and planning authorities (and Inspectors) should have good reasons for not following its advice. However, Ministerial decisions have made it clear that that advice cannot always be relied upon and that it needs to be carefully scrutinised. NRW will advise on the FCA and will comment on flooding risks and consequences and on the suitability of any mitigation measures proposed by the developer. However, it is up to the planning authorities to balance all factors in reaching decisions on development proposals.
67. When considering the risks of flooding of a site which is close to the Flood Zone boundaries on a DAM, it should be remembered that those lines are not fixed but may vary over time as more information on flood events becomes available. Thus, although TAN15 provides a framework for the consideration of flood risks and consequences in the different zones, it is inevitably a simplistic approach. In reality, the risks of flooding vary with topography and there is little difference between sites of 0.99% and 1.01% risk even though they lie on different sides of the 1% risk line.
68. It is understood that TAN15 is to be reviewed in the foreseeable future and may move from its present precautionary approach to a risk-based approach. However, until that occurs, the present TAN15 retains its full policy support.

Water Pollution

69. PPW10 explains that the planning and pollution control systems are separate but complementary, and that planning authorities should work on the assumption that the pollution control regimes will be properly applied and enforced. The planning considerations should therefore take into account any potential for pollution, but only to the extent that it may affect the current and future uses of land. Whilst certain specified waste management activities need planning permission, as a prerequisite to the grant of an environmental permit by NRW, much time can be saved by pursuing the necessary approvals in parallel.
70. The need for compliance with EU water legislation should be considered in the preparation of development plans and may be material to the consideration of individual planning applications. Amongst EU water legislation, the Water Framework Directive (2000/60/EC) is notable in that it provides the main driver for protecting and enhancing water quality in the environment. Statutory River Basin Management Plans are to be produced which have a direct bearing on

land use planning. They include assessment of the status of water bodies, and the Water Framework Directive generally precludes the authorisation of projects where they would cause deterioration of the status of the water body or jeopardise the attainment of good status, though derogation may be sought as a last resort. Where there is risk of a development affecting water body status developers should provide sufficient information to support a Water Framework Directive Assessment. The Water Environment (Water Framework Directive)(England and Wales) Regulations 2017 is the latest implementation legislation.

71. The Directive applies to artificial and modified water bodies as well as to natural ones. Where human activities have significantly changed the shape, form and characteristics of the water environment they are designated as either Artificial Water Bodies (AWB) or Heavily Modified Water Bodies (HMWB), and they include reservoirs, raised flood banks and dredged channels. Mitigation measures may be required to reduce the impacts of activities on the ecology of the water body.

River Waters

72. Surface water bodies are subject to classification for ecological quality and chemical quality. Ecological quality encompasses: biological elements (flora, fauna, etc.; hydro-morphological elements (water flow, depth, etc.; physico-chemical elements (transparency, dissolved oxygen, pH, etc.; and specific pollutants within the UK Environmental Quality Standards (e.g. metals, organic compounds). Chemical status is based on assessing compliance with standards for priority substances and other Environmental Quality Standards (e.g. mercury and benzene). Ecological and chemical status are then combined, and the lowest scoring element determines the water body's overall status.
73. On the positive side, river water quality may be of particular importance in development plan considerations, as it can influence developers' approaches to use of the adjoining land. For example, water of poor quality has no recreational appeal and developers will turn their backs on it. On the other hand, water of high quality may become a major feature of a development. Contact water sports become possible, and restaurants, bars and cafes are attracted to the waterside.
74. NRW is responsible for maintaining and improving the quality of all controlled waters which include groundwater, surface water and some coastal waters. NRW's consent is required for the discharge of potentially polluting material to a surface watercourse or to groundwater. NRW also has powers to serve anti-pollution works notices on a relevant person, if it considers that pollution of controlled waters is occurring or is likely to occur.
75. Diffuse sources of pollution such as nitrates and pesticides applied in the course of agriculture, and various chemical compounds derived from vehicles on major roads can, in total, have just as damaging an effect on water pollution as the more clearly identified point sources. However, because of the national

actions required to control them, it is unusual for such diffuse sources of pollution to be major considerations in planning appeals.

76. NRW discharge consents are designed to prevent the deterioration of river water quality and to achieve the requirements of statutory water quality objectives, including those that flow from EU Directives. It is also important to prevent the escape of potential pollutants, such as oil, into surface water drains as these frequently discharge uncontrolled into nearby watercourses. Fuel oils and other stored substances which could harm water quality should therefore be kept within a suitable bund to prevent spillage being washed into the surface water system or directly into the receiving watercourse. A suitably constructed bunded area also serves to protect groundwater from the effects of spillage.

Groundwaters

77. The Water Framework Directive requires all groundwaters to achieve good status in terms of both quantity (i.e. effects of abstraction on it) and chemical status. It also requires that any upward trend in the concentration of any pollutant be identified and reversed.
78. Chemical pollution of an aquifer can be almost impossible to remedy, and water abstractions from the aquifer may have to be stopped, which may involve high cost alternative supplies being sought. The escape of leachate from landfill sites and other areas of contaminated land may, therefore, be of major concern, though the potential for new contamination to arise is generally controlled through the Environmental Protection Act 1990 and the Environmental Permitting (England and Wales) Regulations 2016.
79. Land that is already contaminated may be voluntarily remediated as part of a redevelopment project. It may also be subject to compulsory remediation (see Statutory Guidance on Contaminated Land issued in 2006 in Wales) where there is “significant risk of significant harm” from contaminants present on the site through an identified pollutant linkage to a receptor. Local Authorities are responsible for this regulation, except when the land is defined as a “Special Site” which includes any that might affect controlled waters, in which case NRW becomes the enforcing authority.
80. With the introduction of this regime and the encouragement to redevelop previously developed land, Inspectors should be aware that detailed site investigation may be necessary to identify possible contamination on a site before there is any certainty over what remedial action will be required. This is particularly the case for land previously used for industrial purposes. Accordingly, that information may be necessary before outline permission is granted, unless it is very clear that the proposed use will be acceptable. The degree of remediation required is dependent on the new land use proposed, with residential use requiring more measures than industrial use. The assessment takes into account the source (or sources) of pollution, the potential linkage path and the nature of the receptor.

81. These considerations are particularly pertinent where NRW has identified Source Protection Zones around significant groundwater abstractions. Zone 1, the Inner Source Protection Zone, is defined as within 50 days travel time for groundwater to the source and, as biological decay does not provide sufficient protection against pollution within that time, polluting discharges should be avoided within the Zone. Zone 2, the Outer Source Protection Zone, represents 400 days travel time and is subject to less onerous restrictions, although it is NRW policy to avoid pollution risks so far as possible. Zone 3 is the rest of the aquifer catchment where certain types of waste disposal may be acceptable, subject to proper containment.

Other Relevant Manual Chapters

82. The following other chapters of the Manual may be of relevance:
- Water Related Specialist Casework, which covers topics such as appeals on abstraction licences, discharge consents and land drainage consents, and Drought Orders/Permits.
 - Sustainable Drainage (SuDS) Appeals.