

Planning for the third cycle River Basin Plan 2021-2027

December 2019



Consultation on Significant Water Management Issues

North Western, Neagh Bann & North Eastern River Basin Districts.

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Chapter 1. Introduction and background

1.1 Water – a vital resource

Water is an essential component of life, it is a valuable resource that we all rely on. Maintaining the quality of our water environment will help protect and improve public health, support agriculture and industry, protect and improve biodiversity and ecosystems, support tourism and recreation and help adapt to, and protect us from, impacts of climate change.

A catchment-based approach to managing the water environment

A catchment is an area of land delineated by elevation (e.g. the peak line of a mountain range) through which rain water (or melting snow or ice) drains into a water body (river, lake or reservoir, coastal water body, groundwater).

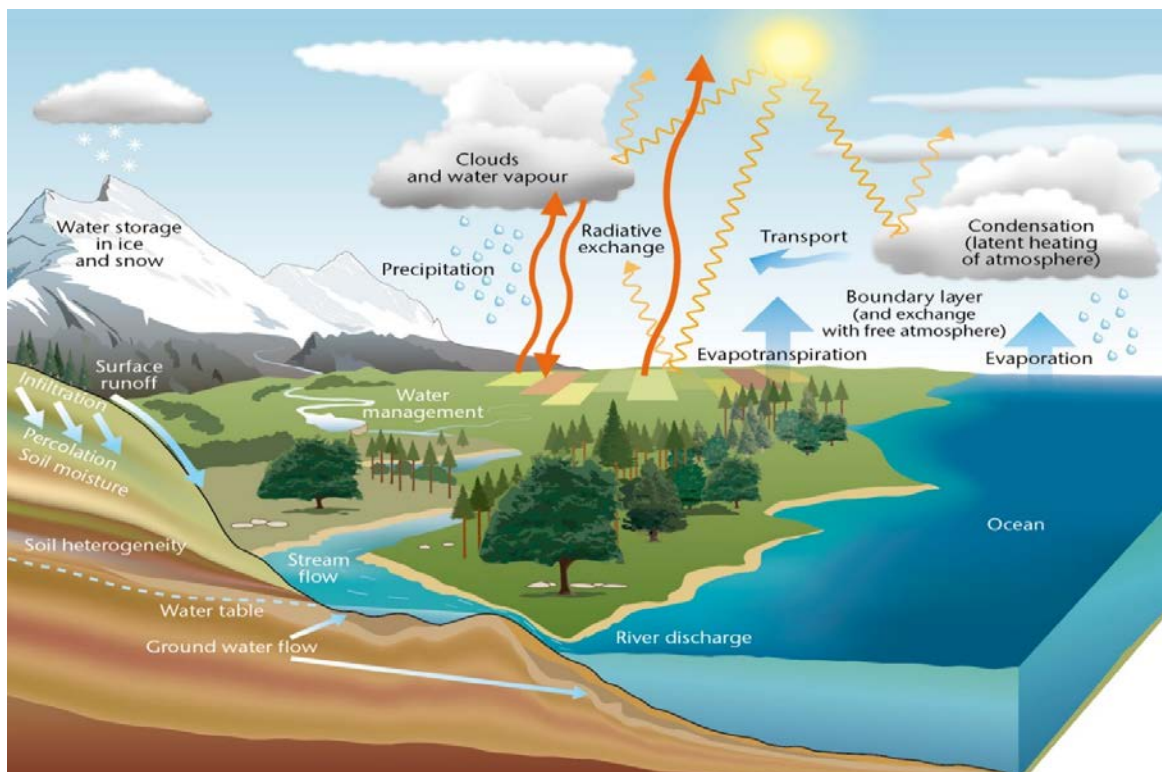


Figure 1: The water cycle shows that the water bodies (rivers, lakes, coastal water bodies and groundwater) in a catchment are not separate to each other, but a continuous volume of water¹.

The hydrological cycle (or water cycle) is a model used by pupils, students, water engineers and scientists across our planet to describe the different stages water

¹ www.metoffice.gov.uk

goes through during its journey from the oceans to the atmosphere, onto the land and back to the oceans. The different stages of the cycle are illustrated in Figure 1.

The water cycle also illustrates that the water in a catchment includes groundwater, coastal and marine water bodies, lakes and rivers. These water bodies are hydraulically linked, meaning that the water is connected and flows between them.

Large catchments are called river basin districts and include all water bodies within the district. Hence river basin plans do not just deal with rivers (as the name might suggest), but also with lakes, coastal and marine water bodies and groundwater associated with those rivers.

1.2 Purpose of this document

River Basin Management planning is a key element in implementing the Water Framework Directive (WFD), taking an integrated approach to the protection, improvement and sustainable use of the water environment. WFD was established in law in Northern Ireland on 22 December 2003 through the Water Environment (WFD) Regulations (Northern Ireland) 2003 (SR 2003 No. 544). It applies to groundwater and to all surface water bodies, including rivers, lakes, transitional (estuarine) and coastal waters out to one nautical mile.

The 1st cycle River Basin Management Plans (RBMPs) were published in December 2009. 'Good' or 'High' status water bodies were identified and objectives were set for improvement of substandard water bodies, or prevention of deterioration. This established a baseline against which the effectiveness of future River Basin Management measures could be assessed and monitored. WFD requires RBMPs to be reviewed and updated every 6 years. Over the period of implementation of the First Cycle RBMPs, between 2009 and 2015, WFD status assessments showed an improvement from 28 % to 37 % of all water bodies.

The 2nd cycle Plans were published in December 2015 and set out a programme of measures to achieve objectives for the improvement or the prevention of deterioration of individual river, lake, marine and groundwater for the next two river basin planning cycles to 2021 and 2027.

Northern Ireland Environment Agency (NIEA) has been working with other government departments and public bodies, water users and land managers to make the improvements needed. We have also been carrying out monitoring to improve

our understanding of the pressures and the impacts on the water environment and the effectiveness of the actions we have been taking.

The information contained in this Significant Water Management Issues (SWMI) report sets out the latest assessment of the pressures and impacts on the water environment; describes the progress we have made towards achieving our objectives for 2021; and identifies the significant water management issues that need to be addressed in the 3rd cycle draft RBMP. The 3rd cycle plan, which must be published by December 2021, will outline what measures will be undertaken to protect and improve our water environment, enabling them to reach good status by 2027.

1.3 Key Objectives of the Water Framework Directive

The five core objectives of the Water Framework Directive are:

- No deterioration of status for surface and groundwater bodies; and protection, enhancement and restoration of all water bodies.
- Achievement of good status for all water bodies. This comprises the objectives of good ecological status and good chemical status for all natural surface water bodies; good ecological potential and good chemical status for all heavily modified or artificial water bodies; and good quantitative status and good chemical status for all groundwater bodies.
- Progressive reduction of pollution of priority substances and phase-out of priority hazardous substances in surface water bodies, and prevention and limitation of the input of hazardous substances and non-hazardous pollutants in groundwater bodies.
- Reversal of any significant upward trend of pollutants in groundwater bodies.
- Achievement of standards and objectives set for protected areas in Community legislation.

1.4 Key Water Framework Directive terminology – non-technical summary

The Water Framework Directive uses its own terminology and selected key words are explained in non-technical language below:

- **Classification:** classification determines the status of each water body and establishes if there are any problems with the water body.
This work is mostly carried out by NIEA's and Department of Agriculture, Environment & Rural Affairs (DAERA's) Marine and Fisheries Division's Monitoring and Assessment Teams.
- **Status:** describes how good each water body is in terms of quality, quantity (volume/ flow) or ecology. It is expressed on a 5-point scale ranging from high – good-moderate-poor-bad. Groundwater bodies are an exception and are classified on a 2-point scale: good and poor.
- **Programme of Measures:** These are actions devised to address the problems identified during classification.
This work is carried out through a group of delivery partners including DAERA's operational, regulatory and policy teams, other governments departments, environmental non-governmental organizations and other stakeholders.
- **Objectives:** Objectives are the aims that are set for each water body and the new status that each water body should achieve at the end of the River Basin Planning cycle.

1.5 Implications of EU Exit for River Basin Management Plans

The UK is currently in the process of leaving the European Union (EU). The EU Withdrawal Bill will carry over existing EU law, including the requirements of the Water Framework Directive (WFD), into domestic law. Technical changes will be made to the legislation relating to river basin planning so the law remains operable after EU Exit.

The obligation to review and update the RBMP is set out in our domestic law, principally the Water Environment (Water Framework Directive) (Northern Ireland) Regulations 2017

(<http://www.legislation.gov.uk/nisr/2017/81/contents/made>) and these obligations will continue to apply. We will therefore complete the review and update to the plan in 2021 as required by these Regulations.

1.6 Other relevant Plans and Strategies

A RBMP addresses how we can best protect and improve the water environment and the benefits that water in all its forms provides people and

society. To achieve this, the plan draws together the aims, objectives and actions from a number of other water related plans and strategies. Further details of the key plans are available in Appendix 1. This integrated approach helps those responsible for completing the actions to see the opportunities for linking up and achieving better outcomes for all. The WFD relies on various interlinkages and the fulfilment of requirements of other European Directives which have been transposed into domestic law to achieve its objectives.

The infographic below (figure 2) indicates some of the key interactions and considerations within river basin management planning, however it is not exhaustive.

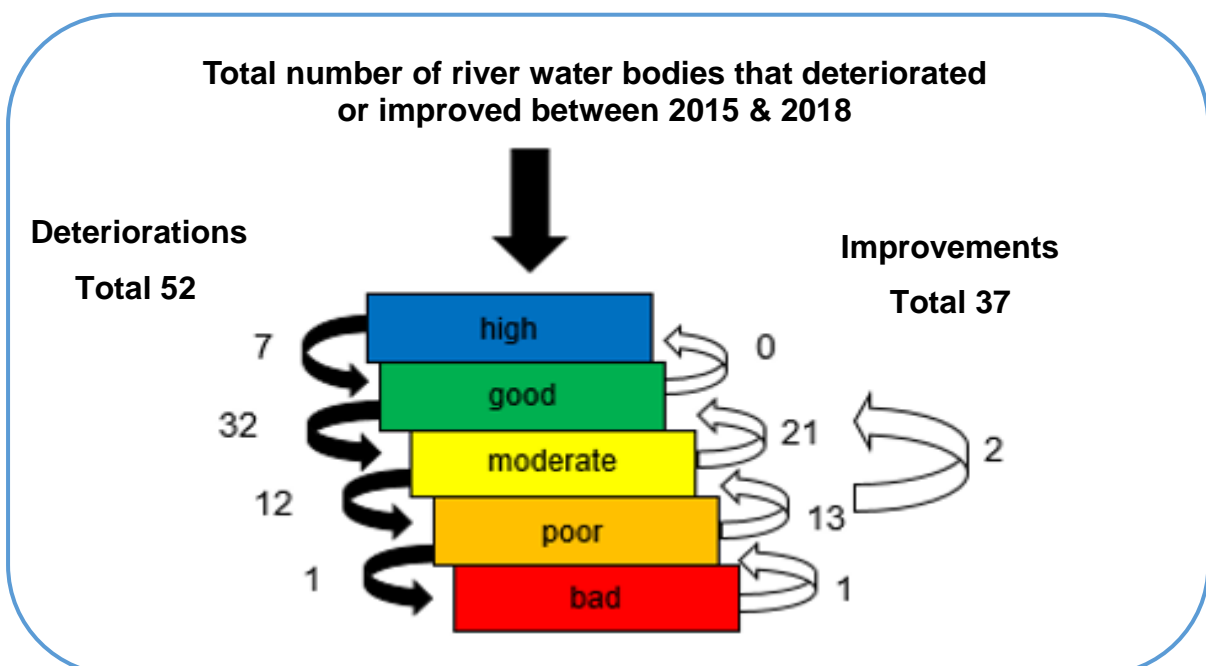
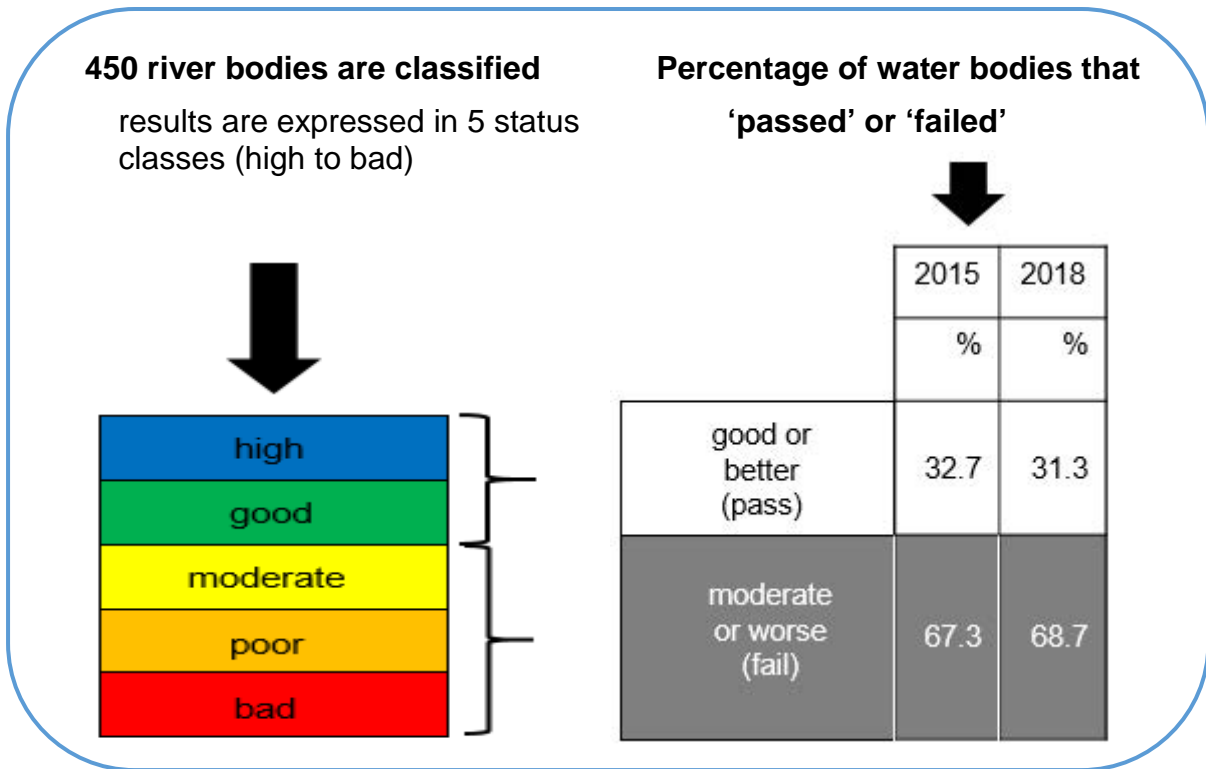


Figure 2: Key interactions and considerations within river basin management planning

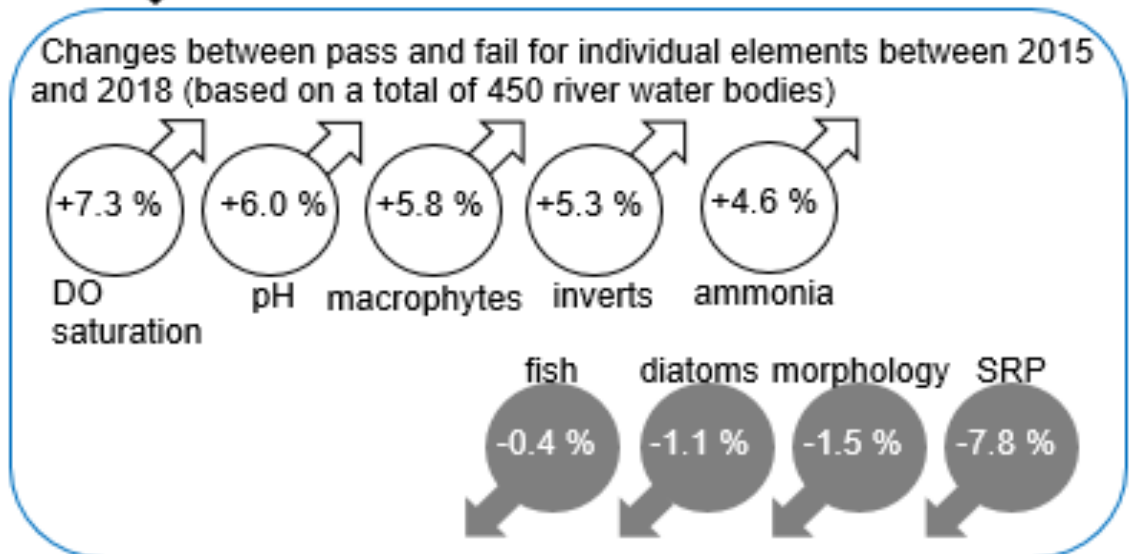
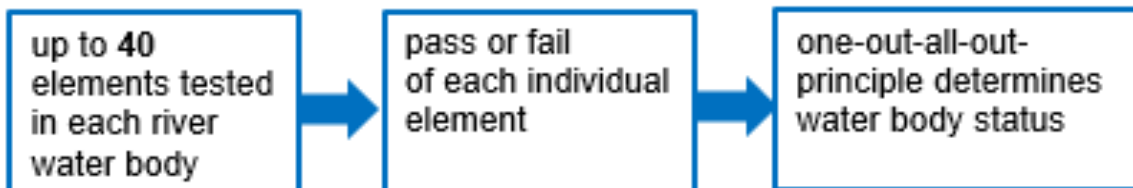
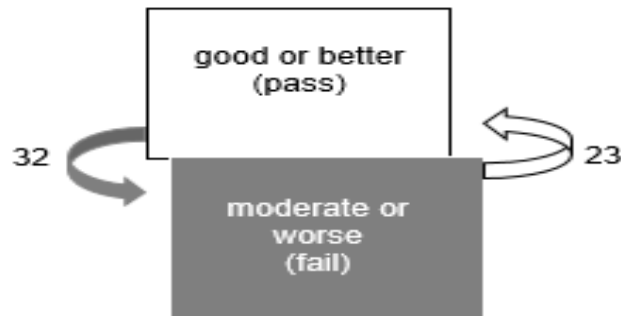
Chapter 2: Summary of water quality status results 2018

DAERA carried out a mid-cycle update of the classifications of water bodies during 2018. The results are summarized in this chapter and more detailed information can be found in Appendix 2: Overall water quality status interim results and pressure analysis.

2.1 Summary results for river water bodies



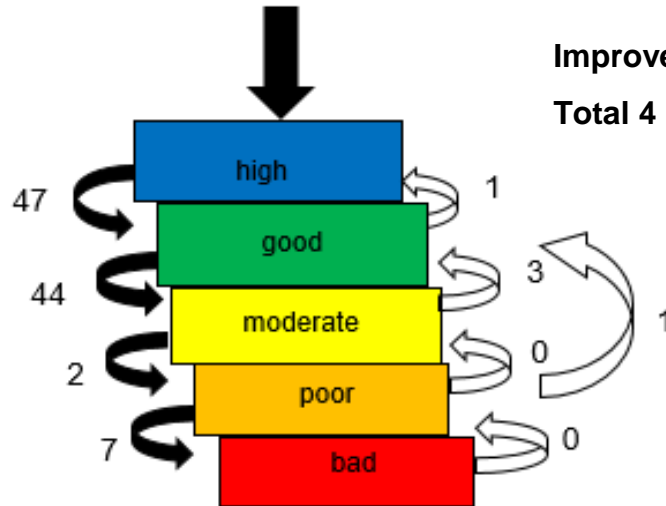
Number of river water bodies that changed from 'pass' to 'fail' or vice versa between 2015 & 2018



Change in Soluble Reactive Phosphorus status from 2015 to 2018

**Deteriorations
Total 100**

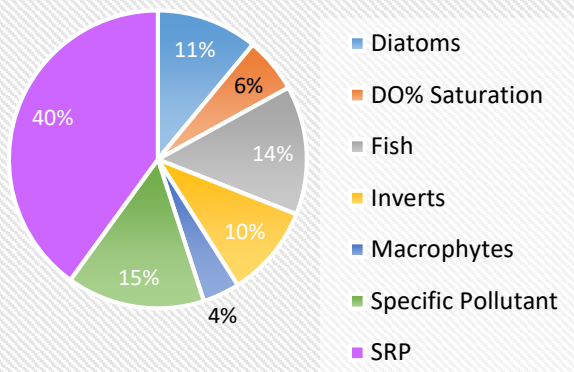
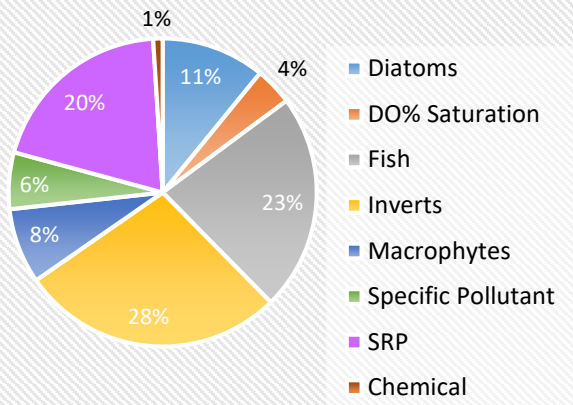
**Improvements
Total 4**



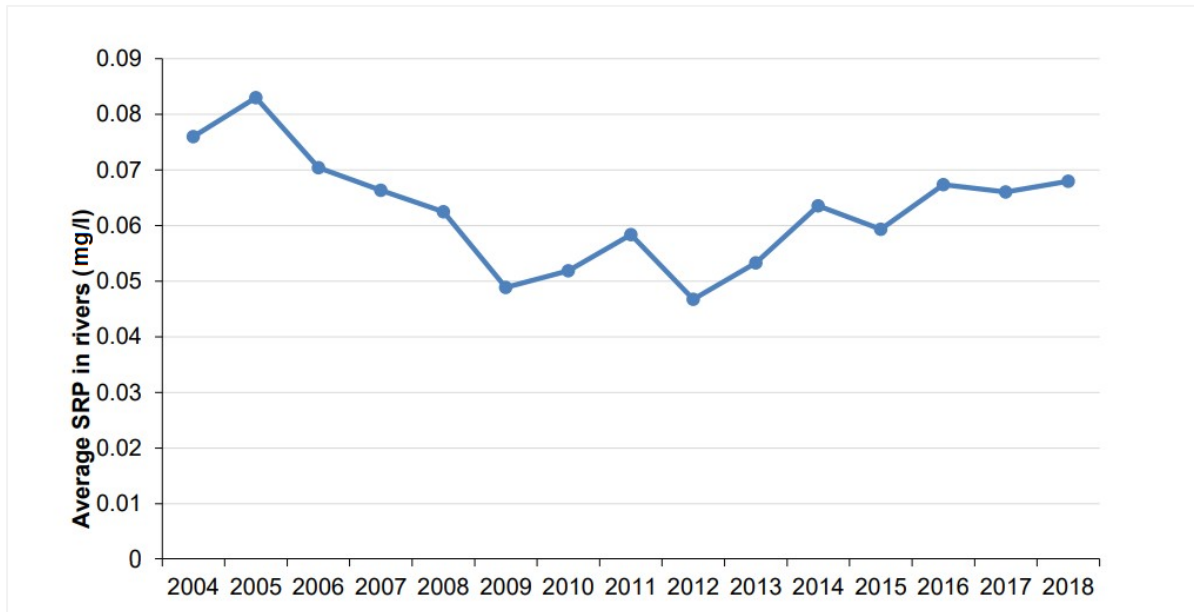
In water bodies where only **one** element failed the reasons were:

Single failing elements in 2015

Single failing elements in 2018



**Programme for Government (PfG) Outcome 2 indicator:
Soluble Reactive Phosphorus (SRP)**

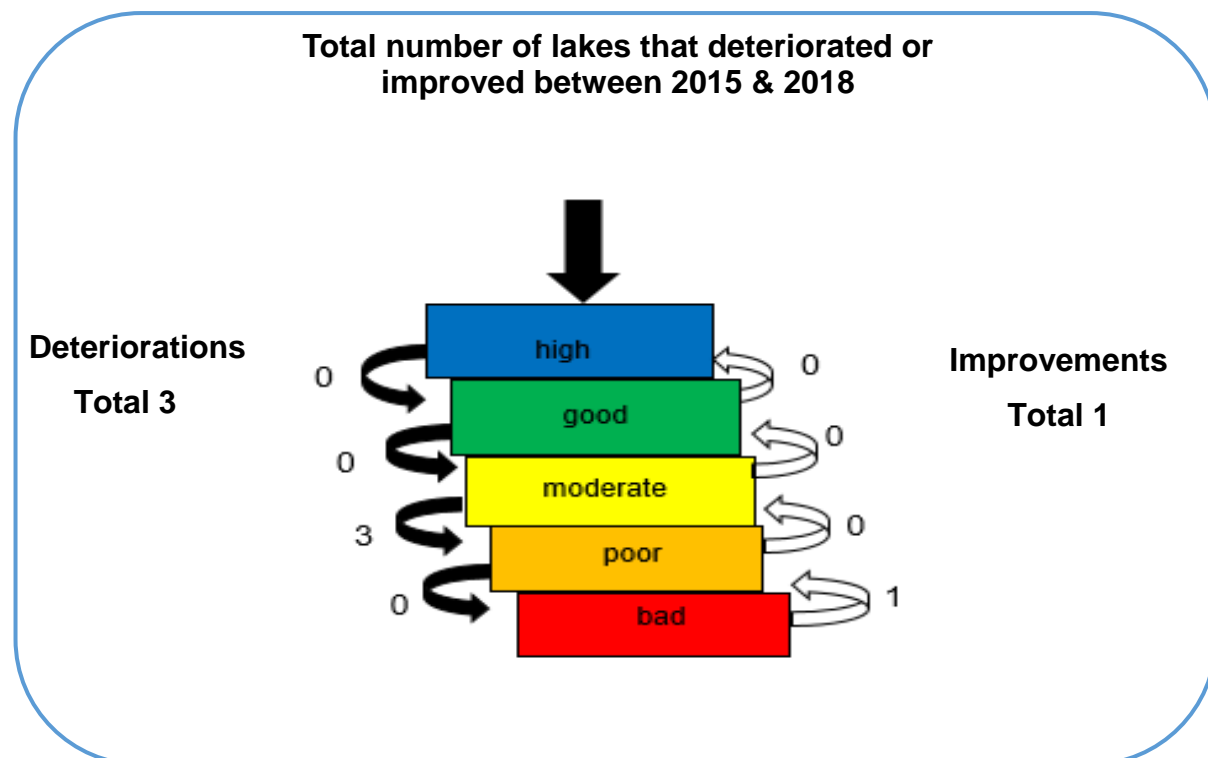
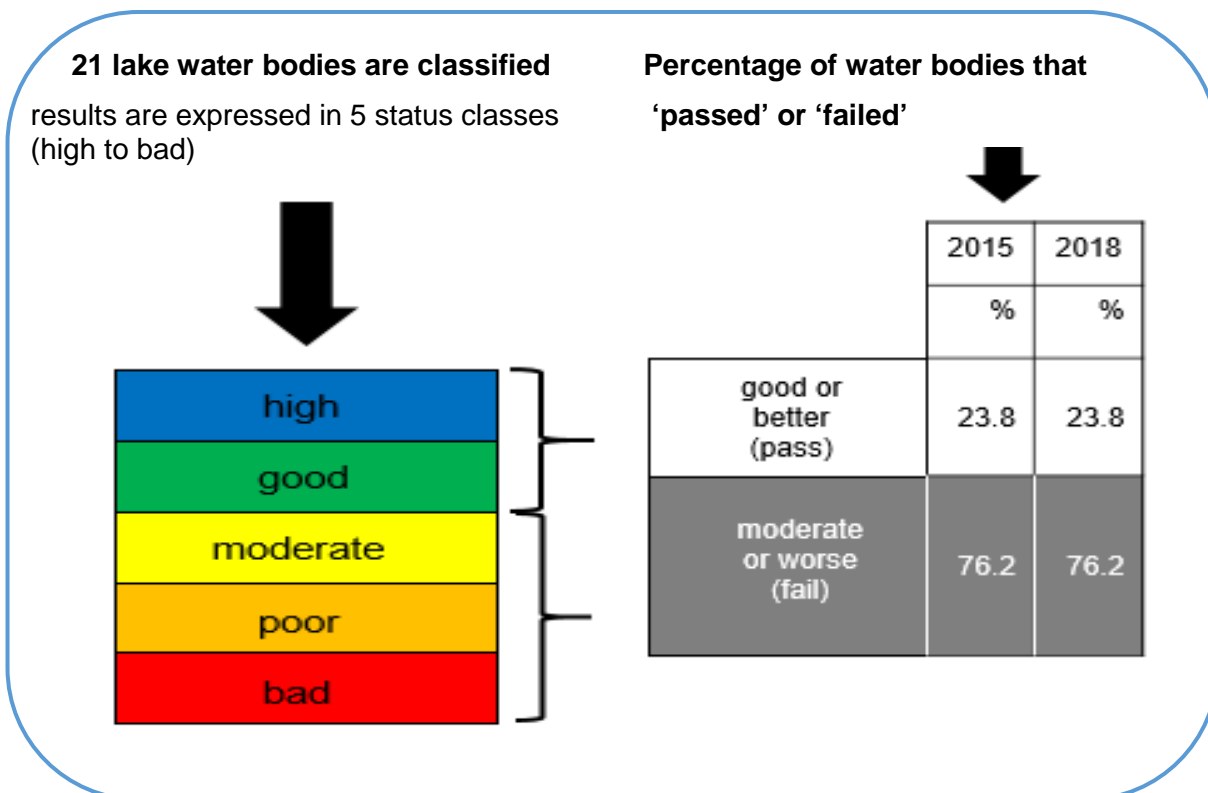


Soluble Reactive Phosphorus in rivers (NI Environmental Statistics Report 2019²)

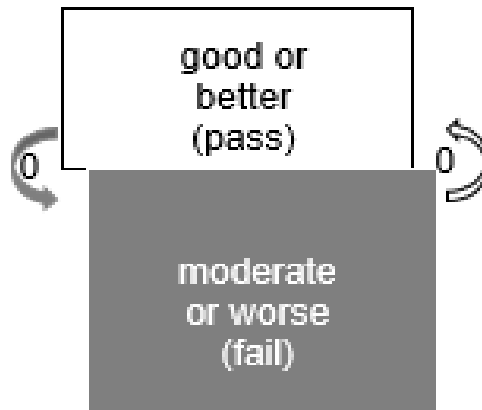
Levels of SRP have increased and there are signs of a sustained upward trend since the low of 0.047 mg/l reported in 2012. In 2018 the average concentration was 0.068 mg/l. SRP in river water is considered unchanged since the baseline year of 2015 for PfG reporting purposes but an increasing trend is evident.

² <https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ni-environmental-statistics-report-2019.pdf>

2.2 Summary results for lakes



Number of lakes that changed from 'pass' to 'fail' or vice versa between 2015 & 2018



2.3 Summary results for groundwater

- 75 groundwater bodies are classified
- results are expressed in 2 status classes (good and poor)



Percentage of water bodies that passed or failed (overall status)

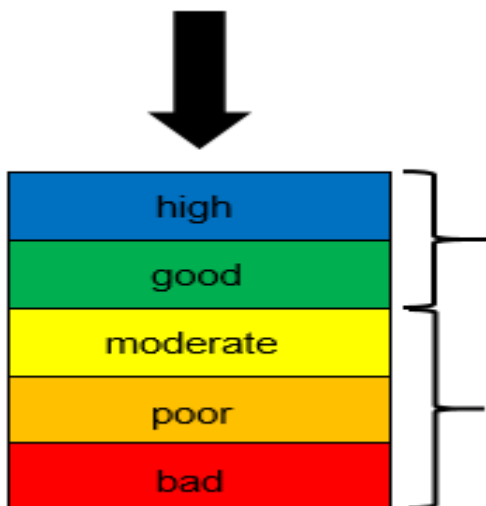


2015	2018
%	%
65.3	65.3
34.7	34.7

Note: Groundwater body classification was not updated in 2018 due to the slower flow and transport processes in groundwater and the related lower sampling frequency.

2.4 Summary statistics for transitional and coastal water bodies

25 transitional & Coastal waterbodies are classified
 results are expressed in 5 status classes (high to bad)



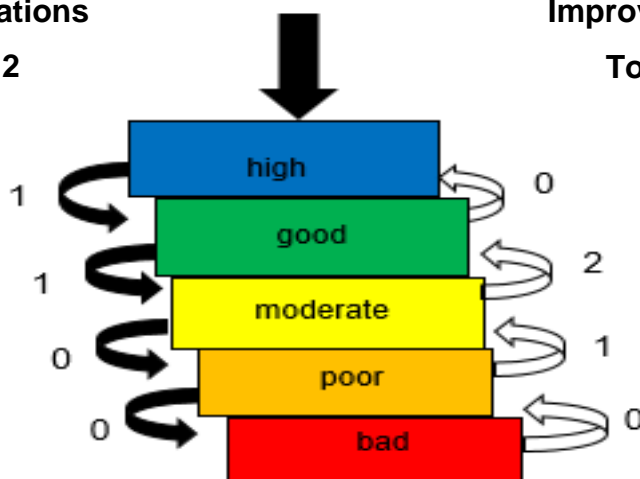
Percentage of water bodies that 'passed' or 'failed'

	2015	2018
	%	%
good or better (pass)	36.0	40.0
moderate or worse (fail)	64.0	60.0

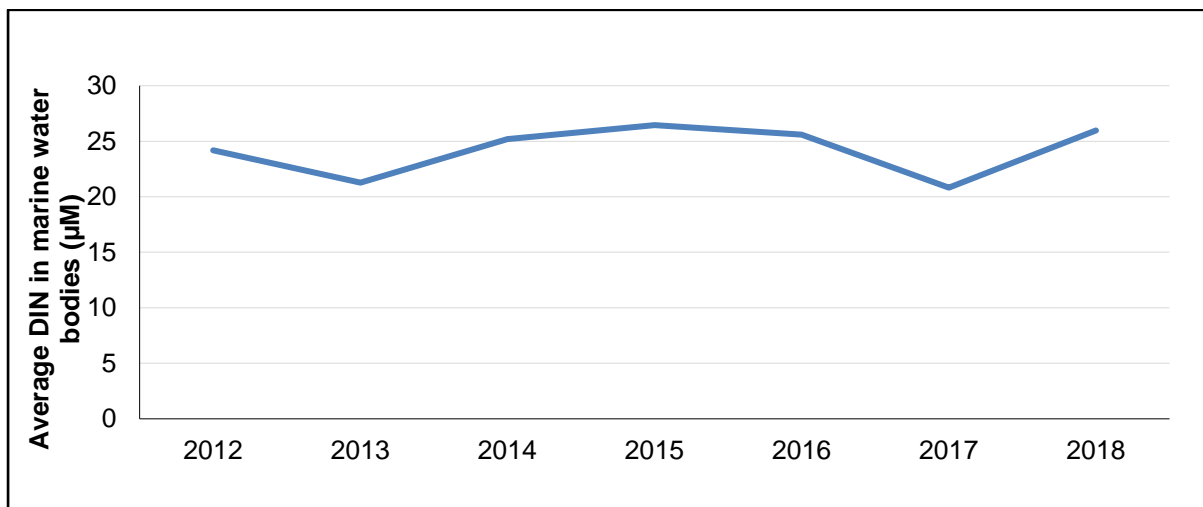
Total number of Transitional & Coastal water bodies that deteriorated or improved between 2015 & 2018

Deteriorations
 Total 2

Improvements
 Total 3



**Programme for Government (PfG) Outcome 2 indicator:
Dissolved Inorganic Nitrogen (DIN)**



The levels of winter DIN remained relatively stable between 2012 and 2016. In 2017, winter DIN fell to a low of 20.82µM. This was a 5.6µM decrease on 2015 levels and therefore a positive change since the baseline year for PfG reporting. In 2018, winter DIN increased again to 25.96µM which remains within the bandwidth of no change compared to the 2015 baseline.

Chapter 3: Significant Water Management Issues

3.1 Diffuse pollution from Agriculture

Agriculture accounts for approximately 70 % of the total Northern Ireland land area of 1.4 million hectares, and characterises much of the rural landscape. The agricultural industry is predominantly grass based, with grazing livestock accounting for more than two-thirds of the gross industry output. Agriculture and the agri-food sector makes a very important contribution to the economy of Northern Ireland.

The most significant pressures on water quality are from the release of the nutrients phosphorus and nitrogen from agricultural sources. Agriculture can also give rise to sediment entering waters due to damage caused to river banks and lake shores by livestock trampling and from other types of land disturbance e.g. ploughing and overgrazing. Agricultural activities are also a source of certain microbial vectors causing human illnesses including cryptosporidium and e-coli bacteria which can be an issue in bathing water areas. Other pressures from agriculture include the contamination of waters from hazardous chemicals, such as pesticides and sheep dip.

Pollutants including excess nutrients are also washed into the soil and percolate into groundwater leading to an increase in pollutant concentrations. As flow and transport processes are a lot slower in groundwater than surface water it is very important to prevent pollution in the first place. Remediation of groundwater is often very expensive (in the order of millions of pounds) and can take a very long time (up to decades).

Diffuse agricultural pollution is believed to be the primary cause of pollution in impacted river sites assessed during the period 2015 – 2018, using SRP concentrations as an indicator. The agricultural sector has grown since 2015. Annual data on livestock numbers show increases between 2015 and 2018, particularly within the pig and poultry sector with increases of 11 % and 23 % respectively, as well as volumes of both feedstuffs and fertilizers delivered within Northern Ireland. These data sets are all available to download from the DAERA³ website.

³ <https://www.daera-ni.gov.uk/articles/agricultural-statistics>.

In 2018, agricultural related pollution incidents of point source have remained constant and are responsible for 30 % of all incidents. In 2018, there was an increase in farms breached through planned Cross Compliance inspections under the Statutory Management Requirement (SMR 1 Protection of Water against Nitrate Pollution), with 70 of the 271 farms visited having at least one breach recorded (26 %), compared to 2017, when 30 farms of the 266 visited had at least one breach recorded (11 %). It should not be assumed that this reflects a deterioration in compliance across all farms, as NIEA have also changed its inspection regime to target those areas where non-compliance is most suspected.

Increasing agricultural production within the context of the overall objective of protecting and improving water quality is challenging. Society need to work together to develop innovative approaches to manage nutrients sustainably and reduce pressure on the water environment.

What are we currently doing to control pollution from agriculture?

In addition to the programme of measures listed in the 2nd cycle RBMP, there have been a number of new additional regulations, projects and research introduced since 2015 to help better address the pressures from farming and this research should yield practical measures for farmers and for catchment management in order to provide sustainable long term solutions. These are listed below and further information can be found in Appendix 3.

- The Nitrates Action Programme and the Phosphorous Regulations have been revised and combined into the **Nutrients Action Programme (NAP) 2019-2022**. The Nutrient Action Programme (Amendment) Regulations (Northern Ireland) 2019 came into operation on 15 October 2019. The revised NAP has new measures to promote more efficient nutrient management and best practice⁴.
- **The Knowledge Advisory Service (KAS)** was set up in April 2018 as a single Advisory service aimed at supporting Northern Ireland's farm and food businesses.
- The **Environmental Farming Scheme (EFS)** is DAERA's agri-environment scheme under the Rural Development Programme 2014-2020. EFS has been designed to address specific environmental needs, primarily relating to biodiversity and water.

⁴ www.daera-ni.gov.uk/sites/default/files/publications/daera/new-nap-measures-information-for-farmers-11-July-2019.PDF

- The **Sustainable Agricultural Land Management Strategy** for Northern Ireland was published in 2016 and contains further recommendations aimed at reducing phosphorus levels and managing agricultural land more effectively.
- The **Water Catchment Partnership (WCP)** is a working partnership established with representatives from NIEA, Ulster Farmers Union (UFU), NIW, DAERA and the Voluntary Initiative to help address significant water quality issues caused by pesticides in Northern Ireland.
- **Sustainable Catchment Area Management Programme Northern Ireland (SCaMP NI)** aims to improve the quality and reliability of the water received at NIW's raw water abstraction points through sustainable catchment based solutions that focus on protecting and enhancing the natural environment.
- **INTERREG VA** funded projects
 - **Source to Tap** aims to improve water quality in the cross border Erne and Derg catchments.
 - **CatchmentCare** aims to improve the water quality across 3 cross border catchments; the Finn, the Blackwater and the Arney. Further details on the INTERREG VA funded projects can be found in Appendix 6: Working Together.

Measures under development

- An Ammonia Action Plan is currently being developed to deliver tangible and sustained reductions in ammonia, thus reducing the pressure on sensitive sites whilst facilitating the sustainable development of a prosperous agri-food industry.
- Priority catchments – NIEA will carry out further investigations during 2019 in the waterbodies where soluble reactive phosphorous (SRP) has led to deteriorating from good status to moderate or poor since 2015.
- **Do you think that these measures will be enough to address pollution from agriculture?**
- **If not, what additional measures would you like to see happening?**
- **How can we support the farming sector to excel at innovative solutions which benefit both productivity and the environment? What should these solutions look like?**

3.2 Urban Development

Urban Development is the second significant pressure on water quality and is a result of sewage treatment ranging from the NIW sewerage system, private wastewater treatment and single house domestic discharges. Sewage effluent can be highly polluting as it contains nutrients, organic matter, toxic substances, litter, bacteria and viruses. In the environment this can have direct and indirect impacts such as eutrophication, the removal of oxygen from a water body, the introduction of priority and hazardous substances that do not degrade and accumulate within fish and other organisms and cause public health issues for water contact sports and food production industries. For these reasons sewage treatment and disposal have significant regulatory regimes in place to manage and control the impact.

NIW is the sole provider of water and sewerage services in Northern Ireland managing 16,000 km of sewers and 1,030 WWTWs serving 2.1 million people across Northern Ireland. There are approximately 2500 Private Wastewater Treatment Plants and approximately 125,000 Domestic Discharges all regulated under the Water (Northern Ireland) Order 1999 as amended.

Storm water is a significant pressure on the sewerage infrastructure where there are combined systems carrying both foul and storm water. In periods of intense rainfall combined sewerage systems are designed to protect public health and will discharge directly to the environment to avoid sewage flooding. Climate change is expected to produce more extreme rainfall events at a greater frequency than those currently experienced and as a result, strategic drainage management is required to remove storm water from the sewerage systems to minimise the impact on water quality.

Cross departmental approach is required to develop sustainable drainage and sewerage infrastructure and significant advances have been made in this area during the 2nd Cycle however lack of funding has hindered progress.

What are we currently doing to control pollution from Urban Development?

NIEA regulates NIW discharges to the environment under the Water and Sewerage Services (Northern Ireland) Order 2006 and the Water (Northern Ireland) Order 1999, and the Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013. There are a number of measures underway to address these impacts which are listed below and further information can be found in Appendix 4.

3.2.1 Northern Ireland Water: Provider of Sewerage Services

- **PC15** - NIW is currently funded under a Price Control Process, a 6 year investment programme which is regulated by the Utility Regulator. NI Water's PC15 business plan had called for funding of £1.7 billion from 2015 – 2021 to address investment priorities in water and sewerage infrastructure. However the Utility Regulator's PC15 Final Determination concluded that £990 million was appropriate in terms of delivering the improvements to water and sewerage services as required by policy, while remaining affordable to the customer in terms of charges.
- **PC21**- NIW is currently developing its business plan for the next price control period PC21 (2021-2027). The investment needs have been calculated to be approximately £3 billion by NIW. The funding requirements relate to a legacy of underfunding, ageing assets, population growth including the need to respond to the pressures arising from Climate change. However, before funding is made available, these investment needs have to be determined by the Utility Regulator.

3.2.2 Misconnections to NIW Storm Drainage Systems

All new houses and businesses should have two separate sewers, separating foul water to the sewer and storm water to discharge to local watercourses. When pipes are incorrectly connected, misconnections occur resulting in direct discharge of sewage to watercourses. This tends to be either in older properties or where new appliances are connected incorrectly.

Misconnections can pollute local streams, rivers and beaches, damage wildlife and put health at risk. DfI, DAERA, NIW, District Councils and NIEA are working together to tackle the issue of misconnections focusing on preventative measures.

- **ConnectRight campaign** is a partnership of organisations who are working to reduce water pollution from drains and sewers.
- **Strategic Drainage Infrastructure Plan for Belfast.** In July 2014, the Northern Ireland Executive agreed to set up an interdepartmental group to develop a 'Strategic Drainage Infrastructure Plan' (SDIP) for Belfast to **protect** against flood risk, **enhance** the environment and support economic **growth**. It is estimated that the delivery of this programme will cost in the region of £1b. This funding is currently not secured.

- **Sustainable Drainage** - The Stormwater Management Group (SMG), is an inter Departmental Group jointly led by DfI and NIEA seeking to increase the implementation of SuDS across the province looking at ways to increase use across Government Departments and considering the skills capacity in Northern Ireland to deliver SuDS schemes. Examples are included in Appendix 2 under Sustainable Drainage.
- **Catchment Based approach to consenting** NIW, AFBI and DAERA are working collaboratively on the development of an Integrated Ecosystem Model. The Model has been designed to model the complete catchment considering all inputs both point and diffuse sources within the freshwater and marine environment. The Model outputs will identify where investment is needed to make the most benefit to water quality and delivery of the WFD Good Status.
- **Shared Waters Enhancement and Loughs Legacy (SWELL)** aims to improve water quality in the shared transitional waters of Carlingford Lough & Lough Foyle through the improvement of wastewater assets investing approximately £25 million.
- **Sustainable Wastewater Treatment Technologies** - NIEA has been working with NIW on the development of these schemes to ensure the treatment meets the WFD requirements.

3.2.3 Private Wastewater Treatment

Discharges from Private Waste Water Treatment systems serving small housing developments and single domestic discharges are regulated under the Water (Northern Ireland) Order 1999 through the granting of discharge consents.

A risk based approach is applied to compliance assessment where proactive compliance sampling of treated effluent is carried out on those discharges presenting a risk to the water environment based on the volume and the strength of the effluent. Regulatory compliance sampling may be carried out 4/6/12 times per annum to assess the quality of the effluent against the discharge consent standards. Where non-compliance has been detected action is taken in line with the NIEA Enforcement policy.

Due to funding constraints and the continued capacity pressures on the NIW sewerage infrastructure, there are approximately 70 towns across the province which are either at, or nearing, capacity. As a result NIEA is seeing a rise in consent

applications from Housing Development which would have normally connected to the public sewer.

There is a need to review the consenting policies for Private Wastewater Treatment to take account of the new large Housing Development proposals. The policies need to take account of a catchment based approach, treatment requirements for NIW adoption, and the Urban Wastewater Treatment Directive (UWWTD) requirements when discharging into sensitive areas.

3.2.4 Domestic Discharges/ Septic Tanks

Domestic Discharges are regulated under the Water (Northern Ireland) Order 1999 as amended and require a consent to discharge to the aquatic environment. The conveyancing process for the sale of properties is driving up compliance by ensuring correct consents are in place for domestic discharges at the point of sale. There is now approximately 125,000 consented domestic discharges in Northern Ireland. The application process assesses the suitability of the systems proposed or existing, carrying out site inspections for all existing to ensure the systems are operating as they should.

Individual Domestic Discharges are considered to be a low risk to the aquatic environment causing low severity localised impacts and therefore no compliance inspection programme is in place. However, cumulative impacts can sometimes cause non-compliance which can be detected as a result of catchment management work or through complaints. Where non-compliance has been detected NIEA will work with the discharger to achieve voluntary compliance. Failure to comply will result in the discharge becoming higher risk and added to the compliance assessment programme resulting in an annual fee until compliance is achieved.

The catchment based work under development with NIW and AFBI will identify the loading pressures from Domestic Discharges/ Septic tanks. The catchment based source apportionment modelling will inform future policies for the appropriate regulation of Domestic Discharges, to ensure a sustainable approach is applied for future generations.

- **Do you think these measures will adequately address pollution from urban development?**
- **If not, what additional measures would you like to see happening?**

3.3 Industry

Industrial activities can adversely affect the quality of groundwater and surface waters when there are unregulated discharges from industrial processes to the water environment. If not regulated and controlled appropriately, industrial discharges can result in significant impacts to the aquatic environment. Regulated discharges from these activities are captured under the industry pressure.

Industrial discharges are regulated under three regimes to protect the water environment. The Pollution Prevention and Control (Industrial Emissions) Regulation (NI) 2013 (PPC), the Groundwater Regulations (NI) 2009 and the Water (Northern Ireland) Order 1999 as amended.

Integrated Pollution Prevention and Control (IPPC) is a regulatory system that employs an integrated approach to control the environmental impacts of certain industrial activities. Regulation of installations listed in Schedule 1 of the PPC Regulations require a PPC Permit. PPC permits contain a number of conditions in relation to the protection of groundwater and surface waters and site inspections ensure that permit conditions are being met. This applies to many industrial sectors, including the intensive farming of pigs and poultry. The livestock thresholds for PPC are capacity for: > 40,000 poultry; or > 2,000 production pigs above 30kg; or > 750 sows. There has been a significant expansion in the NI broiler sector since 2015 with 72 new permits issued for intensive poultry farms and a further 20 PPC permit variations issued for expansions to intensive poultry farms.

For other industrial activities not covered by the PPC regulations, discharges are regulated under the Water (Northern Ireland) Order 1999. Both the PPC Permit and the Consent to discharge authorisations set limits on the quality of the discharge to ensure protection of the receiving water body. These limits are based on standards set by the WFD, the Groundwater Directive and the Habitats Directive.

Extensive regulatory regimes are in place to assess compliance with the discharge standards. A risk based approach to compliance assessment is applied carrying out pro-active compliance sampling of discharges which present a risk to the aquatic environment taking in to account the quantity and quality of

the effluent. Discharges are sampled 4, 6 or 12 times per year, the frequency of the sampling regime is dependent on the level of risk perceived. Any detection of non-compliance is handled in line with the NIEA Enforcement Policy. Compliance with discharge standards is usually good with 90 % of operators in full compliance.

Guidance on groundwater and chemical storage can be found in Pollution Prevention Guidelines (PPG)⁵ notes 2, 8, 18, 22, 26, 27.

- **Do you think these regulatory measures adequately address pollution from industry?**
- **If not, what additional measures would you like to see happening?**

⁵ <https://www.sepa.org.uk/regulations/water/guidance/>

3.4 Abstraction and the physical condition of the water environment

Abstraction is the removal of water, permanently or temporarily, from the water environment. Water is abstracted to meet a wide range of uses including provision of water for public drinking water supply, industrial use, use in the food and drink industry, hydropower generation, agricultural and agri-industry use, recreational use and for use in fisheries.

Infrastructure related to abstractions include impoundments (e.g. reservoirs for the provision of drinking water), weirs and barriers and can lead to physical alterations of the water environment. The presence of hydro-electric schemes, fish farms and other non-consumptive users of water can also result in de-watering of river stretches leading to a lack of habitat continuity and limited access to spawning/nursery habitat, particularly for anadromous fish (salmon).

The morphology (channel form and sinuosity) of many rivers has been fundamentally altered by historic drainage, realignment and canalisation works in previous decades. Other man-made, in-stream structures (weirs, culverts, bridge aprons, fords etc.) may result in reduced habitat connectivity due to changes in water depth, wetted channel width and flow velocity. In-stream structures act as physical barriers to fish migration and reduce the carrying capacity of catchments. River stretches immediately downstream of impounding reservoirs can exhibit much lower flow than would be expected under natural conditions. This significantly reduced flow may impact on ecology and fish migration due to lack of river continuity and formation of isolated pools. However, there is evidence that such severe complete de-watering soon recovers and in most cases, water-bodies only exhibit this dry/pooling impact for a relatively short proportion of their length.

Groundwater is an important and valuable resource of freshwater often providing drinking water in rural areas through private boreholes. Groundwater is also important for maintaining flow and levels in rivers, lakes, dependent wetlands and transitional water bodies as the water bodies are hydraulically connected. Groundwater also supplies a number of agri-food processors with process water and it is therefore important to protect this natural asset from contamination and over abstraction.

Over-abstraction of groundwater in coastal areas or poor installation of boreholes in coastal groundwater bodies can lead to the ingress of saline water into freshwater

boreholes. This process is called saline intrusion and can result in a potable water supply becoming unsuitable for the provision of drinking water.

When resources are not used sustainably or environmental processes are not understood completely (e.g. an incorrect or incomplete conceptual model of what is happening at the site is used) the use of water resources can cause problems.

What are we already doing about this?

- Regulation of Surface Water and Groundwater - NIEA regulates surface water and groundwater abstractions and impoundments through the Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland 2006), as amended. Abstraction and Impoundment Licences include a range of conditions to limit the quantity of water abstracted and to protect our natural resources.
 - Regulation of NIW Abstractions - NIW abstracts significant quantities of water for drinking water supply, resulting in impacts in the water environment with the construction of impoundments weirs and barriers.
 - Deemed Authorisations - There is a legacy of deemed abstraction authorisations since the introduction of the Abstraction and Impoundment Licensing Regulations in 2006 as amended. Deemed authorisations were granted at the time to facilitate existing operations where there was insufficient evidence to set any meaningful licence conditions. NIEA is currently addressing these Deemed Authorisations.
 - NIEA has drafted a Fish Farm Policy for abstraction and is working with colleagues in Aquaculture and Inland Fisheries to reach agreement on the development of a sustainable aquaculture industry which protects and enhances the water resource.
 - NIEA has a monitoring programme in place and is currently carrying out targeted monitoring to identify the scale and frequency of controlled releases and over-spills from upland impoundments to downstream river stretches to understand the operational impacts of the reservoirs on the HMWB. This will inform the selection of appropriate mitigation measures in the future.
- **Do you think these measures adequately address the impact of abstraction and the physical condition of the river?**
 - **If not, what additional measures would you like to see happening?**

3.5 Forestry

Forests and their management can affect the quantity and quality of water moving through catchments. Although providing many positive benefits, forests have the potential to negatively impact on the water environment. Whereas some potential impacts are related to legacy issues associated with the design and layout of new plantation forests in past decades, others are related to the management of forest operations, including timber harvesting, regeneration of felled areas, road maintenance, and, occasionally, chemical applications, whether as pesticides or fertiliser.

Many forest management practices can impact on the water environment as a result of soil and vegetation disturbance or through the alteration of the pathways of water movement. Poor forest management can diminish or reverse the benefits provided by forests and woodlands, contribute to local flooding and risk severe water pollution (e.g. by increasing sediment run-off and water turbidity). Although larger-scale forest operations generally pose the greatest risk, small-scale working can also cause significant water problems.

Guidance on designing forests and minimising potential impacts from forestry operations has been regularly reviewed since the publication of 'Forests and Water Guidelines' in 1988 by the (then) Forestry Commission. The UK governments' requirements for sustainable forest management are set out in the UK Forestry Standard 4th edition (2017)⁶. The current UKFS Guidelines on Forests and Water describe how to comply with the requirements in order to protect the water environment. They form the basis for assessing forest management activities to ensure that there are no detrimental effects on water, both within the forest and downstream. The UKFS promotes an integrated catchment management approach and lays particular emphasis on riparian buffer zones and their role in protecting water. Over time newly created buffer zones may be converted into wet woodland or open wetland habitat, which can form a very effective buffer for management activities on adjacent upslope areas.

⁶ www.gov.uk/government/publications/the-uk-forestry-standard

What are we currently doing to protect the water environment?

- Felling regulation was introduced under the Forestry Act (NI) 2010 to help protect existing woodland, and to promote good practice in managing woodland through the preparation of a felling management plan.
 - HRAs have an important role to play in the protection of Natura 2000 sites including Special Areas of Conservation (SAC) and Special Protection Areas (SPA), and form part of the forest regulations section of the forest plans for state managed forests.
 - Forestry Planning Areas will continue to provide the basis for maintaining forest plans that meet the specific management requirements of the Forest Service.
 - Network Contribution database provides a tool to reduce the risk of diffuse pollution in forested catchments determining 'High Contribution Areas' which are used by Forest Service to revise forest design plans, in accordance with UK Forestry Standard requirements and guidelines.
 - Implementing revised guidance on planning and managing forest operations. Detailed supplementary guidance to forest managers, practitioners, planners and supervisors has recently been made available in the form of a UK Practice Guide 'Managing Forest Operations to Protect the Water Environment'. Applying this guidance will help ensure that forest operations comply with the UK Forestry Standard Guidelines on Forests and Water, which are the primary source of information on the legal and good practice requirements.
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- **Do you think these measures adequately address the impact of forestry?**
 - **If not, what additional measures would you like to see happening?**

3.6 Chemicals

The WFD requires the monitoring of chemicals in the aquatic environment to enable the establishment of necessary controls and manage risk. Chemicals can impact on the aquatic ecosystem in the following ways:

- Aquatic life (fish, plants and invertebrates) from exposure to chemicals in our watercourses;
- Human health and higher wildlife predators from chemicals that may accumulate via the aquatic food chain; and
- Surface and groundwater sources where chemical contamination may compromise their on-going use to supply water for domestic or food production purposes.

Priority Substances are chemicals which have been identified as presenting a significant risk to the aquatic environment. NIEA carries out a comprehensive programme of monitoring of priority substances during each RBMP cycle as required by the WFD Regulations and this is reviewed at least every 4 years so that monitoring takes account of emerging risks posed by chemicals on the aquatic environment. NIEA also undertakes monitoring of a 'Watch List' for new/emerging chemicals including natural and synthetic steroids, macrolide antibiotics, neonicotinoid pesticides and insecticides. The NI data is combined as a UK return to the EU commission and assessments will determine if a chemical is de-prioritised or prioritised for inclusion in WFD as a priority substance.

From December 2018 cypermethrin, which was previously a Specific Pollutant, became a Priority Substance with a more stringent standard. Cypermethrin is an insecticide with a wide range of uses including the control of pests on a range of crops, as well as public and commercial buildings and homes, and also as a wood preservative and as a veterinary medicine to control, for example, lice and ticks on cattle and sheep. It is highly toxic to aquatic life, particularly to invertebrates such as insects and crustaceans, and some species of fish.

Early monitoring results are showing a number of detections of cypermethrin in Northern Ireland's surface waters and WWTWs effluents. In addition some Ubiquitous Persistent Bioaccumulative Toxic (uPBTs) chemicals, including Mercury in biota, will be reported for the first time in 2021 and we anticipate that additional

information will be given in the RBMP to provide further context on the existing uses, risks and impacts that these uPBTs may have on the aquatic environment.

DAERA manage chemicals in the water environment within the framework of a strategic approach to tackle risks from harmful chemicals derived from a variety of sources. Some chemicals are ubiquitous and are best managed at a national scale whereas others are particular to an activity and their management should be focused at a local scale. Many chemicals are banned from production and/or use but are persistent in the environment for long periods and continue to be monitored to demonstrate that existing controls are adequate and concentrations are decreasing. Managing chemicals will ensure that we minimise the impact on aquatic life and human uses of water and the flora and fauna that live in it. The pollution inventory is available on the website⁷

What are we currently doing?

- The Water Catchment Partnership is a working partnership between DAERA, UFU, NIW and CAFRE established to help address pesticide issues in the water environment, especially in Drinking Water Protected Areas.
 - NIEA chair an interdepartmental group which reports on priority substances, monitoring outcomes in NI's aquatic environment to raise awareness of potential environmental impacts and promote initiatives for control and management of chemicals.
 - NIEA has embarked on initial programmes in monitoring pharmaceutical contaminants in the aquatic environment including antibiotics, as an extension of the EU Watch List, WFD Regulations.
 - NIEA developed a trace organics screening methodology during 2019 which has been applied as an 'early warning' process to protect an SAC designated water body which is also a significant water resource for drinking water abstraction.
- **Do you think these measures adequately address the impact of chemicals?**
- **If not, what additional measures would you like to see happening?**

⁷ <https://www.daera-ni.gov.uk/publications/inventory-emissions-discharges-and-losses-substances-and-chemical-analysis-information>.

3.7 Non Native Invasive Species

Animals and plants that have been introduced to a place where they do not naturally occur are known as non-native invasive species (NNIS) or invasive alien species (IAS). Many of these do not cause problems, but some can become invasive as they upset the balance of the ecosystem because they may be bigger, faster growing or more aggressive than the native species. They may also have fewer natural predators to control numbers. The native species are often unable to compete and the invasive species take over causing serious problems for biodiversity and the economy.

As well as the direct impacts described above, NNIS can also have indirect impacts in the wider environment. For example, in riparian areas, excessive growth of these species can result in increased shading. Winter die back of these NNIS can also result in river bank instability and erosion which can lead to increased sedimentation in rivers and consequent silting up of fish spawning grounds and smothering of freshwater pearl mussels.

NNIS are not specifically mentioned in the WFD, however the Directive requires us to assess 'other significant anthropogenic impacts on the status of surface waters'. Invasive species such as Giant Hogweed, Japanese Knotweed and Himalayan Balsam can be found in a number of water bodies. Floating pennywort, parrots feather & curly waterweed are also present in NI waters and are all EU Species of Union Concern.

The detection of invasive species is part of routine surveillance and investigatory monitoring in marine surface waters. The risk of the introduction of new species to Northern Ireland's coastal waters particularly through the transport of shellfish species for aquaculture is widely recognised and the Department is already exercising its statutory powers to control further introductions through this route. For example, the DAERA Chief Fisheries Officer (Marine) took the decision to refuse the introduction of seed mussel from Morecambe Bay following the discovery of Chinese mitten crab (*Eriocheir sinensis*) in samples of seed mussel (*Mytilus edulis*) from the same area. This position is consistent with the Invasive Alien Species Strategy (Objective 1, Priority Action 1.6). This decision also applies to material proposed

from the Thames Estuary and other areas where there is an established presence of Chinese Mitten Crabs.

A range of NNIS have already arrived in NI marine waters. Those which have direct economic impact include:

- *Crepidula fornicata* (Common slipper limpet)
C. fornicata was first documented in Belfast Lough in 2009 and most likely arrived with consignments of mussels. Other possible pathways include; with consignments of oysters, on drifting materials or due to dispersal of larvae. *C. fornicata* has since been discovered in Carlingford Lough (2018).
- *Didemnum vexillum* (Carpet sea squirt)
 Introduced to Strangford Lough by the movement of infected material from a farm in Kent. Started on the hull of the Light Ship and spread to surrounding floats. Although there is some suppression due to the lower average water temperature of Strangford Lough, there is nonetheless, a significant risk to aquaculture and biodiversity.

What are we already doing about this?

- The Invasive Alien Species Strategy for Northern Ireland sets out the challenges faced by the ever increasing threat to our natural environment from IAS. Action on IAS occurs through different interventions – targeted eradication, awareness programs, local action groups and research and development.
- DAERA has recently consulted on a proposal for ‘Management measures for widely spread Invasive Alien Species (IAS) in Northern Ireland’⁸ during September 2019 which aims to reduce the impact that the 10 widely spread species have on native biodiversity and ecosystem services in Northern Ireland.

➤ **Do you think these measures adequately address the impact of NNIS?**

➤ **If not, what additional measures would you like to see happening?**

⁸ <https://www.daera-ni.gov.uk/consultations/consultation-management-measures-widely-spread-invasive-alien-species-ias-northern-ireland>

3.8 Fisheries

DAERA continues to monitor salmon stocks and only to permit harvesting where populations have exceeded their management targets consistently over a 5 year period. ADULT returns have been lower than expected in the rivers and we intend to look at these rivers in more details assessing smolt outputs and smolt survival from freshwater to the marine environment. The River Bush will become a focus area to carryout habitat improvements and to monitor the impact on smolt production as fish head out to sea.

What are we already doing about this?

As part of our commitment to the North Atlantic Salmon Conservation Organisation (NASCO) we have an agreed target to identify and assess barriers to fish in our 16 primary salmon rivers over the period 2019 – 2024. Where opportunities arise to improve habitat and remove or improve fish passage at barriers we will continue to do so. A study has been completed on fish passage assessment at a hydro site on the Bush and its potential to improve fish passage. Both Inland Fisheries and the NIEA Abstraction team continue to work closely on abstraction site issues using tagging studies to help understand specific issues at problem sites and to carry out a programme of inspections at hydro sites to ensure compliance with the Fisheries Act.

The key focus areas for DAERA Inland Fisheries over the duration of the next RBMP will be to continue to build an empirical evidence base from which to guide practical management action. A broad range of work is covered through the assigned work programme with AFBI to monitor fish population trends and habitat quality. DAERA Inland Fisheries will utilise this information to develop appropriate actions to maximise freshwater production for wild Atlantic salmon following NASCO principles and by achieving objectives as outlined in the NASCO Implementation Plan for Northern Ireland 2019 – 2024. The implementation plan outlines specific actions to identify, assess and improve barriers to fish migration and commits to the development of suitable habitat improvement measures. These sites will be selected based on where they will have the maximum benefit for Atlantic salmon and will incorporate an assessment of potential cross cutting benefits with WFD targets. Life cycle modelling approaches for Atlantic salmon, Brown trout, European eel and other

fish populations will facilitate “bottlenecks” to natural production to be identified and remedial action to be developed where appropriate.

Northern Ireland enjoys a high aquatic animal health status, due to natural factors such as its island location, temperate climate and low number of native species. It enjoys a higher health status than the rest of the UK, as it is free from many of the most serious aquatic animal diseases. Northern Ireland is currently recognised as being free from the major non exotic fish diseases such as Viral Haemorrhagic Septicaemia (VHS) and Koi Herpes Virus (KHV).

With regards to shellfish, Northern Ireland is recognised as being free from *Marteilia refringens* with the exception of two sea loughs. (Dundrum Bay and Belfast Lough). Northern Ireland is also free from the molluscan disease, *Bonamia ostreae*, except for Lough Foyle and Strangford Lough. Surveillance has been undertaken for White Spot disease. To date, there is no evidence of the presence of this virus in decapod crustacean stocks. Northern Ireland also has national controls for *Gyrodactylus salaris* (Gs), Spring Viraemia of Carp (SVC) and Bacterial Kidney Disease (BKD). We are recognised as being free from all three diseases.

The carrying capacity of some of our Loughs, particularly Carlingford Lough, is causing some concern. The most recent ecosystem model runs, undertaken by AFBI, indicate that the Mill Bay area of Carlingford Lough has already exceeded its ecological carrying capacity in terms of the indicative threshold for Chlorophyll a (Chl a) reduction for Carlingford Lough to ensure adequate availability for wild species.

Carrying capacity is however, only one of a number of factors considered by the Department when reviewing new aquaculture licence applications. Additional issues may include, but are not limited to, spatial planning, site access, leasing arrangements, stewardship, marine litter and built heritage.

- **Do you think these measures adequately address the impact on fish?**
- **If not, what additional measures would you like to see happening?**

3.9 Additional issues impacting the water environment

As well as the significant water management issues identified through our monitoring results and pressure analysis, there are a number of additional pressures which have the potential to become significant issues in our water environment. The section below provides more details on additional issues.

3.9.1 Waste & contaminated land

Land affected by contamination can present major threats to the environment and risks to human health. Land can become contaminated by a variety of activities and substances, from heavy metals to agricultural waste. Pollution of groundwater and surface waters can occur when there is seepage or leachate migrating from old waste disposal sites or from former industrial sites where the land is affected by contamination for example, former factories, petrol filling stations. Leachate can be associated with old landfills (including old unlined landfills), illegal waste deposits, flytipping, fuel laundering waste or depositing of wrong waste types in licensed facilities (i.e. wrong waste in the wrong place).

The potentially harmful properties of landfill leachates result from the presence of high levels of ammonia and suspended solids, dissolved solids, toxic compounds, immiscible organic chemicals, high chemical or biochemical oxygen demand, nutrients or microbiological contaminants. Some components of leachates are of concern due to their toxicity, bioaccumulation and persistence. Landfilled waste decays over a period of decades and therefore the pollution from leachate and gas continues to be emitted over a long period of time.

Soil and groundwater on contaminated sites can be impacted by a range of chemicals depending on the previous (industrial) processes taking place at the site. DoE (Department of Environment – Westminster) profiles provide a full listing of potential contaminants based on the former industrial land use and processes.

What are we already doing about this?

In Northern Ireland, waste is regulated through the Waste & Contaminated Land Order 1997, Waste Management Licensing Regulations (Northern Ireland) 2003, Pollution Prevention and Control Regulations (Northern Ireland) 2013 and any amendments to these legislative instruments.

In April 2019 DAERA issued a Practice Guide for the Redevelopment of Land Affected by Contamination⁹.

3.9.2 Anaerobic Digestion (AD) Plants

NIEA control emissions to the environment through the appropriate legislation in this case The Waste and Contaminated Land (NI) Order 1997; The Pollution Prevention and Control (Industrial Emissions) Regulations (NI) 2013 and The Water (Northern Ireland) Order 1999.

There are planning approvals in place for approximately 150 AD plants in NI. There are currently approximately 80 plants operating and NIEA have engaged with all of the operators to ensure that all necessary regulatory controls are in place including waste authorisations where required.

AD is a process which harnesses natural bacteria to treat biodegradable materials such as agricultural manure and slurry, food waste and sewage sludge. The AD process produces a methane rich biogas, which can be captured and used to generate electricity and heat. The digestate residue can be beneficially applied to farmland as fertiliser, or as a soil conditioner. NIEA supports the use of AD as a means of diverting biodegradable wastes from landfill, recovering value from them and reducing greenhouse gas emissions.

What are we already doing about this?

The spreading of digestate is regulated under the NAP Regulations. From 1 February 2020, anaerobic digestate and anaerobic digestate separated liquid must be spread using LESSE (low emission slurry spreading equipment). Where farms are applying digestate as fertilisation, records of nutrient content analysis must be retained. Farms importing digestate will need to prove there is a crop need through a soil analysis and have a fertilisation plan in place. Prior to field storage of anaerobic digestate fibre, NIEA must be notified. If the manure and slurry feedstock is mixed with other waste feedstocks, then the resultant digestate, unless it complies with the Anaerobic Digestate Quality Protocol, will be waste and subject to waste regulatory controls.

⁹ <https://www.daera-ni.gov.uk/publications/best-practice-guidance-documents>

3.9.3 Sediment

Sediment is an essential, integral and dynamic part of our water environment. However, where human activities interfere with sediment quantity or quality, sediment management becomes necessary. Sediment is one of the less well defined pressures. There is no in-river WFD sediment standard. Sediment pressures are assessed by a link to biological element failures, and we do not routinely monitor sediment run-off or in-river siltation. As a result there is limited data available. Sediment is also primarily a diffuse pressure and river walk evidence has highlighted that this can make sources more difficult to identify.

Sediment impacts range from damage to the health of aquatic ecosystems to poor water quality for abstraction in drinking water protected areas. The effects of siltation can impact Natura 2000 sites for example, through effects on salmon spawning sites, and may have a significant effect on room for water in the channel and consequently flood risk. Sediment can act as a source and transport contaminants that may be associated to sediment particles such as chemicals, nutrients and faecal indicator organisms. The amount of sediment delivered from the catchment to the water body, and the ability of the water body to move sediment along are crucial factors in determining how sediment is retained.

Too much fine sediment causes a range of problems, from damaging wildlife to increasing the costs of drinking water treatment and increased risk of flooding from silted up drains. Sediment has direct impacts, carrying other pollutants like nutrients, chemicals and faecal contamination into the water environment.

Tackling fine sediment not only tackles the direct effects of sediment, but also brings wider benefits, including reducing the risk of flooding. Fine sediment results from soil erosion, soil compaction (which increases run-off) and the erosion of riverbanks and road verges.

What are we already doing about this?

The quantity of sediment reaching the water environment is controlled through regulation of industrial and sewage discharges. In rural areas, land erosion, run-off and sediment movement is reduced through controls contained in water pollution legislation, agri-environment schemes and requirements under cross-compliance. In forested areas, compliance with the Forest and Water

Guidelines ensures that the risk of sediment pollution from forest management and practices is minimised. In addition, DfI Roads and Rivers advises that when maintenance work is being carried out in rivers, marginal vegetation should be retained to reduce sediment movement and improve ecological value.

3.9.4 Quarries & Mines

The draft Programme for Government (PfG) aims to ensure that our ambition for economic growth and social progress takes into account the impact on the environment and the depletion of our finite natural resources. More specifically, the Strategic Planning Policy Statement for Northern Ireland states that Minerals, including valuable minerals, are an important natural resource and their responsible exploitation is supported by government. The minerals industry makes an essential contribution to the economy and to our quality of life, providing primary minerals for construction, such as sand, gravel and crushed rock, and other uses, and is also a valued provider of jobs and employment, particularly in rural areas.

The Sustainable Development Strategy recognises that while it is important that we respect the limits of our natural resources and ensure a high level of protection and improvement of the quality of our environment, 'sustainable development' does not prevent us from using and capitalising on such resources. It states that an enduring successful economy will effectively use natural resources and contribute towards the protection of the environment.

However, while mineral developments can deliver significant economic benefits, there are also a number of negative aspects arising from this form of development. The effects of specific proposals can have significant adverse impacts on the environment and on the amenity and well-being of people living in proximity to operational sites. It is the responsibility of the planning system, and associated environmental authorisations, to address these negative aspects and where appropriate to support sustainable development but also to challenge development that is not deemed sustainable.

NIEA play a key role in this process and its primary purpose is to protect and enhance Northern Ireland's environment. This is the context within which NIEA will

review planning applications, and associated environmental authorisations, for new mineral developments.

3.9.5 Plastic Pollution

Marine litter pollution captured the attention of the general public following scenes in the BBC programme Blue Planet 2 in 2017. Marine litter is all synthetic or processed items or fragments that have been discarded or lost either directly into the coastal and marine environments or somehow transported from land to the sea. Rivers, effluents, wind and land run-off are all means for carrying litter to the coast. It is generally recognised that the majority of marine litter originates from land-based activities and uses, although sea-based sources are important in some regions.

In the European Union, 80 to 85 % of marine litter, measured as beach litter counts, is plastic. This trend is replicated in Northern Ireland. The Marine Litter Report 2018 which provides a summary of litter observed on 10 reference beaches notes that 78 % of the items found were made of plastic. Survey data is available from 2012. A Marine Online Assessment Tool is now available which details our progress towards achieving Good Environmental Status for the different components of the marine environment¹⁰.

What are we already doing about this?

The Northern Ireland Marine Litter Strategy (MLS) was published in 2013 and is helping deliver our input to achieving Good Environmental Status in terms of marine litter under the Marine Strategy Framework Directive (MSFD). The Strategy has a broad focus on addressing litter pollution including plastic pollution on the coast through preventing additional litter entering the marine environment. This is achieved through awareness raising measures, data collection (beach surveys used to report on MSFD commitments), the enforcement of statutory deterrents for littering and having appropriate coastal infrastructure in place. The Strategy also addresses litter pollution by measures aimed at removing litter from the coast primarily through beach cleans.

A number of measures have been brought forward under the auspices of the Strategy to address the problem of plastic litter pollution including Fishing for Litter

¹⁰ Information on marine litter can be found on <https://moat.cefas.co.uk/pressures-from-human-activities/marine-litter>

managed by the Northern Ireland Fishery Harbour Authority which encourages fishermen to land litter trawled up on their nets and the Live Here Love Here campaign.

- **Do you think these measures adequately address the impact of the pressures discussed under the additional issues section?**
- **If not, what additional measures would you like to see happening?**

3.10 Emerging Issues

There are always new/emerging issues on the horizon which need to be incorporated into monitoring programmes in order to establish a baseline. This will provide a better understanding of the potential impacts on the water environment and control measures that need to be considered. The section below provides more details on new/emerging issues.

3.10.1 Microplastic pollution

Microplastics are small pieces of plastic typically less than or equal to 5mm in any dimension which can transport chemical pollutants which may be already contained in the plastic or absorbed from the aquatic environment. Microplastics can be small particles of plastic such as pre-production plastic pellets (primary microplastics) or a product of the degradation of plastic into smaller pieces (secondary microplastics)

Why is this a significant issue?

Microplastics can be eaten by a wide range of aquatic animals. Harm may be caused by the plastics themselves and/or by the chemical contaminants they transport into the animal's digestive system. Ingestion of microplastics can reduce digestion of food and adversely affect reproduction of aquatic animals. Microplastics can also be passed along aquatic food chains.

What are we already doing about this?

In terms of legislation, Northern Ireland banned the manufacture and sale of rinse off cosmetic products in 2019 through the Environmental Protection (Microbeads) Regulations (Northern Ireland) 2019. Plastic microbeads from rinse-off cosmetic products can pass through sewage treatment works, reach the aquatic environment and cannot be removed. The legislation is similar to that introduced in other areas of the UK.

NIEA WMU have commissioned research through the DAERA Evidence & Innovation (E&I) PhD programme. The project is entitled 'The distribution, abundance and impacts of plastic pollution in Northern Ireland's freshwater ecosystems' and commenced in October 2019 at the Institute for Global Food Security, Queens University Belfast.

NIEA's Chemistry Group is a member of the UK Chemistry Task Team (UKCTT). The team includes Defra and the 4 UK Environment Agencies and as such is a key

mechanism in the development of chemicals monitoring policy including microplastics in the UK. UKCTT is currently reviewing the publication of research undertaken by the Centre for Ecology & Hydrology commissioned by UK Water Industry Research (UKWIR). The research 'Sink to River – River to Tap' reviews the potential risks from nanoparticles and microplastics published June 2019. ¹¹

3.10.2 Antimicrobial Resistance (AMR)

The emergence and spread of drug resistant microbes is driven by over and inappropriate use of antimicrobials (particularly antibiotics) in both humans and animals. Highly resistant bacteria and antibiotic residues are found in bathing water, streams and slurry. Taking action to reduce the need for or misuse of antibiotics will lead to the improvement in our water environment as well as the overall health status. NIEA has embarked on initial programmes in monitoring pharmaceutical contaminants in the aquatic environment including antibiotics, as an extension of the EU Watch List, WFD Regulations. This work links to NI's action plan in tackling antimicrobial resistance in the province with NIEA expanding baseline monitoring activities to provide a better understanding of potential risks to the environment and human health. A number of pharmaceuticals were also included in water body monitoring suites during the 2nd cycle of river basin management priority substances monitoring. This initiative, as an early action has augmented baseline knowledge on these 'emerging chemicals'. This has allowed early engagement with policy and regulatory teams in NIEA as measures for control are considered.

3.10.3 Cypermethrin

From December 2018 cypermethrin, which was previously a Specific Pollutant, became a Priority Substance with a more stringent standard. Cypermethrin is an insecticide with a wide range of uses including the control of pests on a range of crops, as well as public and commercial buildings and homes, and also as a wood preservative and as a veterinary medicine to control, for example, lice and ticks on cattle and sheep. It is highly toxic to aquatic life, particularly to invertebrates such as insects and crustaceans, and some species of fish. Early monitoring results are showing a number of detections of cypermethrin in Northern Ireland's surface waters and WWTWs effluents. NIEA will continue to carry out a comprehensive programme

¹¹ <https://www.ukwir.org/sink-to-river-river-to-tap-review-of-potential-risks-from-microplastics>

of monitoring of priority substances and undertake periodic reviews of the Watch List to determine whether new/emerging contaminants pose an environmental risk.

3.10.4 Climate change in Northern Ireland

In Northern Ireland, disruption to business, services and people's daily lives will increase if adverse changes occur. An increased risk of flooding and coastal wear will put pressure on drainage, sewage, roads, water and habitats. Increased temperature, increased pollution and poorer air quality may bring discomfort to the vulnerable and threaten species of animals and crops.

In Northern Ireland, the main sources of greenhouse gas emissions are:

- agriculture (27 %) - for example methane releases from livestock and manure, and other gases from chemical fertilisers
- transport (23 %) – there is a reliance on road use in Northern Ireland
- energy (17 %) - the use of fuel to generate energy (excluding transport)
- residential use of fuel (13 %) - the energy used in your home (the main use is heating)

Other things in people's homes contribute to climate change indirectly. Everything, from furniture to computers, from clothes to carpets, uses energy when it is produced and transported – and this causes emissions to be released. Reusing and recycling instead of throwing items away will mean less waste and less energy needed to make new items.

Preparing for climate change

UK climate change projections, published in 2018 (UKCP18), set out a range of possible outcomes over the next century, based on different rates of greenhouse gas emissions into the atmosphere. UKCP18 projects greater chance of hotter, drier summers and warmer, wetter winters with more extreme weather and rising sea levels. The highest predicted releases for Northern Ireland show that by:

- 2070 winters could be up to 3.9°C warmer and summers could be up to 4.9°C hotter
- 2070 winters could be 25 per cent wetter and summers 38 per cent drier
- 2100 sea levels in Belfast could rise by up to 94cms

Potential impacts of climate change scenarios with drier summers and increased winter rainfall will result in water resource poor “hotspots”, more frequent flood events and more frequent prolonged low flow events or droughts. These signs are becoming more evident in Northern Ireland. In August 2017, the North West was significantly impacted by severe flooding which was as a direct result of very heavy and persistent rainfall when 60-70 mm of rain, equivalent to 63 % of the average August rainfall, fell in the space of 8-9 hours causing many watercourses to rise in some areas, to unprecedented levels in a very short period of time. This caused flooding to approximately 400 homes, numerous businesses and impacted significant areas of agricultural land. There was also significant damage to infrastructure with 210 roads either closed or impacted and 89 bridges requiring remedial action as a result of the flooding. Flood defences also suffered widespread impacts with a total of 2900 metres damaged in numerous locations across the North West.

DAERA provided funding to the Loughs Agency to enable remedial works to be undertaken in the areas worst affected. Where an immediate fishery interest was identified, Loughs Agency carried out works to protect salmonid habitats. Climate change could lead to these flood events occurring on a more regular basis.

- **Do you think these measures adequately address the impact of the emerging issues?**
- **If not, what additional measures would you like to see happening?**



Chapter 4: Working Together

4.1 River Basin Districts & Cross Border Cooperation

The 1st cycle plans were developed in co-ordination with the relevant authorities in Ireland and as a result all the water environments in Northern Ireland plus those shared with Ireland were assessed in unison. The 2nd cycle plans for Northern Ireland and Ireland were produced under differing timelines, however coordination still occurs in terms of the implementation of the plans, specifically with respect to setting objectives and identifying measures. Coordination will continue during the development and implementation of the 3rd cycle plans through various working groups which form part of the WFD Governance structure and NIEA are represented at each of these Governance groups.

The National Technical Implementation Group (NTIG) oversees technical implementation of the RBMP at a national level and provides a forum to ensure co-ordinated actions among all relevant State actors. It also addresses any operational barriers to implementation that may arise. The group is chaired by the Environmental Protection Agency (EPA), and membership includes the local authorities, the Office of Public Works (OPW), the Inland Fisheries Ireland (IFI), Teagasc, the Department of Agriculture, Food and the Marine (DAFM), Irish Water, the Department of Housing, planning & Local Government (DHPLG), the Forest Service, Coillte, National Parks & Wildlife Service (NPWS) and other implementing bodies, as appropriate. The NTIG review progress on an on-going basis, providing the National Coordination and Management Committee (NCMC) with updates on the implementation and effectiveness of measures.

The NCMC brings together chairs of the regional committees with the DHPLG and EPA and provides a forum for information exchange and for promoting the consistency of regional implementation. As the body that is statutorily responsible for reporting on the WFD, the EPA co-ordinate ongoing tracking of the implementation of actions and, in conjunction with others and by means of the monitoring programme, undertake assessment of the effectiveness of those actions.

The Border Region Operational Committee provides a forum to enhance interagency networking, develop relationships and work together to help achieve objectives of the

WFD Directive to benefit both the local community and the environment. In terms of cross border catchments this committee provides an opportunity for operational staff to share knowledge and experience and seek opportunities to maximise outcomes for cross-border Rivers.

The North West Water Forum is chaired by Donegal County Council and attendees include Lough's Agency, Local Authorities Water programme (LAWPRO), Source to Tap, NIEA, Inland Fisheries Ireland, Catchment Care, Teagasc, Coillte and NPWS. It is a cross-border interdepartmental meeting which aims to discuss emerging issues, existing projects, and share information and help build better working relationships within interested groups on either side of the Donegal border.

The North South Rivers and Lakes Group is a technical group that covers the detail of all our freshwater monitoring, classification and reporting in shared water bodies as required under the EC Water Framework Directive. It includes attendees from EPA, NIEA, AFBI, Loughs Agency and Inland Fisheries Ireland. The key purpose of the group is to ensure proper alignment and consistent reporting for the classification of cross-border water bodies (about 70 in all).

There are a number of cross-border projects ongoing which focus on delivering water quality improvements on water bodies on the border. The INTERREG VA Programme¹² has been designed to help overcome the issues that arise from the existence of a border. These issues range from access to transport, health and social care services, environmental issues and enterprise development. In total 85 % of the Programme, representing €240m is provided through the European Regional Development Fund (ERDF). The remaining €43m, representing 15 % is match-funded by the Irish Government and the Northern Ireland Executive. The content of the new INTERREG VA Programme has been agreed by the Northern Ireland Executive, the Irish Government, the Scottish Government and the European Commission. NIEA and the EPA work closely on the projects below through representation at Steering Group meetings and Advisory Committees. Further details of the INTERREG projects and a number of initiatives that are delivered through the collaboration of a range of Government Departments, Councils, Community groups

¹² www.seupb.eu/iva-overview

& local stakeholders can be found in Appendix 6. Appendix 7 contains a variety of data hubs to promote the sharing of data and information.



Lough Island Reavy

Chapter 5: Consultation Questions

We would like you to respond to the following questions:

1. What do you consider to be the most significant issues affecting the water environment?
2. Are you aware of any other issues in addition to the significant issues identified in the report?
3. Do you agree with our assessment of the significant water management issues?
4. Do you think existing measures are adequate for addressing the significant water management issues?
5. Do you have any other suggestions for how to address the significant issues highlighted?
6. What other actions do you think could be put in place to reduce the pollution of waters caused by nutrient enrichment?
7. What extra data would you like to see collected? What additional monitoring and evaluation would you like to see?

Please indicate in your response if it refers to the whole of the Northern Ireland or one river basin district in particular.

This consultation is open until 22 June 2020. You can respond by:

- e-mail to catchmentplanning@daera-ni.gov.uk or
- sending a written response to:

Integrated Catchment Planning
NIEA Water Management Unit
17 Antrim Road
Tonagh
Lisburn, BT28 3AL

Before you submit your responses please read the “Freedom of Information Act 2000 - Confidentiality of Consultation Responses” section below, which gives guidance on the legal position. If you require any further information, contact Lisa Frazer on 028 9056 9497.

Freedom of Information Act 2000

- Confidentiality of Consultations

The Department will publish a summary of responses following completion of the consultation process. Your response, and all other responses to the consultation, may be disclosed on request. The Department can refuse to disclose information only in exceptional circumstances. Before you submit your response, please read the paragraphs below on the confidentiality of consultations and they will give you guidance on the legal position about any information given by you in response to this consultation.

The Freedom of Information Act 2000 gives the public a right of access to any information held by a public authority (the Department in this case). This right of access to information includes information provided in response to a consultation. The Department cannot automatically consider as confidential information supplied to it in response to a consultation. However, it does have the responsibility to decide whether any information provided by you in response to this consultation, including information about your identity, should be made public or treated as confidential.

This means that information provided by you in response to the consultation is unlikely to be treated as confidential, except in very particular circumstances.

The Lord Chancellor's Code of Practice on the Freedom of Information Act provides that:

- the Department should only accept information from third parties in confidence if it is necessary to obtain that information in connection with the exercise of any of the Department's functions and it would not otherwise be provided;
- the Department should not agree to hold information received from third parties 'in confidence' which is not confidential in nature;
- acceptance by the Department of confidentiality provisions must be for good reasons, capable of being justified to the Information Commissioner.

For further information about confidentiality of responses, please contact the Information Commissioner's Office

Tel: (028) 9027 8757

Email: ni@ico.org.uk

Website: <https://ico.org.uk/>

GLOSSARY

- AFBI: Agri-Food and Biosciences Institute
- ARMI: Anglers Riverfly Monitoring Initiative
- BCC: Belfast City Council
- CAFRE: College of Agriculture, Food & Rural enterprise
- DAFM: Department of Agriculture, Food and the Marine; Ireland
- DAERA: Department for Agriculture, Environment and Rural Affairs
- DfI: Department for Infrastructure
- DHPLG: Department of Housing, Planning and Local Government; Ireland
- DIN: Dissolved inorganic nitrogen
- DoF: Department for Finance
- EMFG: Environment Marine and Fisheries Group
- EPA: Environmental Protection Agency; Ireland
- ERDF: European Regional Funding
- GSNI: Geological Survey of Northern Ireland
- IFI: inland Fisheries Ireland
- KAS: Knowledge Advisory Service
- KTM: Key Target Measures
- LAWPRO: Local Authority Waters Programme; Ireland
- LWWP: Living with Water Programme
- LTWS: Long Term Water Strategy
- NBRBD: Neagh Bann International River Basin District
- NCMC: National Coordination and Management Committee
- NERBD: North Eastern River Basin District
- NI: Northern Ireland
- NICS: Northern Ireland Civil Service
- NIEA: Northern Ireland Environment Agency
- NIW: Northern Ireland Water
- NPWS: National Parks and Wildlife Service; Ireland
- NWRBD: North West International River Basin District
- NTIG: National Technical Implementation Group
- OPW: Office of Public Works; Ireland
- PfG: Programme for Government
- PAH: Polycyclic aromatic hydrocarbon
- POM: Programme of Measures
- RBMP: River Basin Management Plan
- SCAMP: Sustainable Catchment Area Management Plan
- SDIP: Strategic Drainage Infrastructure Plan
- SIB: Strategic Investment Board
- SRP: Soluble reactive phosphorus
- SWMI: Significant Water Management Issues
- UFU: Ulster Farmers Union
- WFD: Water Framework Directive

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