Implementing the Water Environment and Water Services (Scotland) Act 2003:

Assessing Scotland's water environment – use of environmental standards, condition limits and classification schemes

Policy Statement

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The Scottish Government
Riaghaltas na h-Alba

FOREWORD

The Water Framework Directive (WFD) is a driving force behind the management of Scotland's water environment. We need to ensure that water use is sustainable, for this and future generations.

To help us do this, we need to define the **environmental standards** necessary to secure healthy aquatic ecosystems. We introduced a first set of such standards to underpin the first cycle of river basin management planning. These were published in Directions issued to SEPA in 2009. We have now issued new Standards Directions to SEPA replacing those published in 2009 and incorporating an updated package of standards. The updated package reflects developments in scientific understanding that have been made since 2009:

- The Scotland River Basin District (Standards) Directions 2014
- The Solway Tweed River Basin District (Standards) (Scotland) Directions 2014

One of the key uses of the standards is to underpin the **classification schemes** needed to assess the state of our aquatic environment. Classification shows us where the status of the water environment is good, and where it requires improvement. This helps us identify and prioritise where improvements may be needed, and will in turn help us to assess how our water bodies have benefited from those improvements. The first set of classification schemes were published in Classification Directions to SEPA in 2009. We have issued revised Directions (now called 'Status Directions') incorporating the changes needed to take account of the updated and expanded set of environmental standards:

- The Scotland River Basin District (Status) Directions 2014
- The Solway Tweed River Basin District (Status) (Scotland) Directions 2014

To support the 2009 Directions we published a **policy statement** on 'Assessing Scotland's water environment – use of environmental standards, condition limits and classification schemes'. **This updated policy statement replaces the 2010 document.**

This policy statement and the associated Standards and Status Directions are intended to provide stakeholders with a better understanding of our approach to the protection of the water environment through the Water Environment and Water Services (Scotland) Act 2003, which implements the Water Framework Directive and its daughter Directives, Priority Substances Directive (2008/105/EC) and Groundwater Directive (2006/118/EC)**.**

To complement these documents, our policy statement on "Principles for setting objectives for the River Basin Management Plan" describes our approach to setting **environmental objectives** for the water environment.

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SECTION 1 INTRODUCTION

1.1 Purpose

The aims of this policy statement are two-fold:

- to provide information on the principles underpinning the **environmental standards and condition limits**, and outline the Scottish Government's policy on how these are expected to be used by SEPA and other regulators to protect, and where necessary to improve, our water environment;

- to describe our approach to **classifying the status of our water environment**, using these environmental standards.

Scotland's water environment is in a relatively good condition compared with that of many European countries. However, our water environment is under pressure, with around 33% of Scotland's water bodies currently identified as not meeting good status. We need to protect the quality of the waters we have, and, where necessary and practicable, improve the status of those that are under pressure. In doing so, the Scottish Government's key aim is to strike the right balance between **protecting and improving the water environment and supporting the social and economic needs of those who depend on it.** Through the Water Environment and Water Services (Scotland) Act 2003 (the WEWS Act), and its supporting legislation, we now have in place an integrated legislative framework to help deliver that aim.

GENERAL PURPOSE OF ENVIRONMENTAL STANDARDS

The key mechanism for delivering improvements to the water environment is the river basin management planning process. This process relies on the use of environmental standards and condition limits to help us assess risks to the ecological quality of our water environment and to identify the scale of improvements needed to bring those waters not in good condition back to good health.

The standards underpin our efforts to protect and, where necessary, improve the water environment by informing decisions made by regulators on the controls required for activities that could adversely affect the water environment. They also help us identify what is needed to support the achievement of 'good ecological status' – and so inform the setting of environmental objectives in the river basin management planning process. It is therefore important that the standards are based on sound science and set at levels which protect the varying needs of Scotland's aquatic ecosystems; and reviewed over time in the light of new scientific evidence.

1.2 Environmental standards relating to the water environment

The WFD is much broader in scope than previous EU environmental legislation. Whereas earlier EU legislation tended to focus on the chemical quality of waters, the WFD's focus is on **ecological** quality. It sets out a wide range of parameters for which Member States must establish environmental standards for the purpose of protecting the

ecological health of their waters. The river basin planning framework established by the WFD also encompasses a series of protected areas, including for drinking water, bathing and economically important species of shellfish.

The 2014 Status Directions set out our scheme for assessing the condition of drinking water protected areas. Standards for assessing the condition of Bathing Waters are defined in the Bathing Waters Directive. We have issued separate Directions setting out standards that apply to Shellfish Waters designated under the 2013 Shellfish Regulations. Two daughter Directives also fit within the framework established by the WFD:

- The Priority Substances Directive 2008 introduces standards in respect of priority substances and certain other pollutants. These standards are included in the 2014 Standards Directions.

- The Groundwater Directive 2006 requires us to introduce the measures necessary to prevent inputs into groundwater of any hazardous substances; and limit inputs of other pollutants so that they do not cause deterioration of groundwater. SEPA currently uses standards developed for the purposes of an earlier Groundwater Directive, and for the time being, we expect SEPA to continue to use those standards when carrying out its regulatory functions and when providing advice to other regulators, such as local authorities. Further scientific work is underway and we expect UKTAG to come forward with updated recommendations on groundwater protection. Once we have considered these recommendations, we plan to include a set of standards for protecting groundwater from pollutant inputs in the Standards Directions.

1.3 Using environmental standards in River Basin Management Planning

Environmental standards have a number of roles in the RBMP process. They form the basis of the **monitoring** programmes used in **classifying** the state of the water environment. Those same standards enable consistent **objective-setting** within the river basin management planning process. Delivery of those objectives will largely be achieved through the effective **regulation** of activities affecting the water environment, by the application of those environmental standards via mechanisms such as CAR, restoration notices and marine licensing. These various roles are discussed in more detail below.

- **Monitoring**

SEPA established a new risk-based monitoring network in December 2006. The network ensures that we have appropriate monitoring sites in place to adequately assess the state of the water environment. The bulk of SEPA's monitoring effort is targeted on those water bodies that are at risk of failing to meet good ecological status. Information provided by monitoring or other sources may indicate that an environmental standard could be too stringent or too lax. Where this is the case, we expect SEPA to coordinate a review of that standard and, if appropriate, to come forward with proposals for revisions. Revisions to environmental standards will be subject to consultation and Ministerial approval, and will be taken into account during further updates of the River Basin Management Plans every 6 years.

- **Classification of the water environment under the WFD**

Classification of the status of surface water bodies provides a means of describing the extent to which their ecological quality has been affected by human activity. The WFD also requires us to classify the status of all bodies of groundwater. The results of classification enable us to identify where further monitoring may be required to improve understanding of the water environment and where we need to make improvements in order to achieve our objectives. The various components of the classification process are discussed in detail in section 3 of this policy statement.

- **Objective setting and River Basin Management Plans**

River basin management planning is a process of water resource management in river basin districts. It was introduced for the first time by the WFD and the WEWS Act. The process involves defining specific environmental objectives for each water body and identifying and implementing a programme of measures to deliver those objectives. Objectives are set in accordance with the Water Environment (River Basin Management Planning: Further Provision) (Scotland) Regulations 2013. The Scottish Government's policy statement on "Principles for setting objectives for the River Basin Management Plan" provides further information on this process.

Environmental standards underpin the objective-setting process. They are fundamental in assessing risks to the status of the water environment and highlighting where action is needed, either to prevent deterioration or to achieve good status. The effectiveness of the programmes of measures is evaluated through ongoing assessments of the ecological and chemical status of each water body.

- **Regulation - CAR, restoration and marine licensing**

Since 1 April 2006, activities in Scotland which pose a risk to the water environment, including abstractions, impoundments, discharges and engineering works in freshwater, must be authorised under CAR. SEPA uses the environmental standards to assess the capacity of the water environment to accommodate proposed activities without harming its ecological quality and to set conditions of authorisation in CAR licences for those activities. This regulatory activity protects the water environment and balances the interests of its users as well as contributing to achieving our environmental objectives.

The morphological condition limits also guide any physical restoration activity required to meet the objectives of the RBMP. Among other things, the second phase of environmental standards in 2009 introduced morphological conditions for coastal waters and estuaries. In the course of its regulatory functions in the marine environment the Scottish Government will utilise these condition limits to protect such waters.

SECTION 2 ENVIRONMENTAL STANDARDS

2.1 Overview

Environmental standards and condition limits are key to the protection of our water environment and the achievement of our WFD objectives. They underpin assessments of whether waters are at risk of deterioration and what improvements would be needed to improve the status of waters that are not at good status.

The main work of developing environmental standards for use in the UK has been carried out by the UK Technical Advisory Group for the WFD (UKTAG). This is a partnership of technical experts from the UK environmental protection and conservation agencies, as well as representatives from the Republic of Ireland. UKTAG is responsible for developing recommendations for standards and presenting these to the UK Administrations for consideration.

For surface waters, environmental standards have been identified for:

- **water plants and animals indicative of the ecological quality of surface waters**
  These biological standards help assess the extent to which the composition and abundance of water plant and animal communities has been affected by human activities. Such information enables us to identify where action is most needed to improve ecological quality and whether remedial action has been successful.

  The scientific work to develop biological standards that are reflective of the impact of some pressures (e.g. abstraction and engineering works) is still on-going. Progress has been made and we have now been able to introduce some ecological methods for assessing the impact of abstraction. We expect further standards to be progressively introduced as the necessary scientific work is completed.

Biological standards do not tell us what level of action is required to improve the status of our surface waters (e.g. by how much an abstraction or discharge would have to be reduced to enable the achievement of good status) or the risk posed by development proposals (eg proposals to increase abstractions or discharges). For this, standards for the following are needed:

- **general chemical and physicochemical condition of surface waters**
  This includes standards for oxygen levels, acidity, temperature and nutrient concentrations. Together with the standards for toxic pollutants outlined below, they help assess whether water quality is of a sufficiently high standard to safeguard the ecological quality of surface waters.

- **toxic pollutants in surface waters**
  Environmental standards have been set for:
    - priority substances and certain other pollutants identified at EU-level;
    - other specific pollutants identified at UK level.

  Specific pollutants are toxic pollutants being discharged into surface waters in quantities significant enough to pose a risk to the ecological quality of those waters. We have introduced standards for 26 such pollutants. Further pollutants may be

identified in future river basin planning cycles. Pollutants may also be removed from the list of specific pollutants if they cease to be discharged in significant quantities.

- **water flows and levels in surface waters**
  The ecological quality of our surface waters depends on the maintenance of the conditions necessary for healthy water plants and animal communities. These standards are used in assessing whether the right water flow and level conditions are present and whether proposed changes (e.g. additional water abstraction) would pose a risk to ecological quality.

- **the condition of bed, banks and shores (i.e. morphological conditions) of surface waters and the continuity of rivers for fish migration**
  These standards are used to assess the ecological risk posed by any alterations (e.g. as a result of engineering works) to the beds, banks or shores of surface waters.

Many of the standards for surface water vary from one part of the water environment to another. This reflects the natural variation in the characteristics of the different parts of the water environment and the associated differences in their ecological sensitivity to pressures.

For groundwater:

- **threshold values** have been identified for pollutants indicative of pressures placing bodies of groundwater at risk. Where a breach of a threshold value is identified, this acts as a trigger for investigations aimed at determining whether or not the conditions for good groundwater chemical status are being met (see section 3.4 for further details).

- **environmental standards** are used in controlling inputs of pollutants into groundwater in order to:

  - protect surface waters associated with the groundwater and wetlands dependent on groundwater from pollution;
  - avoid deterioration of the quality of groundwater abstracted for human consumption;
  - safeguard the ability of groundwater to support human uses;
  - ensure (i.e. by protecting against the development of pollution hotspots) that pollutant inputs do not cumulatively cause deterioration of the status of any water body.

  The standards for protecting associated surface waters have been identified by UKTAG. We expect SEPA to use established drinking water standards to protect groundwater used for human consumption, safeguard the ability of groundwater to support human uses and avoid cumulative impacts on the status of groundwater bodies. These may include standards established under the Drinking Water Directive[1],

[1] See Directive 98/83/EC on the quality of water intended for human consumption; The Public Water Supply (Water Quality) (Scotland) Regulations 2014; and The Private Water Supplies (Scotland) Regulations 2006

in World Health Organisation (WHO) guidelines or by the United States Environmental Protection Agency.

HAZARDOUS SUBSTANCES

Whilst environmental standards underpin the way we manage the majority of pressures on the water environment, informing regulatory controls by identifying the quantities of particular pollutants that can be discharged into the water environment without causing harm, a different approach is required for certain **hazardous substances**. We have to stop them entering the water environment rather than just restricting their inputs in line with environmental standards.

The hazardous substances that we have to aim to prevent discharges, emissions and losses of into **surface water** are listed in the Priority Substances Directive (2008/105/EC).

SEPA has published a list of the hazardous substances that must be prevented from entering **groundwater** to achieve the objectives of the 2006 Groundwater Directive. The list comprises those pollutants previously identified as hazardous for purposes of the 1980 Groundwater Directive. The work to identify these substances was overseen by the Joint Agency Groundwater Directive Advisory Group, whose members are the UK environment agencies (including SEPA), the Department of Environment, Food and Rural Affairs (DEFRA), the Department of Health, and the Chemical Industry Association. The lists identified by this group have been subject to public consultation. Further details are available on the Environment Agency's website. The list will be updated as and when additional hazardous substances are identified. The scientific work to identify additional substances will continue to be coordinated at UK-level, and will be subject to consultation.

2.2 Phased introduction of environmental standards and condition limits

Environmental standards and condition limits have been introduced in phases. Further standards may be required as scientific knowledge increases, and as further data becomes available from monitoring and from work at a European level. This phased approach reflects our desire to ensure that all available scientific evidence is considered in developing the standards. Where an appropriate environmental standard has not yet been defined, SEPA will work with UKTAG to develop a standard and this will then be subject to consultation and Ministerial approval.

Equally, it is important that standards are proposed and introduced as early as possible where we have sufficient information and understanding. Timely introduction will give businesses and other water users sufficient time and certainty to plan for the future. As new standards are developed, there will be a phased transition from existing standards. SEPA manages that transition to ensure there is no deterioration in status of the water environment, whilst facilitating business and financial planning over the longer term.

SEPARATION OF SCIENCE AND POLICY

UKTAG's scientific recommendations are put forward to the UK administrations for Ministers to consider. This clear separation of science and policy has been adopted to emphasise that cost considerations should not influence the scientific development of standards; whilst recognising that the Directive allows flexibility to set less stringent objectives through the river basin management planning process where necessary on grounds of disproportionate costs or technical infeasibility.

2.3 Compatible approach across Europe

The environmental standards and condition limits introduced via the 2014 Standards Directions have been:

- set to reflect definitions of environmental quality specified in the WFD;
- developed in parallel with an EU exercise aimed at ensuring the biological standards Member States use in assessing good ecological status are comparable.

This EU exercise, known as inter-calibration, has been coordinated by the European Commission. Experts from Scotland and the rest of the UK have been, and continue to be, involved in the exercise.

2.4 How standards are used in Scotland

The RBMP and its associated legislation create a framework for SEPA and responsible authorities to follow in carrying out their functions. SEPA and the responsible authorities have a duty to protect the water environment but are also required to consider the social and economic impact of their actions, and to ensure that they act in the way best calculated to contribute to the achievement of the Scottish Government's strategic objectives including sustainable economic growth.

It is the responsibility of SEPA to regulate a wide range of activities that can adversely affect the water environment. Other regulators control certain activities that can have a significant impact on the water environment. For example, the Scottish Government is the competent authority for granting licences for engineering activities in coastal waters. All relevant regulators will be expected to adopt a similar approach to implementing the appropriate standards or condition limits in carrying out their regulatory functions.

Assessing current conditions against the environmental standards determines the available carrying capacity of the water environment to accommodate further activities or developments without significant risks to the quality of the aquatic ecosystem it supports. If, for instance, part of a river could accommodate some changes such as reduced water flow or alterations to the banks before an environmental standard or condition limit is breached, it still has available carrying capacity.

There are cases where more than one pressure contributes to an impact on the water environment. The most cost-effective combination of measures to address such impacts will be considered in implementing the programmes of measures identified in our river basin management plans. This issue is discussed in more detail in our policy statement on "Principles for setting objectives for the River Basin Management Plan".

2.5 Application of the standards in carrying out regulatory functions

For clarity and transparency, this paper sets out guiding principles for the application of water environment standards in Scotland. We expect SEPA and other regulators to have regard to these principles in their application of the environmental standards set out in the 2014 Standards Directions.

Guiding principles for applying environmental standards and condition limits in Scotland

SEPA and other regulators will normally be expected to use their powers to prevent a failure of an environmental standard or condition limit

This will include:

- refusing to grant applications to undertake controlled activities that would (individually or cumulatively) result in failure of an environmental standard or condition limit;
- granting authorisations subject to such conditions as they consider necessary to ensure controlled activities do not cause a failure of an environmental standard or condition limit; and
- taking enforcement action where necessary to secure compliance with authorisation conditions that have been set to ensure an environmental standard or condition limit is met.

Such action will help protect Scotland's water environment and the interests of other users of the water environment; and contribute to achieving the WFD's objectives of preventing deterioration of status of any water body.

SEPA and other regulators will be expected to use their powers to minimise the impacts of hazardous substances

This will include:

- requiring hazardous substances to be prevented from entering groundwater unless one or more of the conditions for exemption identified in the 2006 Groundwater Directive is met;
- contributing to the objective of aiming to cease or phase out discharges, emissions

and losses of priority hazardous substances.

Under certain circumstances, SEPA and other regulators may grant an application for authorisation even though they expect that the proposed activity will cause an environmental standard or condition limit to be failed

SEPA and other regulators are required to have regard to the social and economic costs and benefits of their regulatory decisions and will be expected to strike the right balance between the protection of the water environment and the social, economic and environmental benefits we gain from its sustainable use. This means that SEPA and other regulators may decide it is appropriate to authorise an activity which would cause a failure of environmental standard or condition limit where they consider the benefits to sustainable development, human health or human safety would outweigh the adverse social, economic and environmental consequences and provided the activity does not lead either directly or indirectly to increased pollution of surface waters.

Where the authorisation of a proposed activity would threaten the status of a water body, regulators may only grant authorisation if the WFD's provisions for exemption from its objective of preventing deterioration of status are satisfied, in line with the provisions of the Water Environment (River Basin Management Planning: Further Provision) (Scotland) Regulations 2013 Justification for any such exemption must be recorded and presented in the River Basin Management Plans.

SEPA and other regulators will normally be expected to grant authorisation for activities that would not individually or in combination with other pressures cause an environmental standard or condition limit to be failed

However regulators should be satisfied that granting such authorisations would not:

- result in the achievement of environmental objectives, including those for Protected Areas, being compromised;
- unnecessarily limit opportunities for future sustainable development by authorising inefficient use of the water environment; or
- have unacceptable adverse impacts on the interests of other users of the water environment

SEPA and other regulators will normally be expected to require action to improve the water environment only where they are confident that the condition of the water environment is such that there is a significant risk that an environmental objective will not be achieved

In assessing the condition of the water environment, SEPA and other regulators will:

- compare monitoring or modelling results against environmental standards and condition limits;
- assess the confidence of the result; and
- if no one piece of evidence provides sufficient confidence about the condition of the

water environment, consider the weight of all the available evidence including, in particular, ecological evidence of adverse impacts. Such evidence is particularly important in the case of failures of plant nutrient and river flow standards.

SEPA and other regulators are expected to ensure that any improvements they seek are also sufficient to:

- prevent the environmental standard subsequently being failed again as a result of fluctuations in environmental quality that cannot readily be controlled; and
- provide environmental capacity for future development by securing good environmental practice in terms of efficient and sustainable water use where development is currently constrained because of the lack of such capacity.

Environmental standards define the point at which the carrying capacity of the water environment is exceeded and hence at which there is a significant risk of adverse effects. Environmental carrying capacity is defined as the capacity of the water environment to accommodate changes resulting from human activities without significant risk to plants and animals it supports.

SEPA and other regulators will not normally require improvements for the purposes of achieving the WFD's objectives for the status of water bodies where making the necessary improvements would be technically infeasible or disproportionately expensive

Where an operator considers that making an improvement to the water environment would be disproportionately expensive or technically infeasible, the regulator will be expected to take into account information provided by the operator and interested third parties before determining whether to require that improvement and to explain the reasons for the determination.

2.6 Practical application of guiding principles

In applying the above principles in seeking improvements to the status of the water environment, Ministers expect the following steps to be applied:

- relevant regulators identify the activity or activities responsible for causing the significant adverse impacts on a water body;
- the regulator seeks the necessary improvements by encouraging or initiating a variation of the relevant authorisation or authorisations for the activity or activities, or issuing a remediation notice;
- where taking the necessary action to deliver the environmental improvements may be disproportionately expensive or technically infeasible:
    - the proposed variation or variations will be advertised to enable third parties to express their views on the case;
    - the regulator will confirm with the operator that the most cost-effective option for delivering the required environmental improvements has been considered; and

    - the regulator will determine whether the action necessary to deliver the environmental improvements would be disproportionately expensive or technically infeasible;
- if achieving a standard necessary to enable the achievement of good status standards by is determined to be disproportionately expensive or technically infeasible, the regulator should identify what improvements, if any, would be technically feasible and proportionate and over what timescale; and
- the regulator issues an appropriately varied authorisation for the activity or activities.

SECTION 3 CLASSIFICATION SCHEMES

3.1 Overview

In addition to the introduction of specific standards and condition limits, we need a mechanism for assessing and describing where the water environment is of good quality and where it may require improvement. Classification systems provide such a mechanism for describing the state of our aquatic environment and for assessing the effectiveness of our programme of measures in achieving the environmental objectives established in the river basin management plans.

This section describes the classification schemes and how they are being applied as part of the river basin management planning process, including:

- how the environmental standards and condition limits set out in the 2014 Standards Directions should be used for the purposes of classification;
- how SEPA should carry out an assessment of its confidence in the classification results; and
- how the results of the classification exercise should be presented and reported.

The classification schemes have been introduced, via Status Directions to SEPA, in respect of:

- surface water bodies (section 3.3)
- groundwater bodies (section 3.4)
- surface water bodies designated as heavily modified or artificial (section 3.5).

The application of these schemes has provided us with our most comprehensive assessment of the status of Scotland's water environment. Information on the results of classification is available on SEPA's website[2].

3.2 Using monitoring to inform classification

Each water body is classified by determining the impacts of the pressures to which it is subject using data collected by monitoring and, where relevant, the results of modelling.

As discussed at section 1.2, SEPA has established a risk-based monitoring programme and must continue to collect sufficient data to inform its classification decisions. SEPA is expected to provide information on its confidence in its classification (see section 5 below).

For the purposes of classification, SEPA may discount monitoring results which are influenced by one-off, unrepresentative and transient incidents, provided that the condition of each affected water body is adversely affected for only a short period of time (i.e. there is only a transient blip in the condition of the water body).

[2] http://www.sepa.org.uk/water/monitoring_and_classification/classification/classification_results.aspx

3.3 Classification of surface water bodies

The WFD requires each surface water body to be classified in terms of its ecological and chemical quality. For those water bodies not designated as heavily modified or artificial, this ecological quality is described in terms of 'ecological status'. This is an expression of the quality of the structure and functioning of surface water ecosystems as indicated by the condition of a number of 'quality elements'. The WFD uses the term 'quality elements' to refer to the different indicators of ecological quality making up its ecological status classification schemes.

There are five classes of ecological status, defined in terms of how much the ecological quality deviates from natural conditions. These are high, good, moderate, poor or bad. High status means that the water body is unaffected or virtually unaffected by human activity. A good status water body shows some signs of human pressures, such as slight alterations in the composition or abundance of water plant or animal communities (biological quality elements) compared with what would be expected in a water body at high status.

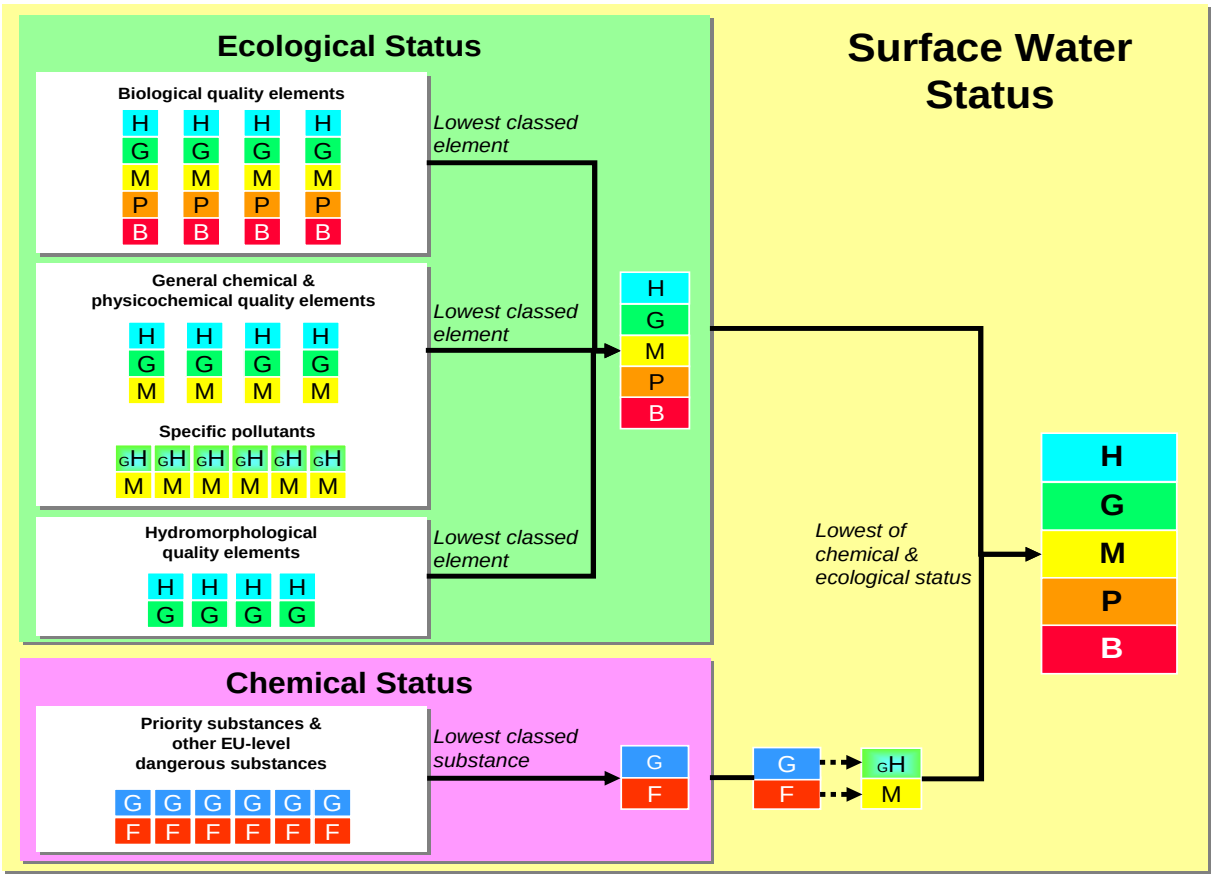
The quality elements used to assess ecological status are:

- biological quality elements (water plants and animals);
- chemical and physicochemical elements (eg oxygen and nutrient levels); and
- hydromorphological quality elements (water flows and levels; the condition of beds, banks and shores; and the continuity of rivers for fish migration).

For good status, the chemical, physicochemical and hydromorphological quality of the water body must achieve the standards and conditions necessary for the biological quality elements to be in good condition. The ecological status of a water body is determined by the lowest-classed quality element. This is called the '*one-out, all-out principle'*.

Chemical status is either 'good' or 'failing to achieve good'. 'Good' means that none of the environmental quality standards established for priority substances and other dangerous substances identified at EU-level is being exceeded.

Ecological status and chemical status are then combined to provide an assessment of overall surface water status. The following diagram illustrates how these various elements are combined and how the 'one-out, all-out' principle is applied.



The relevant quality elements for classifying a particular water body depend on whether the water body is a river, loch, estuary or coastal water body. Standards and condition limits define the class boundaries applicable to the different quality elements and these are set out in the 2014 Standards Directions.

Biological monitoring systems for measuring the ecological impact of abstractions, flow regulation and engineering works are still in the early stages of development. The 2014 Standards Directions have introduced a set of ecological indicators for the first time to help SEPA identify where water abstraction or flow regulation is causing major and severe ecological impacts in rivers. We have updated the Directions on classifying water bodies to ensure that evidence of such impacts is required before water bodies can be classified as poor or bad status. However, with this exception, we continue to expect SEPA to classify the ecological status of surface water bodies by comparing their hydromorphological conditions with the hydrological and morphological standards and condition limits set out in the 2014 Standards Directions. This will ensure the classification results reflect the best understanding possible of the ecological impacts of these pressures.

Future developments of the classification scheme

Work is being progressed by UKTAG on ecological assessment methods capable of measuring moderate impacts resulting from water abstractions as well as major and severe impacts. We expect these methods to become available within the next few years. Once they are, we will introduce them in place of the flow standards for the purposes of classifying waters as moderate.

In the meantime, the risk of moderate impacts on ecological quality will continue to be factored into classifications through the use of flow standards. Because of this, when improved ecological assessment methods start to be applied, it is more likely that the number of rivers classed as worse than good will stay the same or decrease rather than significantly increase.

Surface water status is determined by the poorer of ecological and chemical status; thus if ecological status is good but chemical status is failing to achieve good, then overall surface water status class is "moderate". SEPA must classify the overall status of each surface water body as high, good, moderate, poor or bad, in line with the diagram on Page 14; and taking into account the considerations described below. These matters are elaborated in more detail in the 2014 Status Directions.

- **Spatial considerations**

An important factor in assessing the status of a water body is the spatial extent of any adverse impact on a water body. Failures of environmental standards over a limited spatial extent in a water body, although causing ecological damage, will not individually be expected to affect the ecological status of the water body as a whole. In contrast, failures of standards that individually or cumulatively extend over a significant area or length of a water body will affect the body's ecological status and must be reflected in the classification results.

To ensure that classification results reflect impacts on the ecological quality of the water environment that are of sufficient spatial extent to affect ecological status, SEPA will apply the spatial environmental standards in the 2014 Standards Directions.

To do this, SEPA should aim to ensure that the monitoring data and modelling results it uses in classification are representative of the appropriate spatial extents of water bodies as set out in the 2014 Standards Directions.

- **Invasive non-native species assessment**

It is important to ensure that the impact of invasive non-native species is properly reflected in the classification process. Where significant adverse impacts are causing the ecological status of a water body to be moderate, poor or bad, we expect these to be reflected through the normal application of biological monitoring and assessment methods.

SEPA will take account of the impact of those ‘high impact’ species listed in the 2014 Status Directions. Where there is evidence that a listed species has become established over a significant spatial extent of a water body, SEPA will not classify the water body as being at high ecological status.

3.4 Classification of groundwater bodies

Protection of our groundwater resources is important to enable their continued use for public and private drinking water supplies, bottled water production and a range of other industrial uses. It is also important for our surface waters and wetlands which depend on the water that reaches them from groundwater.

For groundwater bodies, the approach to classification is different from that for surface water bodies. For each body of groundwater, we are required to classify its chemical status and its quantitative status. Both have to be classed as either 'good' or 'poor'.

Groundwater chemical status indicates whether or not:
(a) any pollutants in groundwater are causing:
- harm to surface waters into which the groundwater eventually flows;
- damage to wetlands that depend on the groundwater for their water needs;
- deterioration of the quality of water being abstracted (or planned to be abstracted) from the water body for human consumption;
- significant impairment (e.g. because of widespread pollution) of the ability of the groundwater body to support other uses;

(b) salty water at the coast or polluted water is being drawn into the body of groundwater to replace abstracted water

Groundwater quantitative status indicates whether or not any changes to groundwater flows and levels resulting from human activities, such as water abstraction, are causing:
- harm to surface waters that depend on groundwater flows during dry weather;
- damage to wetlands that depend on groundwater for their water needs;
- salty water at the coast or polluted water from neighbouring bodies of groundwater or surface water to be drawn into the body of groundwater; or
- groundwater levels to fall because (over the long-term) the rate of abstraction is greater than the rate at which groundwater is being replenished from rainfall.

The WFD sets out a series of criteria that must be met for a body to be classed as good chemical status and good quantitative status. These are further elaborated in the Groundwater Directive

To classify bodies of groundwater, SEPA has to assess whether or not the relevant criteria are met. To do so, it is expected to undertake appropriate investigations where there are indications of a risk that one or more of the criteria for good status may not be met. The indicators of risk that SEPA is expected to consider are described in the 2014 Status Directions. With respect to groundwater chemical status, they include a series of threshold values. These are set out in the 2014 Standards Directions.

The ‘one-out, all-out’ principle described in section 3.3 also applies to groundwater classification; thus overall groundwater status is determined by the lower of the groundwater chemical status and quantitative status classifications. SEPA will be expected to classify the overall groundwater status of each body of groundwater as 'good' or 'poor' accordingly. These matters are elaborated in more detail in the 2014 Status Directions to SEPA.

3.5 Identification of water bodies designated as heavily modified or artificial

In some cases, substantial modifications to the physical characteristics of surface water bodies have been made to accommodate uses like navigation, water storage, flood defence and land drainage. Such modifications may be preventing the bodies achieving good ecological status. Where this is so and the bodies cannot be restored to ‘good’ ecological status without significant adverse effects on those uses, the water bodies have been designated as heavily modified bodies (HMWBs). Man-made water bodies, such as canals, that have been created where no natural water body previously existed, have been designated as artificial water bodies. The principal objective for such water bodies is to aim to achieve good ecological ‘potential’ by 2015. Further details of this process are described in our Policy Statement, “Principles for setting objectives for the River Basin Management Plan”.

There are five classes of ecological potential. The classes are defined in terms of how much the ecological quality of such water bodies deviates from the best that could be achieved (i.e. the maximum ecological potential) without putting in place mitigation (relating to the impacts of the modified or artificial physical characteristics) that would have a significant adverse effect on the relevant use or on the wider environment.

For the purposes of determining whether a heavily modified water body is at good or maximum ecological potential, SEPA cannot simply apply the normal standards and condition limits for hydromorphological quality elements or biological indicators that are sensitive to hydromorphological alterations. This is because a failure of these standards and condition limits would not necessarily mean that a water body was failing to achieve good or even maximum ecological potential. Instead, if all mitigation that could be taken to address the adverse ecological effects of a body's modified or artificial characteristics has been taken, SEPA is expected to:

(a) classify the water body's hydromorphological characteristics as being sufficient to enable the achievement of good or maximum ecological potential; and
(b) provided no other pressures (e.g. pollution pressures) on the water body are causing a failure of any of the standards or condition limits for 'good', classify the water body is achieving good or maximum ecological potential.

The classification of the **ecological potential** of heavily modified and artificial water bodies requires identification and assessment of the following:

- the modifications and artificial characteristics of the water body concerned that are preventing the achievement of good ecological status;

- the mitigation measures already taken in relation to those characteristics and whether they adequately mitigate the identified impacts;
- whether additional mitigation measures could be put in place without significant adverse effects on the use, or on the wider environment.

Water bodies affected by hydropower schemes

To avoid a significant impact on renewable electricity generation, SEPA will aim to achieve good ecological potential in water bodies affected by hydropower schemes over the three river basin management planning cycles to 2027 without a reduction in generation of more than around 100 GWh.

Most of the other steps in the process are similar or identical to those described in section 3.3 above for classifying the **ecological status** of other surface water bodies. In determining the appropriate mitigation measures, we expect SEPA to take into account the relevant guidance on good ecological potential published by UKTAG[3,4]..

The classification of the **chemical status** of heavily modified and artificial water bodies follows the same process described in section 3.3 for other surface water bodies.

These matters are set out in more detail in the 2014 Status Directions.

[3] UKTAG (2008) Guidance on the classification of ecological potential of heavily modified and artificial water bodies
[4] UKTAG (2013) River flow for good ecological potential. Final recommendations.

SECTION 4 ACHIEVEMENT OF PROTECTED AREA OBJECTIVES

4.1 Overview

The river basin management planning process provides the framework for assessing whether we are achieving our objectives for 'protected areas'. These include areas designated under EU legislation or under the Shellfish Water Protected Areas Designation Order 2013 as requiring special protection. The areas include areas protected because they are important for recreational activities, such as bathing; because they support economically important shellfish species; or because they support habitats or species important for biodiversity conservation. Such designations are made by Ministers – current designations can be found under the Register of Protected Areas on SEPA's website.

Specific objectives and standards apply to protected areas. For some protected areas, the standards required to achieve their objectives are specified in the EU-legislation under which the areas were designated. For others, the standards required have been identified nationally. Information on where we are achieving the objectives and standards for our different protected areas is provided in the river basin management plans.

The process of assessing whether protected area standards and objectives are being achieved is a separate process to water body classification and made specifically in relation to any objectives a water body might have as a protected area. The different types of protected areas and the associated assessment requirements are summarised in the table below.

Different types of protected areas and their associated assessment requirements		
Protected Area	**Legislation under which designated**	**Assessment required**
Areas designated for the abstraction of water used or intended to be used for human consumption	Waters designated as used or intended to be used for human consumption under the Water Framework Directive	Whether achieving, or failing to achieve, the objective as described in Section 4.2 below
Areas designated for the protection of economically important shellfish species	Shellfish Water Protected Areas designated under the 2013 Order	Whether achieving, or failing to achieve, the objectives established in accordance with the 2013 regulations.
Bodies of water designated as recreational waters	Waters designated under the Revised Bathing Water Directives (2006/7/EC & 76/160/EEC)	Whether complying, or failing to comply, with the requirements of the relevant Directive

Nutrient-sensitive areas	Waters identified as polluted waters under the Nitrates Directive (91/676/EEC) or as sensitive areas under the Urban Waste Water Treatment (91/271/EEC)	Whether complying, or failing to comply, with the requirements of the relevant Directive
Areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection	Relevant Natura 2000 sites designated under the Habitats Directive (92/43/EEC) or the Birds Directive (79/409/EEC)	Whether meeting or failing to meet the water status-related needs of the site's biodiversity conservation objectives

4.2 Drinking water protected areas

Drinking water protected areas and their objectives were established specifically by the WFD. Consequently, we need to set out how SEPA is expected to assess whether or not the objectives for these areas are being achieved.

Drinking water protected areas are surface water bodies or groundwater bodies with totalled abstractions used or intended to be used for human consumption of greater than 10 cubic metres per day on average, or serving more than 50 people.

Drinking water protected areas have to comply with the requirements of Article 7 of the Water Framework Directive (WFD). Such areas will fail to meet these requirements if deterioration in their quality has compromised any supply or combination of supplies providing 10 cubic metres per day on average, or serving more than 50 people. In making that assessment SEPA will take into account the drinking water quality standards set out in the Drinking Water Directive.

A supply for human consumption would be compromised if, for example, an alternative source had to be used; the water blended with that from another source; additional treatment installed; or the operating demands placed on the existing water treatment system significantly increased. Deterioration of the microbiological or chemical quality of a drinking water protected area may be responsible for a supply being compromised.

The status of a body of groundwater that is also a drinking water protected area cannot be classed as good unless the body is achieving its drinking water protected area objective.

For the first river basin management plan, the data available to SEPA for the purpose of undertaking the assessments described principally related to large public water supplies. As the available data increases, particularly that for private water supplies, we expect SEPA to incorporate this into its assessment of drinking water protected areas.

These matters are set out in the 2014 Status Directions.

SECTION 5 LEVELS OF CONFIDENCE

In any system for classifying the state of the environment there will inevitably be uncertainty. This may lead to some water bodies being misclassified. Some of the uncertainty will result from the limited amount of monitoring data that SEPA has been able to obtain using the new monitoring and assessment methods before the first classification results had to be produced. Over time more data will be gathered, and this will help reduce uncertainties.

Before action to improve water bodies is taken, we need to be confident that there really are adverse impacts to be addressed: where water bodies have been classified as worse than good, we need to be confident in that classification. Accordingly we expect SEPA to provide information on the confidence of its classification for each water body. This information will be important in identifying any appropriate follow-up action.

To do this, SEPA should, in accordance with the 2014 Status Directions, identify the confidence of class in respect of the results for each quality element (or test in respect of groundwater classification) that was assessed in order to make the classification decision. It should define the confidence as either “high”, “medium”, or “low”.

In making an assessment of confidence, SEPA may take into account a range of sources of evidence about the impacts on a water body. Such evidence may include suitable data provided by other organisations. The process developed by SEPA must be transparent in order to demonstrate what evidence has been considered and the results of those considerations.

This assessment of confidence informs SEPA and other regulators' decisions about where to prioritise action, in line with the principles set out in section 2 above.

SECTION 6 PRESENTATION AND REPORTING

Classification information is an important component of the river basin management planning process. We need to ensure that those who wish information about the state of the water environment can access it readily, and consequently SEPA should make available a range of information about classification results, through a series of interactive maps using its GIS system. This information should include information about:

- the overall status of bodies of surface water and groundwater;
- the chemical status and, as relevant, the ecological status or ecological potential of bodies of surface water;
- the chemical status and the quantitative status of bodies of groundwater;
- the classification results for the individual quality elements for bodies of surface water or 'tests' for bodies of groundwater that were assessed in order to determine the classification of the water body;
- information on the confidence of class in relation to the quality elements or tests that were assessed in order to determine the classification of the water body; and
- information on whether or not protected areas are achieving their protected area objectives.

We expect SEPA to review and update the classification of water bodies on a rolling programme as new data is collected through its monitoring programmes and from other sources, as applicable. This will normally mean the results are updated once a year.

SECTION 7 CONCLUSIONS

Scotland's water environment is in a relatively good condition compared with that in many other parts of Europe. We need to ensure we maintain this position in the face of increasing pressures and the uncertainty of climate change. The introduction of the River Basin Management Planning process underpinned by the WEWS Act and CAR allows us to develop an integrated approach to managing activities that can adversely affect our water environment, so that current and future generations can enjoy and use it in a sustainable and responsible way.

Through the 2014 Standards Directions and Status Directions, we now have many of the tools we need to assess and protect the structure and functioning of our river, loch, estuary and coastal water ecosystems. We expect SEPA to use these tools to protect the ecological quality of the water environment and in turn assess how successful we have been in achieving the objectives established through the river basin management planning process.

Further tools and standards will be developed as our knowledge continues to increase.

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