UK Technical Advisory Group

on the Water Framework Directive

Response to stakeholders' submissions

UKTAG Stakeholder Review on PROPOSALS FOR A GROUNDWATER CLASSIFICATION SYSTEM AND ITS APPLICATION IN REGULATION

(PHASE 2)

Final Draft

December 2007

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WFD UK TAG
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SECTION 1 - INTRODUCTION

The UK Technical Advisory Group (UKTAG) sought comments on the scientific principles underpinning the second set of proposals for environmental standards to underpin the implementation of the Water Framework Directive. The report *Proposals for a Groundwater Classification System and it's Application in Regulation* was one of three reports released for stakeholder review and made available on the UKTAG website.

This document is intended to represent the main points of responses received. It summarises the key issues along with the response of the UKTAG. It should be read in conjunction with the revised and final *UKTAG report (October 2007) Proposals For A Groundwater Classification System and its Application in Regulation.*

This document and revised report will be available on the UKTAG web-site and will be made available on request.

Questions posed by the UKTAG for the stakeholder review

The UKTAG asked stakeholders to provide comments on the following questions:

1. Is the report clear in explaining how we have developed the proposed UK and Ireland groundwater classification system?

2. The report explains how the basic principles for groundwater classification are set in legislation (the Water Framework Directive and Groundwater Daughter Directive). The purpose of the stakeholder review is to seek views on how the classification requirements have been interpreted by the UK and Ireland. With this in mind, do you think that the approach we have taken as identified in the report and supporting technical documents:

a) Meets the classification requirements for good chemical and quantitative status as defined in both the WFD and the Groundwater Daughter Directive?

b) Uses the best information currently available? If not, please tell us about any information or scientific methods that could improve the approach.

3. Are there any other issues in relation to UKTAG's approach to developing UK groundwater classification that you wish to comment on?

Responses submitted

In total, 17 responses were received by the UKTAG and the respondents are listed in Annex 1.

The submissions provided views from non-government environment and fishing organisations, the water industry, whisky distillers and farming sectors, conservation agencies, as well as government organisations. The submissions are available from the UKTAG web-site (www.wfduk.org).

UKTAG review of submissions

The UKTAG reviewed the stakeholder responses, identifying:

- Possible amendments to the UKTAG report. This included amendments to procedures where there is new scientific evidence and/or improving explanations of methods.

- Issues to be addressed in the UKTAG response document, but that did not change the UKTAG Groundwater report. Here we provided more information on for example, on wider regulation issues within groundwater bodies and explanation on the specific tests within the groundwater classification framework or where issues cannot be dealt with at this time.

- Suggestions for future work by the UKTAG either in enhancing our understanding of the science, or in developing new tests required to support implementation of the Directive. References provided are included in Annex 2.

- Issues that are considered to be outside the scope of the Stakeholder Review and the UKTAG. These issues were provided to UK administrations and agencies.

The UKTAG then collated this report with technical authors and discussed potential changes with the environment and conservation agencies and UK administrations. This report:

- provides an overview of responses to questions;
- addresses comments on each section of the draft UKTAG groundwater classification report;
- discusses proposals for future work.

We then amended the draft Groundwater Classification Report.

There was a minor amendment to the *UKTAG report (June 2007) Proposals for a Groundwater Classification System and its Application in Regulation*.

- inclusion of ‘good monitoring requirements are’ in place of ‘key considerations are’ (p.17)

SECTION 2 - OVERVIEW OF RESPONSE TO QUESTIONS

Of the 17 submissions, 8 provided a response directly on the questionnaire provided by the UKTAG. Others provided their comments in separate submissions and these have also been included below.

Summarised below are the general comments from respondents. Specific technical issues and the UKTAG response are addressed in Section 3.

1. Is the report clear in explaining how we have developed the proposed UK and Ireland groundwater classification system?

General feedback here was that the report was clear and well-structured and explained how the UKTAG has developed the proposed classification system for groundwater bodies in the UK and Ireland.

Feedback recognised that the one-out all-out system required by the Water Framework Directive (WFD) has been well integrated into the classification process (five chemical & four quantitative tests) as part of the determination of the overall status of a groundwater body and that this, in general, was sensible and appropriate.

Some respondents suggested that the report could go further in terms of defining requirements for individual groundwater bodies.

Some elaboration of the baseline status of groundwater quality was requested by some respondents, and some linkage to the Environment Agency's Baseline Water Quality Studies was suggested.

It was felt that due to the uncertainties surrounding the understanding of groundwater movement and quality, this gave inherent uncertainties in the classification process itself.

One stakeholder asked to see the results of the peer review.

2. The report explains how the basic principles for groundwater classification are set in legislation (the Water Framework Directive and Groundwater Daughter Directive). The purpose of the stakeholder review is to seek views on how the classification requirements have been interpreted by the UK and Ireland. With this in mind, do you think that the approach we have taken as identified in the report and supporting technical documents:

a) Meets the classification requirements for good chemical and quantitative status as defined in both the WFD and the Groundwater Daughter Directive?

Many respondents agreed that the report did meet classification requirements, and there was generally praise for the use of the pragmatic “indirect model” approach and the proposal that the environmental standards are used as triggers for further investigation, deciding whether the conditions for good status have been met.

There were suggestions from some respondents on improvements that could be made, clarifying terms such as ‘unacceptable impacts’ and ‘threshold values’ and an elaboration on the understanding of the baseline setting so that there can be an adequate background level to measure against.

Some respondents raised concerns that certain of the proposals were too general, and required development and site-specific implementation to determine whether the UK implementation effectively meets the requirements of the WFD.

It was noted that this report does not cover the third requirement within WFD to take measures to reverse any significant upward trend in pollution.

b) Uses the best information currently available? If not, please tell us about any information or scientific methods that could improve the approach.

The respondents raised a few questions in this area, and made some useful suggestions on how the information used could be improved by linkage and reference to other methods.

There were concerns raised over the data that will be used for model calibration and trend analysis, suggesting that the data used for Article 7 of the WFD could be utilised here.

Again, there were some respondents who requested elaboration on some of the definitions used, such as ‘good’ versus ‘bad’ data, and again requested definition of background groundwater quality.

Some respondents raised questions over the application and implementation of the classification system in Scotland, and felt that UKTAG places more emphasis on England and Wales due to the dependence on groundwater in these areas. Concerns were raised that SEPA should not base implementation in Scotland on the principles used elsewhere.

There were suggestions that a holistic approach be used to develop measures based on risk assessment and management in addition to monitoring against the standards set by the WFD. This would tie together guidelines and standards set by other organisations such as the Drinking Water Inspectorate (DWI) and World Health Organisation (WHO).

3. Are there any other issues in relation to UKTAG's approach to developing UK groundwater classification that you wish to comment on?

In general, the methods used were praised as being inclusive and pragmatic, and the emphasis on use of a weight of evidence approach supported by good monitoring data and risk assessment was welcomed. There were a couple of concerns over the implementation of the proposals as discussed previously and below.

A few respondents raised queries about who will be responsible for the future activities planned, such as monitoring of various kinds, collection of risk assessment data, and development of conceptual models. It was highlighted that there needs to be improved liaison between the various responsible agencies to have clarity over issues such as this. Also, it was suggested that some commentary is needed on who would make the final decision on whether there are impacts associated with water quality changes.

In certain parts, the use of threshold values and trending were questioned in relation to the fact that drinking water quality standards are based on peaks not averages. It was felt that this could lead to difficulties when dealing with breaches of the standards.

It was felt that ecological importance of groundwater as a whole, and test elements more specifically, could be elaborated upon in the report, with some discussion of the potential implications for aquatic biota.

In particular, suggestions for further work included:

- Groundwater quality could be assessed using a biological tool e.g. hyporheic meiofauna.

SECTION 3- DETAILED COMMENTS ON THE UKTAG REPORT

For each section of the draft *UKTAG report (June 2007) UK Proposals for a Groundwater Classification System and its application in Regulation,* the following is provided:

- general overview of comments;
- advice on amendments to the UKTAG report, if any;
- Detailed comments and the response of the UKTAG.

UKTAG Report – Section 1 Introduction

<u>Overview</u>

In addition to the issues raised in Section 2, comments included requests for:

- Clarification of how environmental good status versus potable good status would be addressed.

- Concern about the approaches throughout the UK in implementing the groundwater classification system into regulation.

- Concern about the consistency of the WFD with other directives namely the Groundwater Daughter Directive and the Nitrates Directive.

- More information needed on the importance of groundwater.

Amendments to the UKTAG report

The introduction of the report was not amended.

Comments	Response
The introduction of the report explains how the groundwater classification system would help determine good status. The question arose as to how will Environmental Good Status versus "potable" good status be addressed?	To meet good groundwater status a number of tests must be passed. Some of these relate to environmental receptors such as surface waters and groundwater dependant terrestrial ecosystems and others to the use of groundwater such as the drinking water protected area and the general groundwater quality test. UKTAG must set criteria based on how the groundwater is used. This is further explained in the footnote on p.25 of paper 11bUKTAG Paper 11 b (i) - Guidance on Groundwater Chemical Classification and in sections 7.1 and 7.4 of this paper.
There was concern regarding the approach that SEPA will take in implementing the classification system in regulation, with regard to both old and new builds. It was felt that the UKTAG's emphasis is strongly on issues pertaining to England & Wales and because of this Scotland should not base their principles on the current practices in England & Wales as there is a danger that this would lead to overregulation	This report represents a UK view. The implementation in terms of regulation is dealt with by the individual agency.
The ecological importance of groundwater is needed in the introduction of the report.	The ecological importance of groundwater is recognised through the 2 separate tests one for Groundwater dependant ecosystems (GWDTE) and one for Surface water ecology.
Consistency with other directives; There was concern that the requirements of the new Groundwater Directive could create conflicts with the operation of previous legislation. Although Defra have reassured us that such conflicts will not arise, and that nitrates, for example, will be addressed through the Nitrates Directive. There is little reassurance in this consultation, and confirmation from the regulators is needed that they will respect the view taken by the Department.	There will be no conflict with the Nitrates Directive arising from the classification system itself. The Nitrates Directive is a basic measure under the WFD but it has always been the case that if further action over and above basic measures are needed to meet WFD objectives these must be considered. The Nitrates Directive does not address non-agricultural sources of nitrate. The approach to regulation will be set out in regulations brought in to implement these directives.
Environmental good status does not mean that the water will be able to be used for drinking water production.	Agreed

UKTAG Report – Section 2 The need for a Groundwater Classification System

Overview

Taken as a whole, the respondents gave a thorough examination of the chapter and identified a range of key issues:

- Clarification was needed on the environmental standards for pesticides, nitrates and Annex VIII pollutants and how they apply to groundwater and surface water bodies.

- A number of respondents supported the indirect model approach although there was concern with possible conflicts between Article 7 and with the safeguard zones (SGZ), protecting water quality.

- Several water companies wanted more monitoring in 'at risk' water bodies.

- The water industry were concerned about the minimal time period used to classify groundwater, they offered data from their own records which will provide more information over a greater time period.

- It was pointed out that the effect of host geology can have an influence on groundwater quality.

- More information was asked for in terms of time lags in groundwater systems and the reversal of trends.

Amendments to the UKTAG report

This chapter has not been amended.

Comments	Response
The groundwater environmental standards explicitly apply to nitrates and pesticides, whereas the Annex VIII specific pollutants apply to all water bodies, surface and groundwater. Is this correct?	Nitrates and pesticides "standards" set out in the Groundwater Daughter Directive apply to groundwater but are used as action values. For Groundwater UKTAG will set threshold values which are local environmental standards for any pollutant where a risk is identified. Specific pollutants apply to surface waters under Annex V (1) of the WFD.
There was general support for the indirect model approach where standards will be used as triggers for further investigation to determine whether the groundwater body achieves good chemical status or not. • Need to ensure that the indirect model will not conflict with Article 7 of the WFD and the aim to reduce (where possible) the level of water treatment.	• The indirect model will meet Article 7 for chemical status for groundwater. The environmental agencies will have to ensure that the best available information is used and integrated to all aspects so that one model doesn't conflict with another. Refer to memorandum of understanding that the environment agencies have with the water authorities.
• The use of Safeguard Zones (SGZ) (to protect drinking water quality) should not be delayed in deference to the indirect model (further investigation to prove the existence of a problem); but rather SGZ	• The protection of drinking water protected areas is build into the chemical status test. A groundwater body would be at poor status where a threshold value is exceeded and there is an increasing trend

Comments	Response
should be applied until human health can be assured without further treatment being undertaken.	in contaminant concentrations. The environment agencies will use their regulatory powers to protect abstractions in order to meet the WFD objectives. Safeguard zones will be used as an additional tool to aid regulation and planning in order to protect groundwater.
• Using the standards as triggers for further investigation was not the emphasis in the first stage of environmental standards report (Aug 06) when a look up table was proposed for determining good ecological status with respect to river flow and abstraction pressures.	• The Phase 1 Environmental Standards Report did not include groundwater quality. See link for Phase 1 report http://www.wfduk.org./stakeholder_reviews/Standards_Jan_2006/LibraryPublicDocs/UKTAG%20ReportAug%202006UKEnvironmentalStandardsandConditionsFinalReport
It was suggested that further monitoring will be targeted at the 'at risk' water bodies. Since the water bodies 'at risk' are those identified during River Basin Characterisation 1; • Can we therefore expect increased monitoring within these areas to identify the causes of pollution? • Will this monitoring also consider the pathways that link the source and receptor?	• There will be more monitoring for water bodies 'at risk' in accordance with WFD operational monitoring guidance. http://www.wfduk.org./tag_guidance/Article_08/monitiring_gw. Results are publicly available in the UK. • Yes
• There are concerns that the RBC1 methodology was different to that proposed in this paper and that some sites failed to be identified. UKTAG are asked to use the sites and data provided by the water industry through the collaborative Article 7 identification work.	• As required by the WFD, RBC1 focused on pressures and risk assessment data, whereas classification relates to the condition of the groundwater body based mainly on monitoring data. Subject to availability, timeliness and review of data quality, UK agencies fully intend to make use of relevant data.
UKTAG state that the status of groundwater bodies is influenced by six elements which are quantitative and/or chemical. • Geology should be mentioned as one of the influencing elements. The effect of the host geology is reflected in the chemistry but the actual influence is geological. For instance water in the Kellaways Beds beneath Bedfordshire which is little influenced by man and it is not classed as 'good'.	• The Water Framework Directive does not explicitly allow for this. Groundwater can be poor quality naturally. Geology is taken into account as the natural background quality is considered when establishing threshold values.
Conceptual monitoring is proposed as the basis on which standards and thresholds are set, and from which Programme of Measures (POMs) may follow. The testing of conceptual models is built into the proposed process. It should be recognised that validation, as opposed to testing, will be required to justify any proposed costly	The conceptual modelling will be validated by the monitoring results which will then be used to inform the classification.

Comments	Response
measures. In the absence of robust validation, it is likely that affected businesses will reject measures as incorporating unacceptable levels of uncertainty.	
This issue of time lags in groundwater systems is alluded to in the overview, but is not developed in the remainder of the document. • The agricultural perspective is that there is a historical legacy already well embedded in the unsaturated zone, but that recent recharge is believed to be of improving quality. This is the case for nitrate, for example, where Defra states that 75% of surface water monitoring sites exhibited a declining trend in the past 5 years, and EA monitoring data indicates that a number of major rivers such as the Trent and Thames, which drain extensive areas of NVZs, have been declining for at least 15 years. • Monitoring at the point of abstraction will clearly fail to detect quality improvements and reliance on such monitoring may result in the trends in groundwater bodies being wrongly assessed and reported. The limitations and weaknesses of monitoring at the point of abstraction should be recognised and acknowledged so that businesses are reassured that they are not at risk of being penalised inappropriately.	Trends are considered in a separate paper which will be completed in early 2008. • Such issues cannot be taken into consideration during the classification process. Classification status is a snapshot of the existing condition of water bodies, irrespective of the source of the anthropogenic impact. • Improvements in quality which may not yet be showing up will be taken into account when considering which measures need to be put in place. To fail this test there need to be an exceedance of a threshold and a trend in concentration. When considering what measures need to be put in place account will be taken of the effectiveness of existing measures.
In some cases it would be very difficult to completely reverse downward trends, for example in Runcorn / Widnes a ground water body has been used for industrial abstraction for a number of decades, if there are no perceived impacts why can this not continue?	Under the WFD UKTAG are obliged to prevent further deterioration in quality. If the groundwater body is still fit for purpose then this is accepted. Classification as poor status does not automatically mean that all abstraction should cease.
Would be interested to see more information on the reversal of trends.	The reversal of trends is a separate objective under WFD and is the subject of another paper which is currently being drafted by UKTAG.

UKTAG Report – Section 3 Overview of Groundwater Classification

Summary

Taken as a whole, the respondents gave a thorough examination of the process of groundwater classification and identified a range of key issues:

- Clarification was needed on the overall process regarding the development and monitoring of conceptual models.

- There were differing views on how to report classification with high confidence.

- Specific question as to when the conceptual models will be developed and refined.

- There was general concern that data needs to be utilised from longer time periods for trend analysis and conceptual model development.

- Climate change should be incorporated into the groundwater classification scheme especially relating to changing reference conditions.

- Specific question asked, which data is used to determine background levels?

Amendments to the UKTAG report

This chapter has not been amended.

Comments	Response
The approach envisaged will involve significant effort in terms of the development of conceptual models, monitoring and the collection of improved risk assessment data. • Who will be responsible for these various activities and whose field data will be used? • Will these models be seen? • If water companies have developed their own conceptual models (sometimes in conjunction with environmental regulators) can these be used for the characterisation and determination of status?	• The environment agencies will be responsible for development of conceptual models, monitoring and collection of risk assessment data and will base these on any relevant information available. • Though the final format of River Basin Plans has not yet been decided, consideration will be given as to whether to include conceptual models, where relevant. • Conceptual models are a relatively simple means of driving targeted monitoring. Conceptual Models will not necessarily be numerical models. Conceptual models draw upon the information available. The environment agencies welcome getting further information to help refine our conceptual models. Water Authority models could be taken account of where appropriate. Shared models in England and Wales are already being used. The GWDD suggests we use conceptual models for all our Groundwater bodies and we will be focusing on areas at risk. Conceptual models will be used where appropriate and numerical models will be developed in areas of high risk, where appropriate.
What frequency will the models be reassessed	It is not clear from the response whether the

Comments	Response
and refined? Page 12 (stage 3: determine status) states that ideally six years of data should be used. Is this really enough to show deterioration? Weather patterns may have huge influence on this relatively short timescale. Longer datasets should be used where possible to get the best available trend data.	discussion is about trends or drinking water protective areas. On trends UKTAG is restricted to what is in the directive. The classification process is formally on a 6 year cycle. As better data become available then classification is refined. UKTAG will use whatever appropriate data are available to assess trends.
If there are insufficient data to classify, the UKTAG proposes that the environment agencies report that the groundwater body is good status, but with low confidence. • This is supported. However, given the longer timescales required for groundwaters to recover from pollution, consideration must be given to safeguarding the quality of drinking water sources; particularly when permitting activities associated with groundwater bodies that have been reported in this way. • There is concern over this as the consequences of classifying a water body as good status and then having to down grade it in future years will be significant for all stakeholders. It was suggested that the body be classified as poor status but with low confidence to reflect a precautionary approach. • Where there is insufficient data to classify for the first reporting cycle of RBMP it is contradicting other approaches where data may be lacking for TRACs/Coastal. • The UK TAG proposes that conceptual modeling of the individual groundwater bodies be used by the environment agencies as a precursor to determining status." How long would such an exercise take and who will be paying for the work and how will it be carried out? Will the work of CAMS feed in to this?	Agreed. • Prevent and limit provides protection and will be the main driver in the regulation of new activities. Please refer to Paper 11 b (iii) - Use of standards in regulation paper, as the link between status and regulation is described in this paper. This concern is recognised and has been subject to much debate. UKTAG has agreed that in the absence of sufficient data groundwater bodies will be classified as good but with low confidence. On balance we consider this the best approach to focus resources. It does not mean that there will be no protection to groundwater as the non-status objectives (principally prevent or limit inputs) will still have to be followed. • For TRAC waters UKTAG are proposing not to classify if there is no information. If UKTAG are worried about situation then there will be monitoring data available in order to classify. • The first classification has to be done by March 08 and reviewed through the cycles set in the directive. Catchment Abstraction Management Strategies (CAMS) identify groundwater under pressure and this information will be bought into the conceptual model. The conceptual model drives the monitoring and further investigation. The environment agencies have funds to carry out classification.
There are concerns about the data available for the model calibration and trend analysis. This document suggests that only the WFD monitoring data which started in December 2006 will be used. This is insufficient for trend analysis and seems to be a major flaw in the methodology. • Water companies encouraged the use of water company data to assist in the model calibration.	There in no intention to restrict to 2 years data, p.11 of the report refers to the time period over which the agencies will carry out classification rather than the length of period of monitoring data used. Providing data are made available and are quality assured they will be used. • UKTAG agreed that they will use data where available and as appropriate.

Comments	Response
Where groundwater bodies cut across River Basin Districts (RBD), how will this influence the specific requirements of individual rivers or wetlands?	The specific requirements of individual rivers or wetlands will be dictated by the need to protect the rivers and wetlands regardless of where the Groundwater body is.
One of the impacts of climate change is likely to be impacts on the reference condition of waterbodies, directly on quantitative status, and indirectly on water quality. Measures identified as relevant and appropriate to deliver good status under current reference conditions may cease to be appropriate as reference conditions change. Processes are required for forecasting changes in reference condition, and hence good status, over the timescales within which groundwater bodies respond to, which may be very considerable.	Such changes can be accounted for via the reviews undertaken as part of the six year River Basin planning cycle. Characterisation, monitoring and the classification process should identify long term changes in background conditions.
Section 3 on page 12 proposes that groundwater should be reported as having good status where there is insufficient monitoring evidence to make an assessment. However Article 4(1b) of the WFD requires Member States to both control the input of pollutants to groundwater, and prevent deterioration in status, subject to some considerations. Would classifying water bodies above the level justified by monitoring evidence create additional pressures for the UK when monitoring evidence does become available?	Classification must be based on evidence. The alternative, to classify bodies at poor status where there is a lack of data could potentially result in measures being put forward where no environmental problems exist.
To enable future standards to be set, a clear understanding of the baseline setting needs to be understood. There has been no mention of the definition of baseline status of groundwater quality. It is not clear how this assessment will occur or even if it has been linked to the EA's Baseline Water Quality Studies. Which data will be used to determine background levels?	The baseline and background are both defined in the GWDD. UKTAG presume the query is about background levels. The 2 concepts are used differently. The EA does have natural background studies. See link below to for the link of the overview document of the Environmental Agency/British Geological Survey baseline reports (on groundwater quality). www.publications.environment-agency.gov.uk/pdf/SCHO0207BLXY-e-e.pdf

UKTAG Report – Section 4 Groundwater Classification – Key Principles

Overview

- Respondents asked for flexibility for abstraction licenses within water bodies.
- In general the emphasis on the use of the weight of evidence approach is supported.
- A definition of ‘good data’ was asked for.
- Specific question as to how Catchment Abstraction Management Strategies (CAMs) would link to the WFD standards for surface water.

Amendments to the UKTAG report

- This chapter has been amended with the inclusion of 'good monitoring requirements are' in place of 'key considerations are' (p.17)

Comments	Response
If no standards have been developed for the quantitative aspects of groundwater status, how are these to be measured and what evidence is required? • Will this be using the CAMS methodology and how will that be linked to the WFD standards for surface waters?	UKTAG have developed the framework and more details will be published as the river basin plan is published. • In England and Wales CAMS is being reviewed and will incorporate WFD requirements. The quantitative status test (see quantitative paper) clearly sets out the criteria for assessing status.
If different environmental standards may apply within a single groundwater body, does this mean that there will be some zoning which will enable flexibility with regard to abstractions rather than blanket licenses within waterbodies?	There will be some flexibility regarding abstractions as standards will be set to protect both the overall resource within the groundwater body and individual receptors such as wetlands.
Within the report, UKTAG writes about 'good data from monitoring' [e.g. page 17 (bullet point 7)]. While this is agreed in principle it would be useful for more detail or a definition as to what data they should consider 'good' or 'bad'.	**Report slightly amended** Definition: Good data is reliable and fit for purpose. See also UKTAG guidance on monitoring http://www.wfduk.org./tag_guidance/Article_08/view and EU guidance that deals with precision. CIS guidance on Groundwater monitoring 2000/60/EC.

UKTAG Report – Section 4 Proposals for Chemical Status

General comments:

- A number of respondents had reservations regarding the technical application of the chemical status tests with regard to nutrients.
- Definition of 'sufficient extent' was asked for.
- It was felt for Chemical tests 1, 3 and 4 all needed good monitoring data to ensure the results are meaningful.
- The water companies accept that the use of threshold values and trending can indicate change or deterioration. However this does not resolve that water company investment will be based on breaches of the DWI standards rather than average trends.

Amendments to the UKTAG Report

This chapter has not been amended.

Comments	Response
There were reservations about the technical approach to classifying the chemical status of groundwaters in respect of nutrients, particularly phosphorus. It is not clear that the classification rules proposed will adequately protect groundwaters as a critical water source of low phosphorus content for surface water habitats.	In principle our Surface water test does protect the surface water from nutrients arising from groundwater bodies. However, there must be a standard set for the nutrient in surface water for that nutrient to be considered. Phosphorus will be considered but as there is no nitrate standard for rivers in the first RBP cycle the impact of nitrate derived from groundwater on rivers cannot be assessed. See Paper 11 b (i) – Guidance on Groundwater Chemical Classification for more details. ,
How will 'sufficient extent' be defined when talking about area and will it be a percentage of the groundwater body? One water supply borehole should have a greater weighting since it draws water from a wider area than many private boreholes.	Sufficient extent is defined by assessing the average or the weighted average based on representative areas or zones of contribution of the monitoring points. This is expanded on in Paper 11 b (i) – Guidance on Groundwater Chemical Classification.
Chemical Test 4 for Drinking Water Protected areas states: 'we need to identify trends that might lead to additional treatment'. The last 6 years data will show a different trend to the whole data set of 30 years, and would be more reflective of recent weather patterns giving a different view on where investment might be required. • There were concerns that this test is looking at the mean of 6 years data but from a public health requirement it is the peak concentration that is the trigger for investment not the overlying trend. • The test fails entirely to provide any provision for the historic legacy or time lags. Inputs to the unsaturated zone may be improving markedly, but the test may well record that the water body is of poor and deteriorating status, leading to pressure for measures which may be inappropriate. It is fundamentally flawed as a result. The outcome of any such test would be unlikely to be accepted as any kind of justification for measures by farmers due to these fundamental flaws. More relevant information on the quality of current recharge to the unsaturated zone will be needed to provide information that is relevant to modern circumstances, as set out above.	There in no intention to restrict to a minimum time frame of data in order to determine trends, UKTAG will use data where available and as appropriate. The length of the dataset will be different for different objectives. More data is needed for trends than looking at status • There is a procedure in Annex 2 to Paper 11 b (i) – Guidance on Groundwater Chemical Classification that explains how we propose to protect against peak concentrations • The test fairly reflects the wording of the Directive. To fail this test there needs to be an exceedance of a threshold and a trend in concentration. Time lags cannot be taken into account but are properly considered when assessing what measures need to be put in place to reverse any adverse trend.
Chemical Test 1 and 3 implies extremely good knowledge of both surface water and groundwater inputs as well as the fate of pollutants across the groundwater body in order to assess relative contribution from groundwater at >50% level.	We must use the data we have available. It is recognised that, particularly in the first RBP cycle, the data may be quite limited, leading to low confidence in the classification results. See UKTAG Paper 11 b (i) - Guidance on Groundwater Chemical Classification for further information on these tests.
Some parameters may not cause any long-term water quality problems even though they are	Even if an abstractor is the only one impacted then the competent authorities are obliged to treat

Comments	Response
changing in concentration. To clarify, localised saline intrusion in some cases are only an issue for the abstractor, if there are no impacts to other sensitive receptors, is there a problem?	the abstraction as a receptor for classification. If there are localised impacts i.e. saline intrusion and the abstraction is rendered unsuitable for use without additional treatment the body should be classified as being at poor status. See section 4.9 in 11bUKTAG Paper 11 b (i) - Guidance on Groundwater Chemical Classification and in sections
There has been an avoidance of the fact that the water quality standards are based on peaks and not averages. The use of threshold values and trending can indicate change or deterioration but it does not resolve the fact that water company investment will be based on breaches of the DWI standards rather than average trends.	The uses of threshold values in relation to groundwater used for drinking water are explained in more detail in Annex 2 of the technical paper. This explains how peak concentrations are taken into consideration.

UKTAG Report – Section 6 Proposals for Quantitative Status

Overview

- Clarification was needed on the surface water test and if it considers all surface water and abstractions and if it uses the conceptual model as the main tool.
- The percentage values for allowable abstractions should indicate that further monitoring is required.
- There was concern over the lack of good monitoring data which would feed into the Water balance test.
- A definition of 'unacceptable impacts' was asked for.
- There was concern that if long-term abstraction ceased then the ecology could be affected.
- The quantity test should be adapted to incorporate provision for climatic change which would include reference condition changes.
- Natural England were concerned that groundwater intercepted from feeding a wetland through groundwater or drainage would be called 'drainage' and will therefore not feature as a pressure under WFD and will leave wetlands vulnerable.
- Natural England also noted that wetland systems that are dependant on groundwater e.g. wet dune slacks were not included in the classification scheme.

Amendments to the UKTAG report

- The Chapter has not been amended.

Comments	Response

Comments	Response
The surface water test indicates that a 50% allowable abstraction is the driver for failing to achieve good status. • It was felt that all percentage values must be indirect indications for further investigation, not absolutes requiring action. Ecological harm linked to abstraction needs to be demonstrated before significant changes to abstraction licenses/conditions are required. This is the approach recommended on P27 when assessing groundwater dependent ecosystems.	Agreed, a surface water body must already be at less than good before UKTAG proceed with this test. • Further investigation in next river basin plan is needed to address ecological harm linked to abstraction. This would not classify but would highlight the risk. There is evidence that ecological harm is attributable to over-abstraction. This could be classified as failing the groundwater tests but ecological evidence is needed for surface water. UKTAG supports what is said and there needs to be evidence of harm or likely harm before licenses are amended.
• Where is the water balance test conducted? • Does this consider all surface waters and also all abstractions? • Does this test use the conceptual model as the main tool?	• The test is carried out across a whole groundwater body. • It considers all the surface water bodies that cross it. The test considers all abstractions from the groundwater body and uses the conceptual model. Other tests deal with more local scale issues. This test does not consider surface water abstractions. • Evidence of sustained trends in groundwater levels over at least one river basin planning cycle will inform our confidence in the status assessment for this test. This is detailed in paper 11 b (ii) - Guidance on Groundwater Quantitative Classification.
The UKTAG have suggested the following water balance test: "If the total abstraction is less than the recharge less the ecological needs of river bodies then this element of the groundwater body will be good status." It was suggested that there is a significant problem with this equation which is the lack of good data on the ecological needs of river bodies. The balance should not attempt to achieve a numerical precision that cannot be supported by the quality of the data. "For the quantitative element of status UKTAG have not set standards. The approach is to determine whether abstractions cause measurable and unacceptable impacts on the groundwater body or an associated surface water body." There is concern that there is no accompanying guidance on the meaning of 'unacceptable impacts'. What is acceptable to one stakeholder	The test proposes to use best available information and is part of a hierarchy of abstraction tests. This impact on the ecological status of the surface water body is subject to a separate classification process. Details of the assessment of 'unacceptable impacts' are detailed in the technical reports.

Comments	Response
group may not be acceptable to another. This will need to be tested against the wider sustainability objective.	
The potential impacts of ceasing to abstract should also be taken in to account. Continuous activity over a number of years establishes a baseline that may be affected if the activity ceases. Ecological habitats that have been created by the human effect on the water environment should be seen in the wider context. The transient nature of activities and the short term impacts will have to be taken in to account with respect to ecology.	Noted. If pumping is stopped then could end up with groundwater flooding. This comes under the objective setting process under the WFD
The Quantity Test should be adapted to incorporate provision for climate change, according recognition to changes in reference condition and hence good status, and continuing to share the available resource in similar proportions between the need to support river ecosystems and human needs. This will impact on step 1, the long term average recharge, and step 3, the contribution needed to support river ecosystems.	Climate change can be accounted for via the reviews undertaken as part of the six year River Basin planning cycle. Characterisation, monitoring and the classification process should identify long term changes in background conditions.
The Environment Agency (in England) has currently identified groundwater bodies largely on basis of 'productive strata'. However there are a number of wetland ecosystems dependent on groundwater that is not flowing from the recognised (WFD) groundwater bodies (for example: wet dune-slacks). The directive clearly indicates that bodies of water in the ground should be identified as groundwater bodies if a terrestrial ecosystem is dependent upon these. We advise the Environment Agency to include such bodies as groundwater bodies.	This topic is subject to ongoing discussion. It is not the only objective protecting wetlands.
The Environment Agency (in England) has indicated that it will treat groundwater being intercepted from feeding a wetland through groundwater or 'deep' drainage as 'drainage'. We are concerned that this form of groundwater abstraction will not feature as a “pressure” and will therefore not be addressed under the WFD, leaving wetlands vulnerable. We advise the Environment Agency to rectify this situation.	Groundwater intercepted from feeding a wetland via drainage ditches is not considered to be an abstraction. It may be more appropriate to address this type of issue under site management of Habitats Directive sites. It is not appropriate to be dealt here.
Further, within the report UKTAG addresses each of the test elements (i.e. salinity) separately but fails to address the importance of these elements and their potential ecological implications for aquatic biota. For example, there is a growing body of evidence that the entry of salmonids into freshwater is linked to temperature, and that river temperature is influenced by the quantity of groundwater arising.	Ecological classification considers temperature. If there is an issue then ecological status would go to less than good. The groundwater quantitative surface water test could then indirectly establish whether the quantity of groundwater rising is having an affect on temperature.

UKTAG Report – Section 7 Implications

Overview

- A specific question was asked regarding the number of groundwater bodies that were at risk but with low confidence.

- It was proposed that a stakeholder workshop should be held to take forward issues and implications for the groundwater classification framework.

- It was noted that more work needs to be done for implementation and this needs to be cost effective and meet the needs of the WFD.

Amendments to the UKTAG report

- The UKTAG report has not been amended.

Comments	Response
A question was asked with regard to Table 2 how many of those groundwater bodies are at risk but good, with low level of confidence?	UKTAG are still undergoing classification and the results of this will be published in the Draft River Basin Management Plans (RBMP) in 2008. Page 29 of report sets this out in more detail.
This part of the consultation is much higher level and less specific than the proposal for standards. It is correspondingly more difficult to perceive the implications as so much less is said about them. It is not unusual for unforeseen implications to arise when implementation starts. It would be valuable for the issues to be drawn out and discussed in a stakeholder workshop	Individual environment agencies will be involved in stakeholder engagement arrangements over the coming months. Classification results will be shared with River Basin Liaison panels as they become available.
However, the proposed methodologies are very general and in some respects go little further than re-stating the requirements of the Directive itself. There appears to be a lot more work to be done in terms of defining requirements for individual groundwater bodies. However, many areas of the proposals are general and will require significant development and site-specific implementation. Such implementation details will be critical in determining whether the UK implementation meets the requirements of the Directive and does so in a cost-effective manner	The over arching document is general. However the 3 background documents interpret the detail and the environmental agencies will apply this detail according to local circumstances, establishing a framework and measures. Work is ongoing and is being shared with River Basin liaison panels throughout the UK. UKTAG agree that implementation details will be critical and cost effectiveness will be dealt with under the programme of measures for the river basin plan and will be subject to future consultation.

UKTAG Report – Section 8 Classification and Regulation

Overview

- There was concern that some discharges to groundwater would have to cease.

- More information was requested on prevent and limit downward trends.

- Support for the adoption of de minimis/exemption provision.

- The question was posed, if rules could be adopted to address diffuse pollution issues on a sectoral basis?

Amendments to the UKTAG report

- The UKTAG report has not been amended.

Comments	Response
It was thought that p31 implies that many discharges to groundwater will need to cease in order to 'prevent or limit' the discharge of certain substances to groundwaters; this could have implications for many small STWs or soakaways which discharge to groundwater.	This interpretation is not correct. Refer to Paper 11 b (iii) - Use of standards in regulation.
The approach has only focused on achieving 'Good Status' as referred to in the report on page 5 and therefore not provided clarity on the other objectives, in particular to Prevent and Limit downward trends. Article 6 under WFD is one of the most important to the water industry in particular with regard to wastewater discharges. WFD includes a specific prohibition relevant to all direct discharges of pollutants into groundwater.	Article 6 under the Groundwater Daughter Directive will be the most important driver in protecting groundwater quality in the UK and the ROI. Refer to Paper 11 b (iii) - Use of standards in regulation. Direct discharges are outside the scope of this report.
Consents for wastewater discharges to groundwater are being drafted in line with the current regulations, introducing in effect a "zero" standard for each List 1 substance. Under the Common Implementation Strategy guidance document on the application of the term 'direct and indirect inputs' in relation to the Groundwater Directive 2006 acknowledges that "it is not technically feasible to stop all inputs of hazardous substances and some small inputs are environmentally insignificant and therefore do not present deteriorating risks for groundwater. An approach is therefore required to allow revised consents to be issued under the current regulations but including the adoption of the de minimis / exemption provision.	The existing Groundwater Directive is limited in approach for de minimus. Refer to Paper 11 b (iii) - Use of standards in regulation. We do not have the new regulations which implement the new Directive yet.
The prevent and limit regime as expressed in the Directive includes reference to diffuse pollution. Will binding rules be set for certain sectors as it might not be possible to control diffuse pollution only through permits and authorisations? Nitrate applications to land have occurred over decades, there seems to be a lack of enforcement of the current Groundwater Regulations, mainly due to the lack of diffuse pollution control. Consequently some water companies have been forced to adopt a nitrate treatment solution at high cost. Could rules be adopted to address diffuse pollution on a sectoral basis?	Nitrate is not within the scope of the existing Groundwater Directive (80/68/EEC) and Groundwater Regulations, but is within the scope of the Water Framework Directive and new Groundwater Daughter Directive. These Directives are yet to be fully implemented and powers to control diffuse pollution are currently being considered by the Administrations. This is beyond the scope of the consultation.

SECTION 4 - REQUEST FOR ADDITIONAL WORK

Respondents requested additional work on:

- Biological methods to test groundwater quality.

This section clarifies the UKTAG response on this issue.

Future Work

Comments	Response
Similar biological methods to those already used to assess surface water quality, namely those involving the quantitative and qualitative assessment of macro invertebrate populations, should be extended for use as a test parameter for groundwater quality. Due to the strong physicochemical relationship between ground and surface waters, hyporheic meiofauna present in groundwater could be utilised as bio-indicators for assessing both ground and surface water quality.	This has been excluded from the Groundwater Daughter Directive as there are no data and sampling methods that can be routinely used for groundwater ecology. There is a clause which allows you to bring in biological methods. However this is not feasible to use at present as you cannot find the hyporheic meiofauna everywhere. The EA and Scottish Natural Heritage (SNH) are researching the possibility of developing a useable system; however this is a long way off.

ANNEX 1 - LIST OF RESPONDENTS

Submission	Organisation
5	Wessex Water
6	South West Rivers Association
7	APEM Ltd
8	Quarry Products Association
13	United Utilities
14	Severn Trent Water Ltd
15	Water UK
17	Scottish Water
18	Mecoprop-P Task Force
20	Natural England
21	Scottish Whisky Association
22	Scottish Salmon Producers
25	Gospall Fishing Club
27	Consumer Council for Water
29	Joint Environmental Programme
34	National Farmers Union
35	Department of Business Enterprise and Regulatory Reform

ANNEX 2 - REFERENCES PROVIDED BY RESPONDENTS

Topic	References	ID
Monitoring data	Sites and data provided by the water industry through the collaborative Article 7 identification work/ Article 7 protected areas work	5
Conceptual models for Groundwater	Scottish Water's groundwater models for aquifers – used for public water supplies	17
Phosphorus Management	NERC LOCAR (Lowland Catchment Research Programme)	20
Monitoring	World Health Organisation's Water Safety Plans	27