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Title: Concept paper on streamlining of monitoring and reporting of monitoring results under the NiD, WFD and SoE.

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This version was discussed in the SCG meeting. Please note that the current document does not include the comments received from WG D Reporting and from the Nitrates Committee, they are presented in a separate table that was circulated to the SCG.

The SCG meeting concluded that the paper is not yet mature enough for endorsement. It was agreed that further discussions and perhaps an ad-hoc workshop were needed where current initiatives in Member States can be shared.

COM does not have the resources to continue the work on this issue this year. The activity could rely on volunteer Member States to take it forward e.g. with a workshop or the topic could be included into the next CIS work programme.

The Water Directors are invited to:

take note of the progress so far and agree to discuss the possible continuation of such activity in the context of the discussion on the next CIS work programme.



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1 Introduction

Although the Nitrates Directive, the Water Framework Directive (WFD) and the WISE¹ State of Environment (SoE) monitoring and reporting all deal with surface water and ground water quality, monitoring programmes and reporting cycles differ between the three streams. Therefore there seems to be a need to explore the possibilities of streamlining the monitoring and reporting obligations under the WFD, NiD and WISE- SoE and assess the need for the development of integrated guidelines on monitoring and reporting.

Monitoring under the Nitrates Directive is predominantly focused on nitrates concentrations in all water body types and on parameters used for assessing the trophic status of water bodies. Reporting under the NiD covers information gathered through monitoring of surface waters and groundwater.

Under the WFD, monitoring covers biological, physico-chemical (including nutrients) and hydromorphological quality elements and reporting covers i.e. i) the characteristics of the river basin district, including the identification of the significant pressures and impacts, ii) the design of the monitoring programmes (e.g. location of monitoring stations, range and frequency of monitored parameters) iii) ecological and chemical status of surface water bodies and quantitative and chemical status of groundwater (for both surface water and groundwater nutrient concentrations are not reported).

There is no specific monitoring associated to SoE, however all 32 EEA member countries report under SoE nitrates concentrations and data on eutrophication in all water body types.

Different starting date of the three reporting streams and different ways how the policies developed make it difficult to compare reported data.

Activities on streamlining of monitoring and reporting

In April 2010 a questionnaire on the streamlining of monitoring and reporting under the Water Framework Directive (WFD), the Nitrates Directive (NiD) and the EEA's State of the Environment (WISE SoE) was launched. The replies were analysed by the Commission and the EEA. The results of the questionnaire were presented and discussed in the Nitrates Committee, the WFD Strategic Coordination Group and the appropriate EEA National Reference Centres (NRCs), which are entrusted with reporting under each of the streams.

Establishment of an ad-hoc Group on Streamlining

The results of the analysis were also presented to the Water Directors at their meeting in Spa in December 2010. During the meeting, Water Directors endorsed the establishment of an ad-hoc expert group. The objective of the ad-hoc expert group is to draft a concept paper presenting the possible integrated guidelines on streamlining in a first phase and possibly develop integrated guidelines in a second phase.

In the first phase, a small core group of experts appointed by the Water Directors is taking care of drafting a concept paper outlining possibilities for streamlining regarding monitoring and reporting of data. This document will be discussed in the Nitrates Committee, the WFD Strategic Coordination Group and the appropriate NRCs.

Based on the discussion in the first phase and subject to the positive feedback from the Nitrates Committee, the WFD Strategic Coordination Group and the appropriate NRCs, support will be requested from the Water Directors for a second phase that will lead to the development of the final integrated guidelines. These will be developed by the ad-hoc expert group and will be presented to the three Committees and to the Water Directors for final endorsement.

Aim of this paper

The aim of this paper is to identify commonalities under the Nitrates Directive, the Water Framework Directive and the WISE State of the Environment Reporting with regard to monitoring and reporting of data, as a basis to discuss options for streamlining (see Fig. 1). The paper has an exploratory character and seeks to outline a step-wise approach to streamlining, keeping in mind that streamlining should help

¹ WISE SoE, formerly called Eurowater Network or Eionet.

reduce the burden of reporting and avoid double reporting. The benefits of streamlining should outweigh the burden of change.

The concept paper addresses the technical and legal aspects of each of the streams to seek synergies between them. The design of the monitoring networks, the monitored data, the time lines and the various purposes of the monitoring and reporting processes will have to be considered. The paper takes into account the needed flexibility under each of the monitoring and reporting streams to cater for the different realities across the EU and will also look into expected consequences and impact of the integration work. The aim is to facilitate and harmonise monitoring and reporting to the degree possible and to ensure the comparability and interpretation of monitored data and reported results under different directives or reporting streams.

This document does not provide specific in depth technical analysis of how the streamlining is achieved, the question of 'how' should be covered in the second phase. This document does not deal with transitional, coastal and marine waters.

Table 1 presents challenges and opportunities of the streamlining; the ones which are part of this phase of the work on streamlining are presented in more details in the following chapters.

Table 1. Challenges and opportunities of the streamlining

Challenges of the streamlining	Opportunities of the streamlining
<ul style="list-style-type: none"> - agricultural monitoring network (NiD) vs. generic monitoring network (WFD - SoE) - linking past reported data with the new reporting in case changes in monitoring networks is substantial - differences between reported data/parameters/frequencies - Some textual information reported can/is overlapping -Reporting cycles under the NiD and WFD - Respecting aims and legal obligations 	<ul style="list-style-type: none"> - reduction of monitoring and reporting the same stations under different processes - in the long term it will be easier to assess status of waters and compare changes over a long period - for a number of MS, the streamlining would allow to report only once all data without specific additional data preparation; - cross-references between reports will reduce the volume of textual information; - possibility to align reporting cycles;

2 Objectives of monitoring and reporting and possibilities for streamlining

This chapter focuses on technical aspect of monitoring and reporting, as described in the various guidance documents adopted under the NiD, the WFD and SoE. Although guidance documents are not legally binding for the Member States, they constitute an agreement on best practice for implementation and give valuable information about some technical aspects. Each of the sub-chapters provides an overview of the current recommendations/obligations for monitoring and reporting followed by considerations on opportunities for streamlining.

	WFD	NiD	WISE SoE
Objectives	to achieve good status of surface waters and groundwater by 2015.	to prevent and reduce water pollution caused or induced by nitrates from agricultural sources.	to analyze state of European waters and support EEA analysis of state of environment

2.1 Selection of monitoring stations and dealing with spatial variability

Currently, WFD and SoE are covering all pressures to water bodies, NiD focuses only on pressures from agriculture.

Table 2: overview of the monitoring programmes and the criteria for the selection of sites under the WFD, NiD and SoE as presented in the Directives/guidelines documents.

	WFD	NiD	WISE SoE
Monitoring programs on surface water	<p><u>Surveillance monitoring</u>: an assessment of the overall surface water status within each (sub)catchment within the river basin district. Assessment of ecological status at surveillance monitoring sites might also contribute to the assessment of the extent of nutrient pollution from agricultural and other sources, e.g. for the assessment of nitrate pollution in those countries that have established and applied action programmes throughout their national territories for the NiD</p> <p><u>Operational monitoring</u>: Objectives: to assess 1. the status of the water bodies and decide whether water bodies risk to fail good status; 2. the effectiveness of measures introduced under WFD and other water-related policies and help decide what other measures might be needed;</p> <p><u>Investigative monitoring</u> : Objectives: 1) investigate the reason for exceedances, 2) ascertain the causes of a water body failing to achieve good status, 3) ascertain the magnitude and impact of accidental pollution.</p>	(art. 5 § 6 and art. 6 of the NiD) Member States shall draw up and implement suitable monitoring programmes to assess the effectiveness of action programmes and for the purpose of designating and revising the designation of vulnerable zones.	Not applicable, SoE data draw on national monitoring programs

<p>Selection of monitoring stations (surface water)</p>	<p>Sites representative of the water body or a group of water bodies</p> <p><u>Surveillance monitoring</u>: sufficient to provide an assessment of overall surface water status within each catchment and sub-catchment of the river basin district. In addition specific points are to be included on water bodies that are significant due to size or volume or are transboundary.</p> <p><u>Operational monitoring</u>: sufficient stations to assess magnitude and impact of pressures on water bodies that are at risk of failing or are failing the environmental objectives, e.g. where this risk is due to nutrient enrichment and water bodies have been assessed as eutrophic under NiD (Nitrate Vulnerable Zones)</p> <p><u>Investigative monitoring</u>: there is no requirement or suggestion on selection of monitoring stations.</p>	<p>(art. 6 of the NiD)</p> <p>Nitrate concentrations shall be monitored at surface water sampling stations, laid down in Article 5 (4) of Directive 75/440/EEC and/or at other sampling stations which are representative of surface waters of Member States. Also, the eutrophic state of fresh surface waters, estuarial and coastal waters shall be monitored</p> <p>(Guidelines on monitoring)</p> <p>One river station per 300 to 1000 km² of land area. And 1 station per 5 to 30 km² of water surface (lakes).</p> <p>Increased density² inside and at borders of designated vulnerable zones and 'at risk' zones. (Waters that are eutrophic or may become eutrophic in the near future)</p> <p>Less dense in regions with low nutrient pressures and homogeneous soils and water bodies.</p> <p>Trophic status of surface waters should be monitored and reported.</p>	<p>Representative network of subset of national monitoring stations to reflect all key pressures, not just agriculture.</p> <p>For rivers there is a guide of a minimum of 1 station per 1000 km² of land, or a statistically representative selection (nationally) representing the various pressures. For lakes the guide is for a minimum of 1 station/lake per 1750 km² of land.</p> <p>SoE includes all sources of nutrient pressure and maintains annual reporting not only for stations with high concentrations but those with low observed values too.</p>
<p>Monitoring programs on ground water</p>	<p><u>Surveillance monitoring</u> is required in water bodies or groups of water bodies at risk of failing WFD objectives based on the information from the characterization exercise and in bodies which cross MS boundary. It is also necessary to carry out surveillance monitoring in water bodies or groups of water bodies that are not at risk of failing WFD objectives.</p> <p>Objectives: i) to validate risk assessments, ii) to classify groundwater bodies, iii) to assess trends</p> <p><u>Operational monitoring of chemical status</u>: required in bodies at risk of failing to meet WFD objectives based on the information from the characterization exercise and from surveillance monitoring.</p> <p>Objectives: i) establish chemical status of groundwater bodies, ii) identify the presence of trends, iii) assess the effectiveness of the programme of measures</p> <p>Drinking Water Protected Area monitoring: to identify any</p>	<p>(art. 5 § 6 and art. 6 of NiD) Member States shall draw up and implement suitable monitoring programmes to assess the effectiveness of action programmes and for the purpose of designating and revising the designation of vulnerable zones.</p>	<p>Not applicable. SoE data draw on national monitoring programs</p>

² Increased density is not further defined in the draft guidelines for the NiD monitoring requirements.

	<p>deterioration in the quality of abstracted groundwater</p> <p>Prevent and limit monitoring: specific additional monitoring programmes aimed at point source pressures for compliance check or investigation</p> <p><u>Monitoring of quantitative status:</u> not relevant for streamlining</p>		
Selection of monitoring stations (ground water)	<p>The design of all monitoring programmes is based on the conceptual model / understanding of the groundwater system</p> <p><u>Surveillance monitoring:</u> at risk bodies – stations coinciding with operational monitoring points; not at risk bodies where confidence in the risk assessment is low – at least 3 points in the most suitable GWB per grouping; body groupings where pressures are limited (low or absent) - at least 1 point per grouping.</p> <p><u>Operational monitoring points:</u> representative in relation to key receptors (e.g. water-dependent terrestrial ecosystems and the related surface water bodies) and key pressures. Distributed across body when subject to diffuse pollution</p> <p>Specific monitoring at Drinking Water Protected Areas e.g. in safeguard zones</p> <p>Prevent and limit monitoring: at point source pressures</p>	<p>(art. 6 of NiD) Nitrate concentrations shall be monitored at sampling stations which are representative of the groundwater aquifers of Member States</p> <p>Based on conceptual hydrogeological models, taking account on the presence of agricultural N-sources (includes hydrodynamics and hydrogeochemistry)</p> <p>To obtain a representative picture of nitrate concentration in groundwater. Dependent on land use and hydrogeological conditions Sampling point should be in the upper (the first 5 m of the saturated zone) and lower parts of the aquifer that are connected to the soil.</p>	<p>Representative network of subset of national monitoring stations to reflect all key pressures, not just agriculture.</p> <p>Groundwater bodies should meet at least one of three criteria; be at least 300 km² in area; be of regional, socio-economic or environmental importance; exposed to severe or major impacts.</p> <p>SoE includes all sources of nutrient pressure and maintains annual reporting not only for stations with high concentrations but those with low observed values too.</p>

Opportunity for streamlining:

- Monitoring:
 - There is no need for streamlining for those MS having already one single monitoring network for both surface waters and groundwaters.
 - For remaining MS, it is possible to merge stations currently monitored under the NiD and those currently monitored under the WFD/WISE SoE monitoring in one single monitoring network (they are already partially overlapping, see table in annex I).
- Reporting:
 - If there is full streamlining for monitoring, there will be automatically streamlining on reporting as well (as regards selection of monitoring sites)
 - If there is no full streamlining for monitoring (networks are kept separated for NiD and WFD, with the existing partial overlapping), there is the possibility to streamline reporting for those overlapping stations.

2.2 Frequency of monitoring

The frequency of monitoring depends on legal obligation under the three streams (summarized in the table below) but also on the MS choices or needs.

Table 3: monitoring frequency requirements under the WFD, NiD, WISE SoE

	WFD	NiD	WISE SoE
Frequency	<p>Surface water monitoring: The recommended monitoring frequencies for surveillance monitoring for biological quality elements are at least once every 6 months for phytoplankton, once every 3 years for other aquatic flora, macroinvertebrates and fish. For physico-chemical quality elements they are generally at least once every 3 months, with the exception of priority substances where the monitoring frequency should not be less than once every month.</p> <p>For operational monitoring the frequency of monitoring required for any parameter shall be determined by the Member States so as to provide sufficient data for a reliable assessment of the status of the relevant quality element. As a guideline monitoring frequencies should not be lower than those mentioned above for surveillance monitoring.</p> <p>Groundwater monitoring: Surveillance monitoring: based on the aquifer types and the transmissivity it is advised to monitor in the range between quarterly and every 6 years.</p> <p>Operational monitoring: based on the aquifer types and the vulnerability of groundwater bodies it is advised to monitor in the range between quarterly and annually. Trend assessments should be carried out twice/year or annually.</p> <p>Drinking Water Protected Area monitoring: it is recommended as a minimum to carry out at least once before and once within each RBMP cycle (6 years).</p>	<p>Nitrates Directive requirements (art. 6):</p> <p>Nitrate concentration should be monitored over a period of one year at least every four years, except for those sampling stations where nitrate concentration in all previous samples has been below 25 mg/l and no new factor likely to increase the nitrate concentration has appeared. In those cases monitoring should be repeated every 8 years.</p> <p>For surface waters, the monitoring must be done at least monthly and more frequently during flood periods.</p> <p>For groundwater, monitoring must be done at regular intervals and taking into account the provisions of Directive 80/778/EEC.</p> <p>Guidelines requirements:</p> <p>Surface waters: the monitoring must be done at least monthly and more frequently during flood periods.</p> <p>Groundwater: MS should sample at the most appropriate frequency according to local hydrogeological conditions and with regard to the influence of abstraction. As a guide, at each monitoring station samples should be taken at least twice a year.</p>	<p>Monthly average values should be reported for both surface and groundwater.</p>

Opportunity for streamlining:

- Monitoring:
 - For nitrates concentrations, the highest frequency is required under the WISE SoE (monthly sampling every year). Consequently, full streamlining would require this frequency.

- Reporting:
 - Data monitored to report under WISE SoE can be used under the two other streams.

2.3 Data aggregation for reporting

Aggregation is understood as statistical recalculation of data to obtain an average value from number of records.

Currently, due to different aggregations used in each of the three streams datasets are not comparable. Aggregation is considered for vertical aggregation, spatial and temporal aggregation of monitored data.

2.3.1 Vertical aggregation of groundwater data in each of the streams

Vertical aggregation is only relevant for groundwater and, consequently, only for nitrates concentrations (monitored parameters for eutrophication are not relevant for groundwater).

The depth at which the sample is taken can strongly influence the observed nitrate concentration. Concentrations will be higher in the shallow layer than in the deeper layers, due to denitrification processes. Vertical aggregation is understood here as aggregation across all depths, however it is not understood as aggregation within a particular depth range.

	WFD	NiD	SoE
<i>Vertical aggregation (samples taken at different depths):</i>	As regards monitoring, the guidelines adopted under the WFD recommend to sample at different depths. However, nitrate concentrations are not reported as such, as only the chemical status of the GW body is reported. Real concentrations are reported only where the chemical status is poor and quality standard of 50mg NO ₃ /l is exceeded. In these situations, data are reported aggregated per RBD.	As regards reporting, there is no vertical aggregation, nitrates concentrations in each sample taken at different depths should be reported	Vertical disaggregation is requested in reporting guidelines, however some data is received in aggregated form

Opportunity for streamlining on reporting:

- Nitrates concentrations in each station should be reported disaggregated only once, so to cover ND, SoE and WFD.

2.3.2 Spatial aggregation of data in each of the streams

Spatial aggregation is understood as aggregation of a number of monitored stations towards a fictitious station in an area/catchment.

Stream	Information about data aggregation in guidance reports, data dictionaries, etc.
WFD	Results are provided as aggregated data per monitored water body (for both surface water and ground water). There is also the possibility to group water bodies. In this case monitoring is carried out only on one (or few) water bodies and the status classifications are valid for the whole group of water bodies.

	<p>It has to be noted that for both groundwater and surface waters, concentrations of nitrates and parameters relevant for eutrophication are not reported. MS only report on the status of surface waters and groundwater bodies.</p> <p>Actual concentrations are only reported in case of parameters exceeding the thresholds in poor status groundwater bodies. Information about surface water bodies is provided only in an aggregated form as 'nutrient conditions' for that water body. There is indirect information about nutrient levels in the water body, because the classification of the nutrient conditions needs to be harmonised with the class boundaries of ecological status.</p>
NiD	<p>For groundwater, according to the data dictionary (List of groundwater monitoring stations table) data should be reported for each monitoring station. No aggregation of monitoring stations to groundwater body or river basin should be done.</p> <p>For surface waters, no aggregation is required as well.</p> <p>Disaggregated data on coastal/transitional/marine waters should be provided by MS.</p>
SoE	<p>For Groundwater, disaggregated data from each sampling site is recommended for reporting. However, annually aggregated data for each groundwater body with summary statistics, including the total number of sampling sites within the aggregated data, and the number of samples per site per year is also possible.</p> <p>For surface waters, annual average concentrations at each station with summary annual statistics (mean, median, maximum and minimum) is recommended for reporting. However, seasonally aggregated data can be also reported.</p>

Opportunity for streamlining on reporting:

- Nitrates concentrations in each station should be reported disaggregated only once, so to cover ND, SoE and WFD.

2.3.3 Temporal aggregation of data in each of the streams

Temporal aggregation is understood as aggregation of measurements from a number of years to provide average of averages for e.g. reporting period.

Currently, due to different frequencies of reporting (annual vs. 4-6-8 years) datasets of the three streams are not comparable.

	<i>Information about data aggregation in guidance reports, data dictionaries, etc.</i>
WFD	The relevant quality elements are reported as aggregated for a 6 year period.
NiD	<p>Reporting is required every 4 years. Data are provided in different formats: yearly data for 1, 2, 3 or 4 years or average values from 2 to 4 years or one series of yearly data. NiD guidelines for reporting: where monitoring is carried out over more than one year or was continuous, the data over two to three years are combined to obtain more accurate average and maximum values for each parameter³.</p> <p>For surface waters, average nitrogen values for the whole 4 years period is reported. For those water bodies liable to eutrophication, also winter averages (October –April) and some indication on trophic state and eutrophication parameters is reported.</p> <p>For groundwater, annual averages and maximum values of nitrates concentrations for the period should be provided, supplemented with an indication of the measuring period and the number of measurements during that period.</p>
SoE	<p>SoE data are reported annually</p> <p>Some data are reported aggregated by season. More typically, an annual average is provided.</p>

³ The guidance for reporting (5.1 p. 8)

Opportunities for streamlining on reporting:

- Non-temporally aggregated data should be provided, so to make possible re-use of data for specific assessments. This would have the advantage that small pre-processing of data would be needed at MS level before reporting⁴
- Monthly average concentrations per year should be reported.

2.4 Selection of parameters

Currently, different parameters are monitored and reported under the three streams. However, streamlining will focus only on common parameters, such as nitrates concentrations and parameters used for defining the trophic status of waters.

Table 3. Monitored surface and ground- water parameters (WFD, NiD and WISE SoE)

	WFD	NiD	SoE
Nutrients to be monitored (surface waters)	'Nutrients conditions' as a summary parameter; usually covers N and P i.e. but not reported on individually.	The following substances have to be measured: <ul style="list-style-type: none"> • Nitrate • Trophic state: member states can chose what parameters they measure to describe the trophic status of surface waters. <p>According to the draft monitoring guide⁵, the following parameters have to be monitored:</p> <ul style="list-style-type: none"> • Rivers, lakes: <ul style="list-style-type: none"> ○ Nitrate (between October and March) ○ Orthophosphate (over the whole year). ○ Total Nitrogen and Total phosphorous (during the growing season) 	Rivers and Lakes: Nitrate, total oxidised nitrogen, total nitrogen, nitrite, total organic nitrogen, organic pollution determinants and chlorophyll a, orthophosphate (in rivers) and total phosphate in lakes.
Parameters to be monitored (ground water)	Core parameters: oxygen content, pH, conductivity, nitrate, ammonium, temperature and appropriate major and trace ions <u>Surveillance monitoring:</u> Core parameters and selected/case specific parameters indicative of pressures that are putting the GWB at risk (e.g. pesticides and other hazardous substances) <u>Operational monitoring:</u> Core parameters and Selected/case specific parameters based on conceptual models and risk assessments	Nitrate Conductivity pH Oxygen	nitrate nitrite total ammonium dissolved oxygen

⁴ Pre-processing and QA&QC by MS will still be carried out, only further processing will not be carried out

⁵ Non-statutory draft guidelines for the monitoring required under the Nitrates Directive (91/676/EEC), 2011

Opportunities for streamlining:

- Monitoring
 - All three streams have overlaps in terms of monitored parameters.
 - If monitoring networks (i.e. location of monitoring stations) stay as they currently are, the overlapping parameters (e.g. nitrate for groundwater and rivers⁶) in the overlapping stations can be monitored only once.
 - If full streamlining is achieved as regards monitoring networks (location of monitoring stations), all parameters currently requested under the three different streams will have to be monitored in all stations only once.

- Reporting:
 - All three streams have overlaps in terms of monitored parameters.
 - If monitoring networks (location of stations) stay as they currently are, the overlapping parameters (e.g. nitrate for groundwater and rivers⁷) in the overlapping stations can be reported only once.
 - If full streamlining is achieved as regards monitoring networks (location of stations), all parameters currently requested under the three different streams will have to be reported in all stations once.

2.5 Classification/interpretation of results

The assessment of the monitoring results should lead to the same conclusions in terms of water quality independently from whether the assessment is being done using the WFD, the NiD or the SoE data. However, currently, different methodologies / definitions can lead to different classifications.

As regards eutrophication, Table 5 compares the terms used in the WFD and the Nitrates Directive in relation to eutrophication.

Table 5. Comparison of key terms used in WFD and the Nitrates Directive in relation to eutrophication

	Water Framework Directive	Nitrates Directive
Assessment result (water body not fulfilling the objective and requiring measures)	Water body at less than good status based on eutrophication related biological quality elements and/or supporting elements (e.g. nutrients) or judged at risk of deterioration. Good ecological status for the algal and plant quality elements includes an absence of undesirable disturbances due to accelerated growth. Nutrient conditions must support the biology. Being worse than good ecological status for these quality elements due to nutrient enrichment implies an eutrophication issue.	"Polluted waters": Waters found to be eutrophic or in the near future may become eutrophic if action is not taken
Water categories	All freshwaters and transitional waters, and all coastal waters that are on the landward side of a line that is 1 nautical mile seaward of the baseline from which the breadth of territorial waters is measured.	Natural freshwater lakes, other freshwater bodies, estuaries, coastal waters and marine waters
Location of pressures	All pressures are addressed at water	Agricultural sources are considered at

⁶ Other overlapping parameters will be identified in the second phase of the work

⁷ See 6

	body level.	nitrate vulnerable zone level (land areas which drain into identified waters and which contribute to pollution)
Required action	Development of the Programme of measures (PoM) to achieve good status and to ensure no deterioration of the status of surface water and groundwater. This includes measures established in the action programmes under the Nitrates Directive (as foreseen in Article 11.3 and Annex VI part A of the WFD). Water bodies not in good status due to nutrient enrichment should be coherent with the designation of polluted waters under the Nitrates Directives	Nitrate vulnerable zones must be established over the catchment of "polluted waters". Action programmes must be established and implemented to prevent and reduce pollution by nitrates from agricultural sources.

Although different terms are used, the underlying concepts are similar, e.g. there is a quality problem in (part of) a particular river, lake or coastal area (called water body, or polluted water) that is caused by an activity or pressure located in the land draining into the water body having less than good status.

As regards interpretation of results, trend analysis is also required by different Directives, although in different terms:

- Under the NiD results of the most recent reporting period are compared with the previous reporting period. Monitoring points with increasing, stable and decreasing nitrates concentrations are identified.
- Under the WFD, a deterioration of status occurs when the status of a water body degrades from one status class to the next (e.g. from good ecological status to moderate). Analysis of significant and sustained upward trends in groundwaters is also required for pollutants causing risk of failing to meet WFD objectives.
- Under the WISE SoE trends are calculated by EEA on the basis of annual reported data.

Opportunities for streamlining:

- monitoring:
 - As regards eutrophication, the same methodology is to be used under the WFD, NiD and WISE SoE,. Therefore the same parameters are to be monitored.
- reporting:
 - As regards eutrophication, relevant parameters (used for assessing trophic status) are to be reported for each station. An overall assessment of the trophic status is to be reported for each water body.
 - As regards trends in water quality, it could be possible to calculate them based on the long time series under the three streams (as it is currently done under WISE SoE).

2.6 Reporting cycles under the different streams

Currently, data are submitted every year under SoE, every 4 years under the NiD and every 6 years under the WFD.

Table 6: Reporting obligations and time lines for the three streams

	WFD	NiD	SoE
Design of the monitoring programmes	Monitoring in accordance with the provisions of Art. 8 and Annex V WFD had to be operational since December 2006. Member States had to report the design of their monitoring programmes for surface waters, groundwater and protected areas in March 2007.	Monitoring in accordance with the provisions of Art. 6 had to be operational since December 1993, for the purpose of designating and revising vulnerable zones. Reporting on monitoring programmes is part of the reporting obligations according to art. 10 (see below).	
Reporting of monitoring data on nutrient concentrations	There is no obligation to report monitoring data. Monitoring data is used for the classification of ecological status/ potential and chemical status of surface water bodies, and for the assessment of quantitative status and chemical status of groundwater bodies and for protected areas. Reporting cycle: none	According to art. 10 and Annex V, Member States had to report monitoring results, since 1995, for each 4-year period.	Monitoring data are submitted every year.
Reporting spatial information on monitoring stations	Spatial information about location of water bodies and monitoring stations is reported into WISE and is an integral part of the River Basin Management Plan (RBMP). Reporting cycle: every 6 years as part of the RBMP	Spatial information on monitoring stations is presented in maps and also as geographical coordinates and should be provided every 4 years	Coordinates of monitoring stations and spatial information of water bodies are part of the information provided annually
Reporting about status of water bodies	Status of water bodies is reported in the RBMPs. MS are required to provide a map for each river basin district illustrating the classification of the ecological status/potential and chemical status for each body of surface water and a map of the status of groundwater (based on quantitative and chemical status). MS are required to report the methodology of status assessment and the results and methodology of trend assessment. In case of GWBs in poor status the reasons and the observed concentration values should be reported. Reporting cycle: every 6 years as part of the RBMP.	According to art. 10 and Annex V, Member States had to report maps with identified polluted waters and monitoring results, since 1995, for each 4-year period MS might opt to carry out trend analysis over a longer period for those common points of which earlier data are available and starting from the moment the monitoring point became operational	Trend analysis is undertaken by the EEA
Reporting spatial information about the status of water bodies	The map showing the status of each water body is reported into WISE and is an integral part of the RBMP. Reporting cycle: every 6 years as part of the RBMP	According to art. 10 and Annex V, Member States had to report maps with identified polluted waters, since 1995, for each 4-year period	Maps by River Basin District are used to portray average river nitrate concentrations. Maps are developed by the EEA.
Reporting of the plans / action programmes	River basin management plans: According to Art. 15 WFD MS must report their RBMPs and subsequent updates to the EC 3 months after publication of the plans. In addition to the RBMPs MS have agreed to report data into WISE based on the Reporting Sheets agreed with Working Group D (Reporting); this includes e.g. spatial data. Reporting of the first RBMP was due in March 2010. Next reporting of	According to art. 10 and Annex V, Member States had to report nitrates vulnerable zones and a summary of actions programme, since 1995, for each 4-year period	

	RBMPs is due in 2016 and 2022.		
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Opportunities for streamlining on reporting:

- Depending on the solutions found on streamlining of monitoring (as regards location of monitoring sites, frequency of monitoring and parameters to monitor) and on reporting (as regards aggregation), cycles could be aligned:
 - If full streamlining is achieved for monitoring and reporting in so far that aggregation is concerned, reporting could be done annually as regards monitoring data and every 4-6 years (to be discussed) as regards other information about measures put in place (Programme of Measures under WFD and Action Programme under ND)
 - If partial streamlining is achieved for monitoring, cycle of reporting will have to be aligned accordingly (to be developed in the second phase)
 - If no streamlining is achieved for monitoring, cycle of reporting could stay as it is currently or could be aligned (4-6 years - to be discussed)

3 Conclusions

As outlined in the previous section there are a number of opportunities for streamlining but further technical analysis is required to assess streamlining feasibility.

Chapter 2 presented possibilities for streamlining in connection to different issues:

- monitoring
 - spatial distribution of monitoring stations
 - frequency of sampling
 - monitored parameters
- reporting:
 - aggregation of monitored results (vertical, spatial and temporal)
 - interpretation of results (including trend analysis)
 - reporting cycles for monitored data and other relevant textual information

Each of these issues should be considered separately. As outlined in previous sections, streamlining of monitoring networks has been carried out in some Member States. Annex I presents the current situation in terms of overlapping monitoring networks for the three streams.

In particular:

- Monitoring - spatial distribution of monitoring stations
 - There is no need for streamlining for those MS having already one single monitoring network for both surface waters and groundwaters.
 - For remaining MS, it is possible to merge stations currently monitored under the NiD and those currently monitored under the WFD/WISE SoE monitoring in one single monitoring network (they are already partially overlapping, see table in annex I).
- Monitoring frequency:
 - For nitrates concentrations, the highest frequency is required under the WISE SoE (monthly sampling every year). Consequently, full streamlining would require this frequency.
- Monitoring - selection of parameters
 - All three streams have overlaps in terms of monitored parameters.
 - If monitoring networks (i.e. location of monitoring stations) stay as they currently are, the overlapping parameters (e.g. nitrate for groundwater and rivers⁸) in the overlapping stations can be monitored only once.
 - If full streamlining is achieved as regards monitoring networks (location of monitoring stations), all parameters currently requested under the three different streams will have to be monitored in all stations only once.
- Monitoring - interpretation of results
 - As regards eutrophication, the same methodology is to be used under the WFD, NiD and WISE SoE. Therefore the same parameters are to be monitored.
- Reporting – spatial distribution of monitoring stations
 - If there is full streamlining for monitoring, there will be automatically streamlining on reporting as well (as regards selection of monitoring sites)
 - If there is no full streamlining for monitoring (networks are kept separated for NiD and WFD, with the existing partial overlapping), there is the possibility to streamline reporting for those overlapping stations.
- Reporting-frequency:

⁸ Other overlapping parameters will be identified in the second phase of the work

- Data monitored to report under WISE SoE can be used under the two other streams
- Reporting - aggregation of monitored results (vertical, spatial and temporal)
 - WFD/WISE SoE Nitrates concentrations in each station should be reported disaggregated only once, so to cover ND, SoE and WFD
 - Non-temporally aggregated data should be provided, so to make possible re-use of data for specific assessments. This would have the advantage that small pre-processing of data would be needed at MS level before reporting⁹
 - Monthly average concentrations per year should be reported.
- Reporting - selection of parameters
 - All three streams have overlaps in terms of monitored parameters.
 - If monitoring networks (location of stations) stay as they currently are, the overlapping parameters (e.g. nitrate for groundwater and rivers¹⁰) in the overlapping stations can be reported only once.
 - If full streamlining is achieved as regards monitoring networks (location of stations), all parameters currently requested under the three different streams will have to be reported in all stations once.
- Reporting – interpretation of results
 - As regards eutrophication, relevant parameters (used for assessing trophic status) are to be reported for each station. An overall assessment of the trophic status is to be reported for each water body.
 - As regards trends in water quality, it could be possible to calculate them based on the long time series under the three streams (as it is currently done under WISE SoE).
- Reporting - reporting cycles for monitored data and other relevant textual information
 - Depending on the solutions found on streamlining of monitoring (as regards location of monitoring sites, frequency of monitoring and parameters to monitor) and on reporting (as regards aggregation), cycles could be aligned:
 - If full streamlining is achieved for monitoring and reporting in so far that aggregation is concerned, reporting could be done annually as regards monitoring data and every 4-6 years (to be discussed) as regards other information about measures put in place (Programme of Measures under WFD and Action Programme under ND)
 - If partial streamlining is achieved for monitoring, cycle of reporting will have to be aligned accordingly (to be developed in the second phase)
 - If no streamlining is achieved for monitoring, cycle of reporting could stay as it is currently or could be aligned (4-6 years - to be discussed)

The first phase of this work looked at the current situation and outlined possibilities for streamlining. There is a need for integrated guidelines on the subject to be developed in a second phase.

Finally, legal obligations might need to be amended, depending on the decisions taken on both monitoring and reporting.

⁹ Pre-processing and QA&QC by MS will still be carried out, only further processing will not be carried out

¹⁰ See 6

Annex I

Table 1. Percentage of surface water-rivers stations that serve for multiple reporting.

MS	Percentage of monitoring stations under NiD serving WFD and NiD**	Percentage of monitoring stations under NiD serving NiD and SOE**
AT	24	83
BE	20	0
BG	89	0
CY	20	40
CZ	24	5
DE	54	100
DK	98	21
EE	100	90
ES	67	0
FI	21	36
FR	0	34
GR	0	0
HU	0	7
IE	100	84
IT	0	0
LT	92	100
LU	75	13
LV	98	34
MT	0	0
NL	6	3
PL	0	0
PT	37	18
RO	85	6
SE	0	0
SI	100	25
SK	25	38
UK	0	2

** data based on reported stations at the time of analysis

Blank – no information

Table 2. Percentage of ground water stations that serve for multiple reporting

MS	Percentage of monitoring stations under NiD serving WFD and NiD**	Percentage of monitoring stations under NiD serving NiD and SOE**
AT	66	1
BE	9	4
BG	37	29
CY	0	0
CZ	99	100
DE	6	22
DK	0	0
EE	0	1
ES	57	4
FI	30	0
FR	10	3
GR	0	0
HU	22	0
IE	93	90
IT	0	0
LT	79	79
LU	65	0
LV	66	64
MT	0	0
NL	0	0
PL	0	0
PT	72	43
RO	38	0
SE	0	13
SI	90	24
SK	32	34
UK	67	0

** data based on reported stations at the time of analysis

Blank – no information

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