

## **POSITIONS FROM NORSK VANN\* ON THE REVISED URBAN WASTEWATER TREATMENT DIRECTIVE**

We welcome the revision of the Urban Wastewater Treatment Directive. The revision is needed to address the challenges of today and for the coming decades. We support the ambition of reducing pollution from smaller agglomerations, pollution due to rainwater, targeting micro pollutants, track non-domestic pollution at source and improving the governance of the sector. At the same time, we see the need to prioritize interventions and investments where they achieve the greatest environmental benefits, given the multiple objectives of the proposal and the potential trade-offs among some of them (e.g., between additional treatment and energy neutrality).

We would like to share our views on the following topics:

- 1. The directive must acknowledge that different climate, geographical conditions and population structure will require local adaptations to obtain the best overall and sustainable protection of climate and the environment.**
- 2. The minimum requirements for secondary or equivalent treatment must be more flexible, technology-neutral and target-based to ensure the optimal protection of all types of waterbodies.**
- 3. Requirements for tertiary treatment must have environmental benefits and acknowledge natural retention.**
- 4. Nitrogen removal requirements (85 % or 6 mg N/l) is difficult to achieve in cold climate.**
- 5. The requirement for micro pollutants must be risk-based and not only be measured in percentage reduction.**
- 6. The indicative target for storm water overflow is unrealistic.**
- 7. The requirements for monitoring needs updating.**
- 8. Cost benefit and deadlines are unrealistic.**

\*About Norsk Vann

Norsk Vann is the national voice for the Norwegian water sector. The organization will contribute to clean water and a sustainable development of the industry by ensuring good framework conditions, competence development and interaction. Norwegian Water is owned by Norwegian municipalities, municipally owned companies, the municipalities' operational assistance and some private companies cooperative water works. Norsk Vann represents 320 municipalities with approx. 96% of Norway's inhabitants. Numerous suppliers, advisers, etc. are associated members.

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1. The directive must acknowledge that different climate, natural conditions and population structure will require local adaptations to obtain the best overall and sustainable protection of climate and the environment.

**We welcome a strong framework that ensures a healthier natural environment. However, the directive must be flexible enough to allow countries with different challenges, climatic conditions and waterbodies to be able to implement the measures that best will achieve the main objective of the directive – to tackle its remaining pollution and protect the environment.**

Norway has different natural conditions than most EU countries. Norway's location in the cold north, settlement pattern, long coastline, and not least the diversity of recipients for wastewater (fresh water and coastal water of varying vulnerability), set us apart from most other European countries.

Norway has the world's second-longest coastline with a total length of about 24,000 km, or approximately half of the way around the Equator. The total amount of freshwater is abundant due to plenty of rain and a low evaporation compared to warmer countries. The ratio of treated wastewater to the recipient water is normally very low and there is normally no need to use the same waterbody as a source for drinking water.

Norway has vulnerable freshwater lakes and rivers as well as threshold fjords, which are naturally low in oxygen. These will require a high level of protection. There are also large rivers with high water flows, low water temperatures and naturally high oxygen content, deep fjords with good water exchange and open sea. Different natural conditions require adapted requirements for the treatment to achieve the best environmental protection and the most sustainable wastewater treatment.

As Norway is not a member of the EU, we cannot expect the directive to be revised with Norway's specific challenges in mind. But as the current directive is implemented in Norway, it is important that the revised directive will enable Norway to implement the solutions that will resolve our remaining challenges, and not only cater to the need in other European countries.

The Norwegian wastewater treatment policy has been tailored to meet national environmental quality objectives and meet and safeguard good status in the waterbodies, as set out in the Water Framework Directive. In addition, the competent authority granting wastewater discharge permits set stricter requirements, whenever this is needed to achieve good status.

The proposed minimum requirements for treatment are not adapted to the needs of the Norwegian water bodies. It could lead to a large environmental footprint, without the corresponding increase in the protection of the water environment, and at excessive costs. The minimum requirements must therefore be more flexible, without compromising the environmental goal for the waterbody.

A main principle should be that treatment requirements is based on the target of achieving or maintaining good condition in the water body as required by the WFD, protecting public health and safeguarding the interests of other users. An advanced level of treatment solely because it is technologically possible is not sustainable. Stricter treatment requires large investments to build new treatment plants with associated climate footprints. Operation of more advanced treatment plants also requires an increased use of input factors, such as energy and chemicals, in addition to the need for qualified operators. We fear that strict treatment requirements with little or even negative environmental benefits in some areas will decrease people's support of environmental protection and increases the risk of reduced trust in environmental policies.

## 2. The minimum requirements for secondary or equivalent treatment must be more flexible

**The requirements set out in Annex 1, Table 1, must not be the fixed minimum standard for all wastewater treatment in agglomerations > 1000 pe.**

The requirement for wastewater treatment (Article 6) is only addressing the reduction of organic matter (Table 1), it is not risk based and does not assess the actual need of the receiving waterbody.

The 1991 UWWTD opens for applying less stringent treatment, primary treatment, for agglomerations from 10 000 pe when discharging to coastal areas providing that comprehensive studies indicate that such discharges will not adversely affect the environment. Treatments plants in agglomerations below 10 000 pe in such areas require appropriate treatment. The current directive also acknowledges that biological treatment is more difficult at low temperatures and exempts the biological treatment requirement for high altitude areas (over 1,500 meters above sea level), characterized by cold climate. The new proposal lacks these exceptions and demands that all treatments plant in all agglomerations from 1 000 pe must obtain the requirements in Table 1. These requirements are not risk based nor targeted to the specific needs of the receiving water body. We ask that equivalent treatment in Article 6 should be a treatment that achieve the same level of environmental protection in the waterbody as secondary treatment and include the use of nature-based solutions.

A large number of treatment plants in Norway discharge wastewater to waterbodies and coastal waters that are nutrient-poor and exhibit high water flow, low water temperatures and a naturally high oxygen content. The proportion of discharged effluent to the waterbody is also often very small. Water quality in these areas is not affected by small discharges of biodegradable substances and upgrading to the type of water treatment required by the proposal would not entail any measurable changes to the aquatic environment.

The reduction of phosphorus can give better environmental protection than the removal of organic matter. For many oxygen-rich water bodies, which are not sensitive to biological matter nor nitrogen, the best protection of the water body is achieved by reducing phosphorus. The reduction of 90 % phosphorus is already the standard requirement in the Norwegian legislation for wastewater treatment plants in normal and sensitive areas. We ask that obtaining the requirements for phosphorus removal in Table 2 should qualify as equivalent treatment to secondary treatment in Table 1, as it will give equal (or better) protection of the aquatic environment.

The proposed treatment requirements in Table 1 will for many less sensitive coastal areas entail negative environmental impact without the corresponding environmental benefits in the waterbody. Today most of the coastline from Lindesnes to Grense Jakobselv (the Russian border in the north) is classified as less sensitive according to the requirement in the current directive. Under current regulations, many of these coastal waters are already in good condition, meaning that there are in principle no remaining challenge regarding discharge of organic matter from treated wastewater. Appropriate or primary treatment should still be sufficient in these areas where studies show that small discharges of biodegradable substances will not affect the environment and the type of water treatment required by the proposal would not entail any measurable changes to the aquatic environment. In these areas it will be more sustainable to let the biological degradation occur naturally in the waterbody than to move this part of the treatment process into a wastewater treatment plant where it is necessary to supply a large amount of energy to achieve the same result.

The environmental impact of building and operating more advanced treatment plants in these areas, will be much higher than the benefits of more advanced treatment. It is unreasonable and not sustainable for treatment plants in such coastal parts of Norway to be subjected to an equally strict regulatory framework as would stand in other parts of Europe, where discharges of organic matter from wastewater carry a large environmental impact.

### 3. Requirements for tertiary treatment must have environmental benefits and acknowledge natural retention.

**All requirements for tertiary treatment should be based on the aim to protect the environment and ensure sustainable, efficient and environmentally sound investments.**

The requirement for nitrogen removal for plants with a load of more than 10 000 pe in the catchment area of sensitive areas must include an assessment of the contribution of the pollution load and natural retention.

Discharge requirements should be based on an assessment of how much of the nitrogen in the effluent that reaches and affects the area sensitive to eutrophication. The amount of nitrogen that is retained or degraded along the way, must be included as part of the decision-making. This is especially important in countries where the discharged wastewater flows through long rapid flowing rivers and passes through large lakes before reaching the sensitive area. There are today good models that can be used to assess the natural retention for the discharge from treatment plants in the catchment area.

Building and operating treatment plants with nitrogen removal has a relatively large climate footprint, especially under cold climate conditions with a low inlet temperature of the water. Nitrogen removal under cold climate conditions requires more energy but also more volume of treatment capacity at the UWWTP. The risk of increased losses of nitrous oxide will also be higher when nitrogen removal takes place outside of its process optimum. Nitrogen removal should therefore be applied where it will have a positive environmental effect on the sensitive area that are to be protected.

### 4. The requirement for nitrogen removal is too high in cold climate

**The removal of nitrogen is important to protect sensitive waters, but the proposed minimum requirements for nitrogen removal in Annex 1 Table 2 must be less strict when the incoming water is cold.**

Nitrogen removal requires a biological process, which takes place at a slower rate in cold water. The temperature of the incoming water can many places in Norway be as low as 5-6 degrees Celsius. Nitrogen removal in such conditions require a higher hydraulic retention time, higher energy demand and the addition of an external carbon source, to achieve the same results as in warmer European countries. The proposed requirements will be extremely demanding and costly to achieve and must be weighed against the added environmental benefits to the receiving water. The environmental goals can often be achieved without the very high requirements proposed.

The minimum requirements for nitrogen must be at a lower level and it should be differentiated based on the size of the treatment plant and inlet water temperature.

## 5. The requirement for micro pollutants must be risk-based and not only be measured in percentage reduction.

**We welcome the reinforcement of control at source as the most effective way to tackle micro-pollutants and the Extended Producer Responsibility (EPR).**

The requirement for quaternary treatment is reasonable where the wastewater is discharged to an area where the concentration or the accumulation of micro-pollutants represent a risk for human health or the environment. However, an absolute requirement for all plants treating a load of 100 000 pe or above is not well justified. Quaternary treatment will require significant investments, are energy demanding and increase the climate footprint of the plant. The requirement for quaternary treatment should also for plants of 100 000 pe and above be based on a risk assessment to map the environmental need and ensure that it is implemented where it will give the greatest benefits to the environment.

Furthermore, the requirement is set as 80% removal of a mix of organic substances set out in table 3 in Annex 1. This does not take into account that, for some plants, the inlet concentrations of the indicator substances listed in the Table 3 of Annex 1 can be extremely low, making the reduction of 80% difficult and resource-intensive to achieve. According to a footnote to table 3, if less than six substances can be measured in sufficient concentrations, the competent authority shall designate other substances to calculate the minimum percentage of removal when it is necessary. However, what a sufficient concentration is and which substances that can be chosen instead, is not clear. We ask that the requirement in table 3 for quaternary treatment is adjusted so that plants with a low inlet concentration of micro pollutants must not achieve the same percentage of reduction as plants with a high concentration, as it is the concentration in the effluent that is of concern for the environment. The requirement should therefore include concentration as an alternative parameter.

## 6. The indicative target for storm water overflow is unrealistic

**We welcome the requirements for integrated urban wastewater management plans, with the aim of reduced pollution from storm water overflows and urban runoff. However, determination of targets and deadlines should be left to the countries, based on the needs of the water body.**

The suggested content of an integrated urban wastewater management plan in Annex 5, states that a maximum discharge of 1 % storm water overflow shall be an indicative target. When a deadline is set for achieving the target, it appears no longer as indicative, but as a requirement. Reducing storm water overflows to below 1 % based on dry weather conditions (Annex 5, point 2) is unrealistic.

A requirement of a maximum of 1 % overflow based on dry weather conditions would require huge investments in existing infrastructure of collecting systems. In addition, large buffer volumes must be built to be able to cope with extreme rain and water from snow melting. Most cities and towns are already built, without any available area to establish a sufficient buffer volume. It is not desirable to dig up all the infrastructure that will be required to reach a target of 1 %.

Discharges of polluted water via runoff and storm water overflows are undesirable and it is important that good and targeted work is done to reduce these discharges which in many places also go to vulnerable recipients. Determination of specific targets and deadlines to reduce the amount of storm water overflows and discharges, should nevertheless be left to the countries, based on the needs of the water body. It should be integrated with methodology established in accordance with the water framework directive.

It is unclear who will prepare these integrated plans since the boundaries are determined from the term agglomeration. The requirement neither follows municipal boundaries nor treatment plants.

## 7. The requirements for monitoring should be updated and modernized

### **The requirements for monitoring and verification of compliance needs updating to not hamper good solutions.**

Monitoring and verification of compliance is very important, but several of the requirements in part B and D of Annex 1 should have been updated in the revised proposal. The requirements are adapted for traditional sampling at conventional sewage treatment plants and can act as a hindrance to new technology and new solutions. That is unfortunate.

The directive must acknowledge the use of alternative methods for monitoring, so that requirements for sampling of the treated effluent do not hinder nature-based solutions, such as infiltration. Annex 1 Part B require that all wastewater treatment plants must be designed or modified so that representative samples of the incoming wastewater and of treated effluent can be obtained before discharge to the receiving waters. Fixed sampling requirements must not prevent the use of good nature-based solutions if these can verify and document their treatment and discharge in a satisfactory but alternative way.

The directive should also open for alternative methods for wastewater treatment plants to verify the results and compliance with the directive, such as on-line meters or the use of other operating parameters. We must expect a future development in on-line measurement and analyzers for several parameters that can be a good alternative for documenting operation of the plants and outlet concentrations. It is unfortunate if old formulations and methods in a directive will render such solutions unusable.

The proposed number of traditional samples in the proposal is very high and online instruments can be a good supplement or substitute for traditional sampling. Traditional sampling requires personnel to do the sampling and the samples must be transported to and analyzed at a laboratory. The proposed sampling regime will lead to a significant increase in costs for the larger plants that will get a requirement for daily sampling and for all plants over 50 000 pe that will have to take two samples per week for micropollutants. Larger treatment plants have advanced operational control systems that helps to capture incidents/abnormal operation that can be followed up with internal analyses. The number of traditional control samples should therefore be able to be reduced.

Requirements for both secondary and quaternary treatment are set so that one single failed sample alone can result in the treatment plant not being compliant that year. For secondary treatment none of the failing samples taken under normal operating conditions can deviate from the parametric value by more than 100 %. For quaternary treatment each sample taken shall conform to the parametric values set in Table 3. Plant from 50 000 pe are required to take 104 samples each year for micropollutants and if 1 of 104 fail the quaternary treatment is not compliant. One such sample will not reflect the operation of the plant for the year and such requirements should therefore be avoided.

## 8. Cost benefit and deadlines

### **The proposed cost is too low and the deadlines unrealistic.**

The implementation of the requirements established in the proposal will lead to a significant increase in costs. The total costs (CAPEX+OPEX) in the Impact Assessment seems underestimated. In a report from 2021, Norwegian Water (Norsk Vann) calculated the necessary investment needs for the wastewater sector in Norway to 17 billion € for the period 2021 – 2040. This was based on the current state of the sector, and regulations in the current WWTP and Norwegian regulations. The main proportion of the costs are connected to upgrading the collecting and conducting system. Already when the report was released, in January 2021, concerns were raised from the water industry about the capacity to be able to achieve all the necessary investments and improvements. The proposed revision of the directive has increased these concerns.

It will not be possible to achieve many of the deadlines in the proposed directive. It is not enough time or necessary resources available to be able to plan and build all the required wastewater treatment plants in such short time. We are also concerned that strict deadlines will result in an allocation of all resources towards meeting these deadlines and that more urgent measures must be de-prioritized. Short planning time will also lead to solutions that are rushed and not optimal nor most sustainable. The deadlines in the proposal must be adjusted so that they are realistic compared to the work that are required.

## 9. Example of the consequence of proposed directive in Norway

Karmøy municipality is located in Rogaland south-west in Norway. The total population is 42 541.



Karmøy applied for a discharge permit for a new wastewater treatment plant primary treatment in 2019. Before applying for the permit, comprehensive studies of the recipient were carried out to investigate the current quality of the recipient and assess if the discharge from the new plant would adversely affect the environment.

A recipient survey by Rådgivende Biologer concluded that “Discharges to the water bodies Sirafjorden and Åkrehamn currently have primary treatment. Earlier surveys and this recipient survey refer to a sea area that is approximated in state of nature and shows little influence from existing inputs to the Sirafjord.”

The competent authority (Statsforvalteren) concluded in their assessment of discharge permit for the new treatment plant: “Investigations of the areas where the discharge is planned show a recipient in an open sea area which has good water exchange, which does not show particular signs of eutrophication or oxygen loss. It is also not expected that the area will be particularly negatively affected as a result the discharge of wastewater.”

The new treatment plant will treat wastewater from several smaller communities with a capacity of 15 000 pe with an estimated cost is 11 million Euro. The construction of the plant has started.



*A new primary treatment plant under construction (Photo: NRK).*

The treated water from the plant will be discharged to the sea west of the island approximately 1 km from shore at 25 meters depth. The area faces the North Sea and is exposed to wind and weather. There are strong currents and good water exchange in this sea area.



*The treated wastewater is discharged in the fjord 1 km from shore at a depth of 25 meter (Photo: NRK)*



With the proposed directive this treatment plant will have to be rebuilt to comply with secondary treatment requirements, even though there is no negative effect from the discharges in the recipient. In addition, Karmøy municipality will have to build five new wastewater treatment plants with secondary treatment. The estimated total cost for the six secondary treatment plants is 50-80 million euros. Due to the geographical conditions and population structure, it is not feasible to collect and conduct the wastewater from several agglomerations to one large plant.

For Karmøy and many similar municipalities, with a robust coastal recipient for the treated wastewater, the cost of the requirements for secondary treatment is not disproportionate to the environmental gains achieved. This is not only due to high financial costs, but also the environmental burdens that construction and operation of all the new treatment plants will entail in order to meet the requirements of the revised directive.