

SUMMARY OF THE STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE NATIONAL WATER PROGRAMME 2022-2027

Ministry of Infrastructure and Water Management (I&W)

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1 STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE NATIONAL WATER PROGRAMME 2022-2027

1.1 The first National Water Programme

Every six years, the Dutch national water policy is revised and adopted in the National Water Plan and in the Management and Development Plan for the national waters. Under the Environment and Planning Act (*Omgevingswet*), these plans are incorporated in the National Water Programme. Anticipating this new legislation, the National Water Programme 2022-2027 (hereafter NWP) was drafted. The NWP describes the general national water policy and water management in the period 2022-2027, looking ahead to 2050. It also includes the international obligations of the NWP relating to the EU Water Framework Directive (WFD), the Floods Directive (FD) and the Marine Strategy Framework Directive (MSFD).

1.2 Environmental Assessment

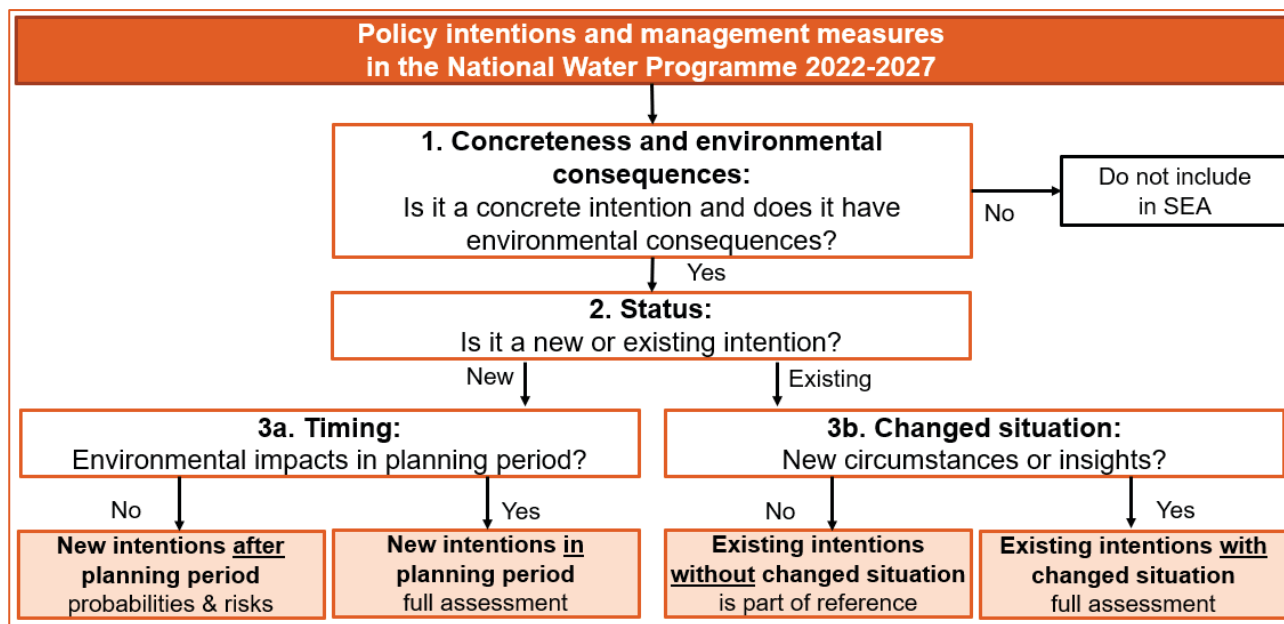
For the NWP, the procedure for the Strategic Environmental Assessment for plans and programmes applies. The aim of the strategic environmental assessment is to ensure that the environment has a prominent place in government decision making regarding the NWP. The Strategic Environmental Assessment, or SEA, presents the consequences of the policy in the NWP. The proposed policy and the activities in the NWP could have significant negative consequences on Natura 2000 areas. For that reason, an Appropriate assessment based on the Nature Conservation Act has been drawn up.

As a start for the SEA procedure, a detailed Scoping Document was published. Perspectives were provided and the Netherlands Commission for Environmental Assessment gave recommendations. In addition, discussions were conducted with interested parties in themed sessions and area sessions. The information obtained in the perspectives and in the sessions was included in the SEA. Together with the draft NWP, the SEA will be available for viewing for six months. The Minister for I&W, the Minister for Agriculture, Nature and Food quality and the Minister for the Interior will adopt the definitive NWP. The results of this SEA provide a basis for the definitive NWP.

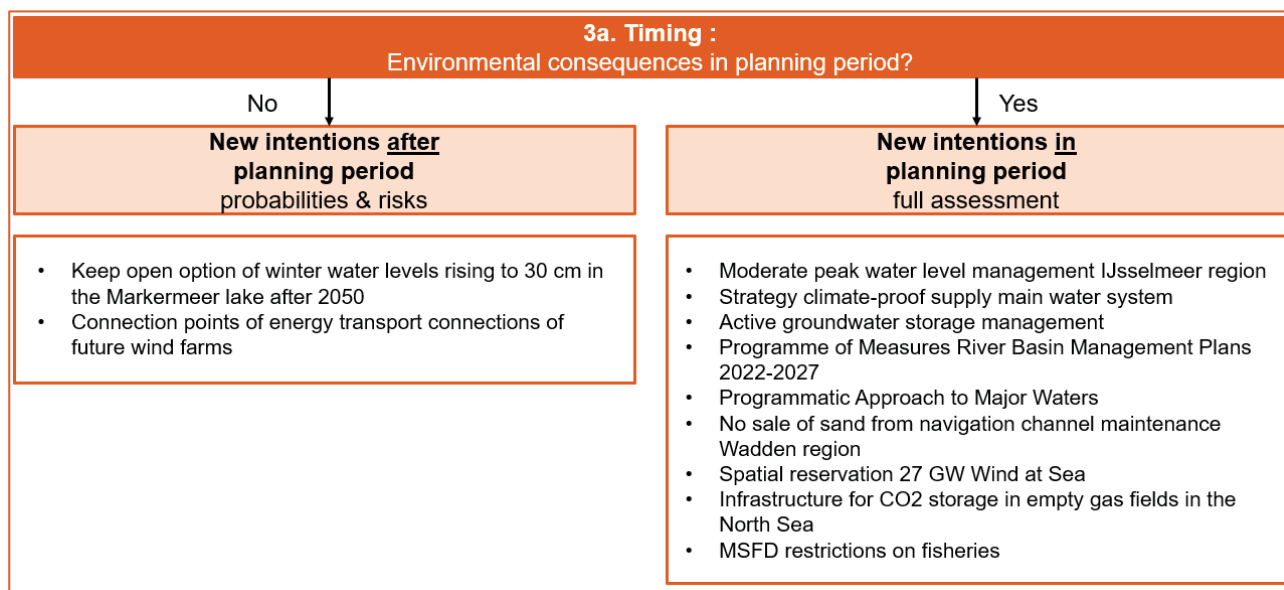
2 THE INTENTIONS OF THE NWP THAT WERE ASSESSED IN THE SEA

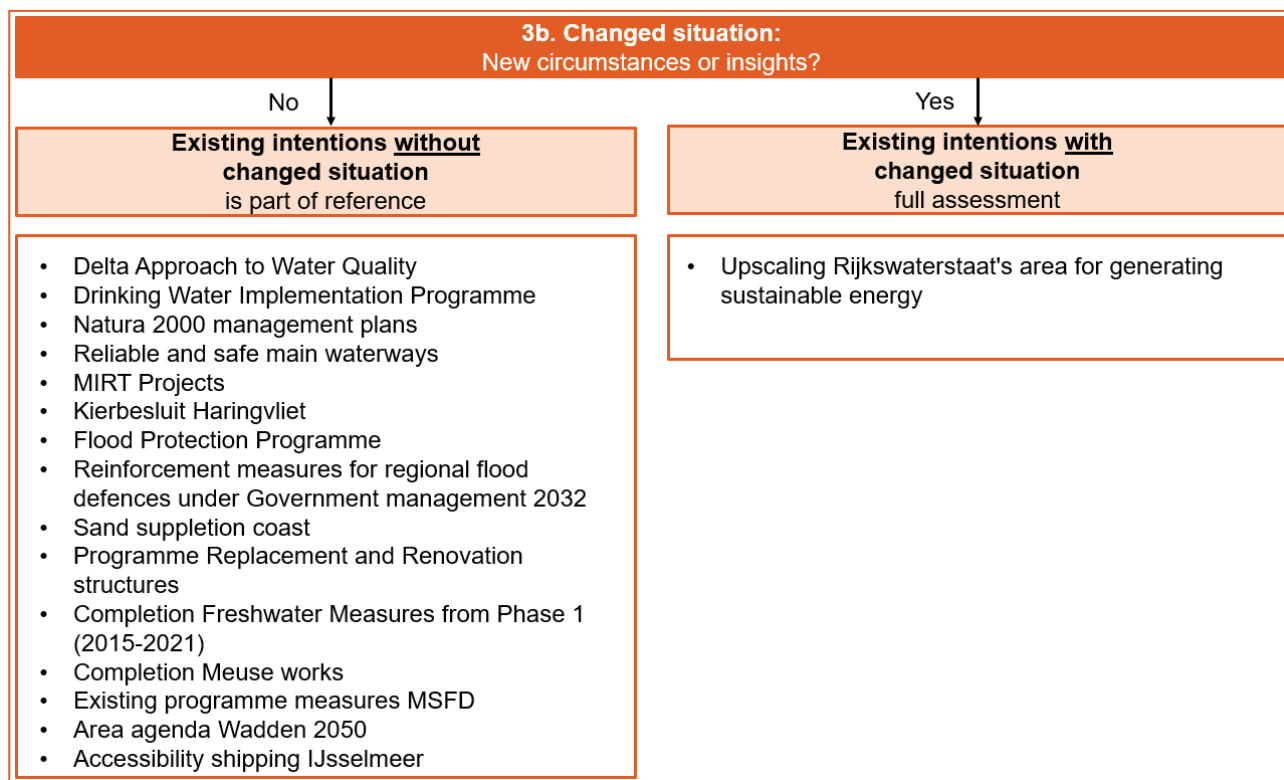
2.1 Screening of intentions

The NWP consists of several policy intentions and control measures, such as policy choices, standards, objectives, management strategies and principles. To determine whether and how an intention should be assessed in the SEA, a funnel process was used. The text of the NWP was divided into intentions. These were screened for concreteness/environmental impact, new or existing consequences and - if existing - whether these should be addressed.



From the NWP text, 27 intentions were defined based on being concrete and causing environmental impact. Of these, 11 were new intentions, while 16 intentions are continuations from existing policy. Of the 11 new intentions, nine have an impact during the planning period and two intentions will have an impact after the planning period. For the 16 existing intentions, it was assessed whether the situation had changed, which was the case for one intention. Like the new intentions, this existing intention was also assessed in the SEA





2.2 Ten intentions that were assessed in the SEA

In total, ten intentions were assessed in the SEA:

1. Moderate Peak Water Level Management IJsselmeer Region

Most of the water in the IJsselmeer is normally drained via the sluices in the Afsluitdijk and in the future also with pumps. If the wind is unfavourable, water cannot be drained from the IJsselmeer to the Wadden Sea for a longer period. This means that the water level rises, causing a peak. If there are limited drainage possibilities and high inflow of water over a long period, the water level can rise significantly. In the case of Moderate Peak Water Level Management IJsselmeer Region, the required pump capacity and the necessary dike improvements are used in balance.

2. Strategy Climate-Proof Freshwater Supply Main Water System

The freshwater supply to the western Netherlands is maintained by gradually expanding the emergency supply from the Lek and the Amsterdam-Rhine Canal. 'Smart water management' is used to oppose salinisation, in places like the Hollandsche IJssel, the Amsterdam-Rhine Canal, the North Sea Canal and the weir at Hagestein.

3. Active Groundwater Storage Management

Recent summers have featured unusually long dry periods, leading to drought and national water shortages. The drought is mainly noticeable on the elevated sandy soils in the south and east of the Netherlands, after which no supply from the main water system is possible. Where possible, water managers focus on recovery via water and water level management. This aims at a supported and integral approach.

4. Programme of Measures River Basin Management Plans 2022-2027

To achieve the WFD objectives, measures are described in the River Basin Management Plans 2022-2027. These measures can be divided into area-based measures, basic measures (= generic = national policy) and additional measures. Incidentally, many of the measures are a continuation of current policy.

5. Programmatic Approach to Major Waters

The Programmatic Approach to Major Waters (PAGW) focuses on future-proofing major waters in which high-quality nature exists alongside a strong economy. The rationale for PAGW is to prevent (potential) deterioration in both ecological water quality and in the conservation of species and habitats and the lack of space for inclusion of measures for other societal challenges. The objective is a stable and cohesive ecological network of major waters, in which space is created for economic dynamics. The total programme of measures for major waters consists of 33 projects. The focus of these measures is on improving the ecological water quality, creating lost and missing habitats and making connections between the major waters and the inlying nature areas in the south-westerly delta, the IJsselmeer region, the Wadden Sea (incl. Ems-Dollart) and the Rhine and Meuse.

6. No Sale of Sand from Navigation Channel Maintenance Wadden Region

Sand extraction in the Wadden Sea is only allowed if a permit has been granted for local coast protection measures or if it is necessary for the maintenance of existing navigation channels. Until recently, sand extracted from navigation channel maintenance (nautical dredging) was sold on the market. This practice will now end. In the long term, sand extraction affects the Wadden Sea, particularly in the ability of the Wadden Sea to keep pace with rising sea levels. In addition, sand extraction affects erosion of the North Sea coastal zone.

7. Designating Areas for Wind at Sea

New wind energy areas which are spatially designated will together provide at least 27 GW of installed power generation capacity. This is a specification of what was agreed in the Dutch North Sea Agreement (*Noordzeeakkoord*). The total surface area of search areas, including the unused existing wind energy areas, is approximately 8,500 km². Designating around half of this area provides space for 27 GW. That includes the area for the spatial fit, because most search areas are bigger than strictly necessary for wind farms alone. Furthermore, some extra search space is available on the map for optimal demarcation of wind energy areas. Several corridors in the search areas have already been taken into account. Also, if more than half of the area is designated as a wind energy area, the possibilities for optimal spatial integration in the wind energy areas will increase. The SEA provides an analysis of the eight search areas shown. The corners of the playing field are also explored for the various options (variants) to designated wind energy areas from the set of search areas.

8. Infrastructure for CO₂ Storage in Empty Gas Fields in the North Sea

If CO₂ production is taking place somewhere, the CO₂ which is produced in a factory or power plant can be captured, liquified and transported by ship or pipelines to storage places. These might be empty oil and gas fields or underground aquifers. To facilitate CO₂ capture and storage, a new pipeline infrastructure is partially required.

9. MSFD Restrictions on Fisheries

The European Marine Strategy Framework Directive (MSFD) focuses on the protection, conservation and recovery of the marine environment (a good environmental situation), whereby sustainable use of the North Sea is also promoted. The Netherlands elaboration involves an updating of the programme of measures (Marine Strategy part III). The measures for soil protection have a spatial impact. These relate to exemptions for fisheries (causing seabed disturbance) in parts of the North Sea, totalling 8,032 km².

10. Upscaling Rijkswaterstaat's Area for Generating Sustainable Energy

Rijkswaterstaat, the executive agency of the Ministry of Infrastructure and Water Management, makes areas available to the market for the generation of sustainable energy by and for third parties. After the first ten pilot projects, in the NWP the Government has chosen to upscale the generation of sustainable energy on state territory resulting in an exploration of approximately 80 locations, at least half of which are expected to be developed into actual projects.

3 METHOD OF ASSESSING THE INTENTIONS AND THE ENTIRE NWP

3.1 Six objectives are key in the water policy

The NWP is a policy plan at a high abstraction level. For that reason, the SEA prioritises the objectives of the water policy: it tests the extent to which the water objectives are achieved. These water objectives are derived from the standards emerging from legislation and from the national interests described in the National Strategy on Spatial Planning and the Environment (*Nationale Omgevingsvisie*, NOVI). The intentions and the entire NWP have been assessed for the impact on the specific objectives of the water policy. Failure to achieve objectives can be a reason for additional measures.

Six water objectives have been determined:

1. **Climate adaptation:** A climate-proof and water-robust spatial organisation: protection of infrastructure, reduction of harvest damage, a climate-proof natural system, a climate-adaptive built environment and limitation of heat stress.
2. **Flood risk management:** Protection from flooding from rivers, lakes and the sea.
3. **Freshwater:** Sufficient freshwater stocks from lakes, rivers and canals and from areas without water supply from Rhine or Meuse and the desired salinity gradient in rivers, canals and delta waters.
4. **Quality of surface water:**
 - a. WFD objectives for the ecological water quality of national and regional waters in 2027.
 - b. WFD objectives for chemical substances in national and regional waters in 2027.
 - c. Challenges from the Delta Approach to Water quality: Pesticides, Pharmaceutical residues, Emerging contaminants, Microplastics.
 - d. Quality objectives for the function swimming water in national waters.
 - e. Objectives/quality requirements for collection of surface water for drinking water production.
 - f. Appropriate hydrological situation for Natura 2000 targets.
 - g. Appropriate hydrological situation for other nature objectives in national waters (NNN *Natuurnetwerk Nederland*, type protection).
 - h. Objectives of the MSFD for a clean, healthy and nature-rich North Sea.
5. **Groundwater**
 - a. WFD objectives for a good quantitative and chemical condition of groundwater bodies in 2027.
 - b. Appropriate hydrological situation for groundwater-dependent Natura 2000 targets.
 - c. Objectives of the Groundwater Directive (*Grondwaterrichtlijn*), insofar as additional to the WFD (chemical parameters).
6. **Shipping:** Sufficient robustness and accessibility of national waters for the facilitated shipping class and sufficient nautical safety on national waters.

3.2 Other assessments

Besides the assessment of the water objectives, other assessments were also conducted for the new intentions:

- a. the potential (cumulative) effects in various areas were considered
- b. an appropriate assessment was performed which focused on the influence of intentions on conservation objectives in the framework of the Nature Conservation Act (*Wet Natuurbescherming*)
- c. the risks and opportunities of intentions were identified for which environmental impact occurs after the planning period
- d. the spatial claims emerging from the intentions and their relations to other spatial claims in the water domain and beyond (NOVI) were identified.

4 BASELINE SCENARIO WATER OBJECTIVES AND AREAS

4.1 Baseline scenario for Environmental Assessment

In Environmental Assessment, defining the baseline scenario is important. According to the EA system, baseline scenario means: the current situation, plus the autonomous development during the planning period up to 2027 inclusive. The baseline scenario is charted for the six national water objectives and for the ten sub areas addressed in the SEA. It should be said that the NWP largely consists of an existing policy which is part of the baseline scenario.

4.2 Baseline scenario for the six water objectives

1. Climate adaptation

As a densely populated country, largely situated below sea level, the Netherlands is vulnerable to the consequences of water problems, heat, drought and flooding. Climate change increases the probability of these consequences and can, more than in the past, cause extensive damage in urban and rural areas. Climate adaptation sets 2027 as a clear reference point, because the strategy extends over decades. A few examples being worked on are:

- In 2050, the networks, including the main waterway network, must be climate proof.
- Reduction of the economic damage caused by drought in various sectors.
- International coordination regarding the low water on the Rhine and Meuse.

2. Flood risk management

Everyone living behind a primary flood defence system will get at least a basic protection level of 1 to 100,000 per year. If there is a risk of large groups of victims and/or extensive economic damage and/or serious damage resulting from the failure of vital and vulnerable infrastructure of national importance, extra protection will be provided. Primary flood defence systems protect the Netherlands from flooding from the sea, big rivers and lakes. In 2050, these must fulfil the statutory norms.

Some memorable sections from the flood risk management policy are:

- For most of the Dutch coast, every six years a basic coastline will be determined, which is partly maintained with sand suppletion. The minimum coast foundation to be maintained is also determined.
- More than half of the primary flood defence systems (around 1,700 to 1,800 kilometres) are not expected to fulfil the new norms. The Flood Protection Programme (HWBP) aims to have strengthened all these flood defence systems in a frugal and expedient way by 2050.
- The legal foundation for coordination between countries with respect to flood risk management is the Floods Directive. International coordination takes place in the international river committees, which adopt the international parts of the Flood Risk Management plans in the flood protection work groups.

3. Freshwater

Sufficient freshwater is crucial for many societal functions. In the event of water shortages, a displacement series applies which determines which sectors are given priority. During long periods of drought and/or low river discharge, Rijkswaterstaat ensures the availability of water from the main water system, for example from the IJsselmeer and Markermeer lakes. With the Smart Water Management programme, the potential of the water system is optimally used, among others by sending the water to places where it is most needed. The drinking water supply in the Netherlands is highly rated. Towards 2030, however, the volume and the quality of the drinking water supply may come under pressure due to increased demand. In combination with hotter, drier summers and water quality problems, this may eventually lead to shortages of drinking water. As a result of water shortages in regional water systems, water availability for agriculture and nature has increasingly become an issue in recent years. Due to water shortages, soil subsidence, particularly in peat areas, will become a greater problem in the future.

4. Quality of surface water

In all the countries in the European Union, the WFD applies for the quality and quantity of the water. For the improvement of the chemical and ecological water quality, every six years the government drafts River Basin Management Plans. The regional and local water managers draw up water plans, water programmes and water management programmes. The descriptions of the current situation, the water quality assessments from early 2020, the policy (including adopted objectives) and the programme of measures as included in the above-mentioned (draft) water plans provide the basic scenario for this SEA.

The ecological quality of surface waters is experienced as reasonable. With the implementation of WFD measures up to 2027 inclusive, and other design and management measures (PAGW, Natura 2000 management plans, HWBP), the ecological quality will further improve. In particular, large-scale system interventions, as described in PAGW, are required to ensure the good ecological function of the surface waters. For the national waters, an integral approach will be taken based on WFD, Natura 2000 and PAGW. Besides the above, other specific existing programmes and plans are important, like the Eel management plan based on the European Eel Regulation, nature-friendly banks and fish migration provisions such as partially opening the Haringvliet sluices.

As with the Flood Risk Management plans, for the River Basin Management plans, international coordination will also take place with other countries which are part of the river basins of the Rhine, Meuse, Ems and Scheldt. There is a Rhine Action Plan 2040 which states that in 2027, all the barriers will have been removed and migrating fish can move freely up the Rhine to Switzerland, emissions from micropollutants will fall by 30 percent and that ways will be found to increase the sponge effect of the river, now that the Rhine increasingly resembles a rain-fed river instead of a river fed by melt water. There is also the Warning and Alarm System for calamitous pollution.

5. Groundwater

Sufficient, clean groundwater is important for drinking water, nature, agriculture and industry. The provinces are responsible for implementing the deep groundwater, while the water boards and (in urban areas) the municipalities are responsible for the shallow, phreatic groundwater. The Dutch Government's Structure Vision Subsoil (*Structuurvisie Ondergrond*) has a relationship with groundwater because it imposes demands on the use of the deeper subsoil, for example by using as much of the potential for geothermal and excluding the extraction of shale gas.

The quality is assessed at the level of the 23 water masses identified in the Netherlands in one or more soil layers, the so-called bodies of groundwater. According to the most recent report (from 2020), most bodies of groundwater fulfil the objectives set for the general chemical condition. A national inventory from 2017 shows that nearly all the analysed shallow groundwater and two-fifths of the deep groundwater contain chemicals which originate from humans. Throughout the country, pesticides were found in half of the groundwater samples. In groundwater, diffuse pollution by historic contamination plays a role: due to human activities, the groundwater is polluted to increasing depths with many different substances.

6. Shipping

A substantial amount of freight transport takes place over the (main) navigation network. For cross-border transport, this amounts to more than 40%. The waterways are also important for recreational use. Rijkswaterstaat manages and maintains the national waterways in the Netherlands and the civil engineering structures therein.

The national government wants to establish fast, safe, robust and sustainable waterways, targeting among others a maximum average waiting time of 30 minutes for ships at locks. Due to the growth of personal and freight transport, this could lead to capacity problems at some locks. Soil erosion combined with lower discharges caused by climate change also leads to capacity and robustness problems. The national government defined five ports as being of national importance. By means of the Green Deal with the maritime sector, the government wants to improve the sustainability of sea-going and inland navigation. Internationally, the Netherlands works closely with its neighbours and globally with other countries.

4.3 Baseline Scenario for the ten areas

1. North Sea

The NWP sets the frameworks for spatial use in the Netherlands Exclusive Economic Zone (EEZ) and the territorial sea which has not been administratively designated. The MSFD is aimed at achieving and maintaining a 'good environmental status of the marine environment', in 2020 at the latest. In general,

biodiversity is improving, except for birds, but good environmental status has not yet been achieved. There are many different activities in the North Sea:

- Many different types of fisheries are present in the North Sea.
- From the end of 2021, in the seven wind farms Egmond aan Zee, Prinses Amalia, Luchterduinen, Gemini, Borssele I and II, Borssele III and IV and Borssele V, the amount of installed power will be 2.5 GigaWatt (GW). The construction of the Hollandse Kust (south), Hollandse Kust (north), Hollandse Kust (west), Ten Noorden van de Wadden and IJmuiden Ver wind farms until 2030 will add another 8.3 GW of installed power. TenneT has installed sea platforms and cables for the connection of the wind farms to the high voltage grid on land.
- Studies and pilots are being conducted for tidal and solar energy production, hydrogen production, artificial islands and cross-border Wind at Sea projects.
- There are around 150 oil and gas platforms on the Netherlands North Sea, some of which will be reaching the end of their economic lives within 10 to 20 years. At the same time, new fields will come into operation.
- There are plans for CO₂ storage.
- Sand will be extracted in the form of suppletion sand, fill sand, concrete and masonry sand. Over 25 million m³ per year will be extracted, half of which as suppletion sand and half as fill sand.
- A cohesive routing system for shipping has been created, including buffer zones in relation to large-scale offshore initiatives. Absolute numbers and gross transported tonnages are rising.
- There is a military shooting range, flying area or exercise area for placing and detecting mines. Coordination about the North Sea Region Programme with the relevant other countries takes place based on the Espoo Convention about environmental impact assessments in cross-border contexts and international coordination also takes place based on the MSP guideline.

2. Coastal zone

Sand suppletions tackle structural coastal erosion. Every four years, the maintenance programme is reviewed. The sand suppletions are also part of the baseline scenario. In 2024, the plans for the next period will be established.

In the Coastal Pact, governments and nature organisations, drinking water companies and the leisure and tourism sector work together on the openness of the coast and for a good balance between protecting and conserving the values of the coasts on the one hand and developing the coast on the other.

3. The Southwest Delta

This area in Zeeland, West-Brabant and the southern part of Zuid-Holland features waters which vary from freshwater to saltwater and from stagnant to tidal water. The Delta works brought flood risk management. However, due to the flood defences and dams, the water quality has deteriorated and the unique estuarine nature has been affected. Now the Southwest Delta consists of several isolated water basins, each with their own water quality problems. An enormous part of the water areas has the status of Natura 2000 area. The natural environment has international allure and is important for many water and migratory birds.

4. Rhine-Meuse Delta

The Rhine and the Meuse come together in the Rhine-Meuse Delta. The northern part of the area is densely populated, while the southern part (Biesbosch, Hollandsch Diep and Haringvliet) is less densely populated and more focused on nature, agriculture and recreation. The salt water can enter via the Nieuwe Waterweg and the system undergoes tidal action. Some of the waters have the status of Natura 2000 area. The area has 4 closable storm surge barriers (the Maeslant Barrier, Haringvliet sluices, Hartelkering barrier and the Hollandsche IJsselkering). Salinisation from the sea needs to be addressed by keeping enough freshwater. In January 2019, the Kierbesluit was implemented and the Haringvliet sluices were opened slightly for the first time to enable migratory fish to enter the Haringvliet. In the coming years, more steps will be taken in learning how to implement a new operation protocol.

5. Rivers

The major rivers are the central axes of the main water system in the Netherlands and are extremely valuable for spatial quality and nature. Many flood plains in the rivers have been designated as Natura 2000 areas. The rivers also form an important link in (international) commercial shipping connections. As a result of riverbed erosion, the summer bed of large sections of the rivers become increasingly deep. This can lead

to obstructions in the navigation channel, deterioration of nature and instability of structures. The rivers are largely free flowing, but there are also weirs. Furthermore, almost all the types of use play a role in the river area. The objective is to establish a policy choice for the riverbed depth, water discharge and the adjustment of the infrastructures of the Integral River Management programme, for which a separate SEA will be drafted.

6. IJsselmeer region

The IJsselmeer region supplies the neighbouring region with freshwater. This is regulated, among others, by the Water Level Ordinance IJsselmeer region. The IJsselmeer region has a flexible water level. The water is drained using a combination of locks and pumps (locks where possible, pumps where necessary). For flood risk management, it has been established that the average winter water level of the IJsselmeer, Markermeer and Randmeren lakes will remain at the current level until 2050. In the planning period, the lock at Kornwerderzand will be enlarged and the navigation channels will be maintained at the necessary depth for deeper ships. The Afsluitdijk will be further reinforced.

7. Wadden region

The policy in the NWP for the Dutch Wadden region focuses on maintaining the buffer effect of islands, outer deltas and intertidal area. The sandy system of the island coast remains in balance with rising sea levels through beach nourishment and dynamic dune management. The area plays an important role for (migratory) birds, fish and seals. The Wadden Sea is also used for recreation, fisheries, gas and salt extraction and shipping.

8. Canals

Canals are artificial waterways with a regulated water level management for shipping. They are also important for water management and functions like drinking water, nature, industry, horticulture and agriculture. There are various canal areas, each with different specific regional circumstances. The Amsterdam-Rhine Canal supplies the western Netherlands with freshwater and the Midden Limburg and Noord Brabant canals are important for the water supply of the elevated sandy soils in the southern Netherlands.

9. Elevated sandy soils

On the Elevated Sandy Soils (parts of Noord-Brabant, Limburg, Gelderland, Overijssel and Drenthe), almost no water can be supplied from the main water system. The sandy soils therefore rely on rainwater and groundwater. With the new insights from the dry summers of 2018 and 2019, a preferred sequence for freshwater and drought has been drawn up (Delta programme and the policy on drought), with the main theme being: a smart spatial organisation which takes into account water, better retention of water and controlling and accepting the residual risk.

10. Low-lying Netherlands

The low-lying Netherlands roughly comprises the drained part of the Netherlands in Zeeland, Zuid-Holland and Noord-Holland, Rivers region, Utrecht, Flevoland, Friesland, Overijssel, Drenthe and Groningen. There are three main problems here: salinisation, soil subsidence and flood risk management.

5 ASSESSMENT OF ACHIEVEMENT OF WATER OBJECTIVES BY THE INTENTIONS

Table 1 Relationship between intentions and water objectives

- = there is a negative relationship, 0 = there is a neutral relationship, + = there is a positive relationship, n/a = there is no relationship

Intention	Climate adaptation	Flood risk management	Freshwater	Quality of surface water	Groundwater	Shipping
Moderate Peak Water Level Management IJsselmeer Region	+	0	n/a	0	n/a	n/a
Strategy Climate-Proof Freshwater Supply Main Water System	+	n/a	+	+	+	-
Active Groundwater Storage Management	+	n/a	+	+	+	n/a
Programme of Measures for River Basin Management Plans 2022-2027	+	+	0	+	n/a	n/a
Programmatic Approach to Major Waters	+	n/a	+	+	n/a	n/a
No Sale of Sand from Navigation Channel Maintenance in Wadden Region	+	+	n/a	0/+	n/a	n/a
Spatial Reservation 27 GW Wind at Sea	n/a	n/a	n/a	0	n/a	0
Infrastructure for CO ₂ storage in Empty Gas Fields in the North Sea	n/a	n/a	n/a	0	n/a	n/a
MSFD Restrictions on Fisheries	n/a	n/a	n/a	+	n/a	n/a
Upscaling Rijkswaterstaat's Area for Generating Sustainable Energy	n/a	0	n/a	0/-	n/a	-

Moderate Peak Water Level Management IJsselmeer Region contributes to climate adaptation with respect to water problems. To protect the infrastructure from extreme weather conditions, it is a good idea if both strategies, pumps or further dike improvements, are executed in balance and can be further elaborated in the longer term. It also has a beneficial effect on the closure frequency of the movable flood defences and the water discharge from the regional waters is positively affected. The probability of flooding around the IJsselmeer does not change with respect to the baseline scenario. There is no impact on the water quality of the surface water because the measure does not involve any changes in the composition of the water.

Strategy Climate-Proof Freshwater Supply Main Water System leads to more robust responses to drought situations which have consequences in the western and central region of the Netherlands. However, postponing salinisation via the Nieuwe Waterweg for as long as possible will be abandoned. In the case of low discharge and threatening salinisation, the aim in each situation will be to maintain the freshness of the strategic freshwater stores, which will then supply freshwater and drinking water. The 'free flow' of water via the Strategy Climate-Proof Freshwater Supply Main Water System offers opportunities for nature, for example by using some of the Rhine discharge to keep the Kier in the Haringvliet open for longer and/or

expand the estuarine dynamics. It also offers opportunities for fish ladders at other locations, for example at Schellingwoude, which is now often closed to save water during droughts. Because the intention also focuses on supplying freshwater to Zuid-Holland, it will be easier to maintain the level of groundwater stores. The measures lead to negative effects on shipping, although the extra costs involved for shipping are limited compared to the extra costs that will already be incurred in the event of a low water situation due to climate change. Depending on the necessary flow rates, there are also negative effects on the accessibility for shipping and nautical safety.

Active Groundwater Storage Management focuses on responding to the consequences of climate change, particularly long periods of drought. This contributes to reducing the loss of species and habitat due to climate change. By raising the water storage capacity underground, saving water and adapting to the new availability, more water is available for longer during periods of shortages for various purposes like agriculture, drinking water or industry. This is very positively valued for the objective of freshwater availability. Due to the recovery of groundwater levels in the stream valleys, and particularly the reorganisation of stream valleys by increasing the groundwater storage and constructing green-blue structures in the urban area (buffers), drying out of waterways in times of long-term drought is restricted. Active Groundwater Storage Management supplements the groundwater stock.

Programme of Measures River Basin Management Plans 2022-2027 limits the decline in species and habitats resulting from climate change. It contributes to flood risk management because secondary channels and flood plains contribute to the water-bearing and storage capacity, whilst reducing the normative high-water levels. Secondary channels and flood plains are the first to run dry in times of low water, meaning that they do not contribute to the freshwater stocks. There is a positive impact on the ecological objectives and chemical norms. Nature-friendly banks and secondary channels lead to changes in the flow dynamics and morphology in the rivers, with a positive impact on the physical-chemical water quality (nutrients management, oxygen level) and on the ecological water quality. The implementation programmes in the area dossiers for collection points from surface water help guarantee a sufficiently good quality of surface water for the supply of drinking water. By providing seagrass, tidal nature and salt marshes, the physical-chemical water quality changes in the areas and waters which are affected by the tide. In various places, the seawater mixes with the freshwater, creating brackish water systems. The tide/current in the area will also produce sedimentation and erosion, which has been positively assessed for ecological water quality. By creating a more gradual transition, the exchange options between land and water for various species increase (more biodiversity). The measures strengthen the achievement of objectives for WFD, Natura 2000 and PAGW. Fish migration provisions contribute to the exchange options for species.

Programmatic Approach to Major Waters helps make the ecosystems robust and reduces the loss of species and habitat due to climate change. The PAGW projects do not result in an increase of salinisation or reduced freshwater availability. In the Getij Grevelingen project, the already salty water of the Grevelingenmeer is only refreshed on a large scale to improve the underwater nature. However, this project does lead partially to a higher level of the (already) salty water. For the Wieringerhoek project, the principle to preserve the freshwater provision will be continued and it may possibly limit the saltwater seepage and discharge of brackish outlet water from Noord Holland. In this way, Wieringerhoek helps tackle the salinisation of the IJsselmeer. The measures contribute to the WFD objectives, the objectives from the Delta Approach to Water Quality and a more robust and natural ecosystem, and to achieving ecological water quality objectives. No impacts are expected on chemical water quality. Effects on groundwater levels and quality will be local and limited.

No Sale of Sand from Navigation Channel Maintenance Wadden Region ensures that the Wadden region can keep pace with rising sea levels in the long term. It reduces the erosion of the North Sea coastal zone and reduces the sand appetite of the Wadden Sea, meaning that less coastline care will be necessary.

Spatial Reservation 27GW Wind at Sea does not have negative effects on the water quality. Shipping may experience problems, but there is so much space in the eight search areas that with an adapted design and mitigating measures, it should be possible to reduce the risks to an acceptable level.

Infrastructure for CO₂ storage in Empty Gas Fields in the North Sea leads locally to temporary construction effects but does not result in changes in the composition of the water and has no substantial effect on the six water objectives.

MSFD Restrictions on Fisheries ensure less disturbance of the seabed, which results in less cloudy water and improvement of the ecosystem, and thus progress of biodiversity and fish stocks. It helps strengthen the natural system and achieve the nature objectives in these areas of the North Sea.

Upscaling Rijkswaterstaat's Area for Generating Sustainable Energy includes the construction of wind turbines on existing flood barriers, dikes or dams. Dikes may also be unsuitable for the construction of solar farms, and solar farms may cause additional backwater when placed in the riverbed. The projects should be implemented within the existing frameworks of flood risk management. This ensures that this intention does not cause any risks to the flood risk management objective. Solar and wind farms may affect the quality of the surface water because solar panels may affect the light and temperature of surface water. There may be a limited effect on shipping because implementation must be performed without negatively affecting the primary functions of the water. Some circumnavigation may be necessary.

6 ASSESSMENT OF ACHIEVEMENT OF NWP OBJECTIVES

The influence of the water objectives by the entire NWP has also been determined. The situation relating to the six water objectives is summarised below.

1. Climate adaptation

Moderate Peak Water Level Management IJsselmeer Region provides better protection against excess water resulting from extreme weather. The Strategy Climate-Proof Freshwater Supply Main Water System and the Active Groundwater Storage Management limit the effects of drought. Programme of Measures River Basin Management Plans 2022-2027 and Programmatic Approach to Major Waters contribute to the climate adaptation objectives for reducing the loss of species and habitats.

2. Flood risk management

The NWP builds on existing strategies (most used after the Delta decision 2013). Moderate Peak Water Level Management IJsselmeer Region and the Programme of Measures River Basin Management Plans 2022-2027 have a positive impact on flood risk management. No effects on the scope of flood risk management are expected from the other intentions from the NWP. No risks are therefore expected for the total scope of flood risk management.

3. Freshwater

The existing freshwater policy will be further continued. The Strategy Climate-Proof Freshwater Supply Main Water System contributes to the objective for freshwater. In the areas where supply of water from the rivers is not possible without rigorous interventions, the focus is on retaining water and keeping up groundwater levels. The proposed measures to safeguard sustainable drinking water supplies and sufficient availability of freshwater contribute towards the objectives for freshwater.

4. Quality of surface water

Various current (policy) programmes or programmes to be started before or during the planning period 2022-2027 contribute towards quality improvement of the surface water.

However, the National Water Quality Analysis (*Nationale Analyse Waterkwaliteit*) drawn up by the Netherlands Environmental Assessment Agency (*Planbureau voor de Leefomgeving*, PBL) shows that for both the ecological and chemical water quality, the measures are insufficient to comprehensively achieve the set objectives before or after 2027. For example, nutrients for part of the regional waters remain a bottleneck. In addition, design and management of water systems must be further improved in most places in the coming planning period to reach the targeted level for fish and water plants. For the national waters, almost 100% of the target for ecological water quality is expected to be achieved, but for the regional waters, for which the national government has a system obligation, some of the regional waters are not expected to achieve the objective in 2027. Besides nutrients, other pollutants exceed the surface water norms. For many substances and WFD norms, there still appears to be insufficient knowledge of the trends and sources. It is important to have that knowledge before measures can be taken. From the Delta Approach, several other substance groups have been mentioned: pharmaceutical residues, microplastics and emerging contaminants. The approach varies per substance group. The PBL raises concerns about whether the objectives can be achieved with the current approach. The policy relating to these substances might benefit from a more integral approach across different substance groups and compartments (surface water, groundwater, soil). It is uncertain whether the approach based on the Future Vision Pesticides 2030 (*Toekomstvisie Gewasbescherming 2030*) and other policy measures already being taken will be sufficient to meet the norms for pesticides everywhere.

Considering the findings of the PBL and the uncertainties described above about the target in 2027, for the target on the theme surface water quality, several building blocks for supplementary policy have been developed in the SEA. These building blocks for supplementary policy consist of several extra proposed measures on top of the existing and proposed package, focused on the entire scope of the water quality challenge: ecological and chemical water quality objectives for both WFD and Delta Approach to Water Quality.

Policy relating to the water quality in the North Sea consists of the Marine Strategy Framework Directive. The objectives and existing approach will be largely continued. Of the new intentions, outside the amendments to Marine Strategy Framework Directive, positive effects on the water quality in the North Sea are particularly expected from the manure policy. With the supplementary measures for soil protection, it is expected that the Objectives Marine Strategy Framework Directive will be achieved.

5. Groundwater

For groundwater, there are mainly ongoing bottlenecks in the suitability of groundwater for groundwater-dependent surface water, groundwater-dependent nature and for drinking water extraction. According to forecasts, the regional groundwater problems will only be improved to a limited extent, but in around 50% of the groundwater bodies there is a regional problem, as a result of the quality of the groundwater. In most cases, this is due to excess nutrients and pesticides, besides chloride, metals and ammonium. Groundwater as source for drinking water production is also under increasing pressure due to nutrients, pesticides and contaminants of emerging concern. These include (animal) medicines, industrial substances and substances from consumer products. Increased activity in the subsoil, such as thermal energy storage, can have an impact on the drinking water resources. In groundwater, diffuse pollution by historic contamination also plays a role. Due to human activities, the groundwater is polluted to increasing depths with many different substances. Strategy Climate-Proof Freshwater Supply Main Water System and Active Groundwater Storage Management positively impact groundwater. In the National Water Quality Analysis, the PBL indicates that existing policy and the proposed measures focused on groundwater and substance policy will not be sufficient to meet the target in 2027. With the measures from the NWP and provincial policy, it is expected that it will not be possible to achieve all the objectives for groundwater quality and quantity.

The objectives for groundwater overlap to an important extent with the objectives identified by the PBL in other aspects of water quality. In cohesion with the quality of surface water, building blocks for supplementary policy will therefore be developed.

6. Shipping

The aim for shipping is to safeguard and achieve a smoothly and safely operating, robust and sustainable mobility system. This will be addressed and continued in the Multi-annual Programmes for Infrastructure, Space and Transport (MIRT) and the Programme Replacement and Renovation of Water Infrastructures. The Strategy Climate-Proof Freshwater Supply Main Water System has negative effects on achieving the target for shipping in situations with low discharges. This will be integrally addressed in IRM, for which a SEA will also be drafted.

7 BUILDING BLOCKS FOR SUPPLEMENTARY POLICY

Due to the pressure identified on the objectives for surface water quality and groundwater, building blocks for supplementary policy have been explored. These building blocks for supplementary policy consist of a collection of measures which could help meet the target. This concerns a combination of process-based intentions, amending legislation, new measures or intensifying existing measures. A possible adjustment of the objectives was also studied. The building blocks for supplementary policy comprise 15 measures which can be implemented by the four water managers State (EU), Provinces, Water boards and Municipalities.

- Ecological WFD objectives and Delta Approach to Water Quality (part nutrients): Enhanced focus on natural organisation and functioning of regional (surface) water systems, Maximise focus on Delta Plan Agricultural Water Management - oblige or force participation, Acceleration and rollout of revised manure policy, Strengthen monitoring and enforcement of manure policy, Elaborate water quality in eco-regulations of EU Common Agricultural Policy (including expansion of buffer zones and limitation of phosphate leaching), Focus on use of space for (ground)water quality, Expand wastewater treatment of nutrients in water purification plants.
- Chemical WFD objectives, drinking water and other chemical water quality objectives (Delta Approach to Water Quality): Tighten substance policy and policy for environmentally harmful materials in other policy domains than water, Focus on use of space for (ground)water quality, Tighten admission and application policy pesticides, Strengthen monitoring and enforcement of pesticides, Extra treatment of ladder for wastewater treatment, Acceleration and rollout of revised manure policy (relationship with animal hormones, medicines and other micropollutants in manure), Focus on use of space for (groundwater) quality, Adjust policy and operations for discharge into water bodies (direct and indirect discharge).

The following comments should be made here: The National Water Quality Analysis was based on joint fact finding with the water managers. It provides a snapshot of certainties in policy and approach at that moment (2019 and early 2020). Since then, policy preparations have started for several policy aspects, which contribute to the building blocks for supplementary policy.

If all the measures for the Building Blocks for supplementary policy are implemented, the situation of the water objectives Quality of surface water and Groundwater will improve, in the sense that the risk of not achieving the water quality objectives for surface water and groundwater will be substantially reduced for a wide range of problem substances (including nutrients, pesticides, veterinary medicines, microplastics, micropollutants, pharmaceutical residues, emerging contaminants) and the probability is also increased of achieving the ecological objectives.

As a final remedy, two instruments can still be used, which realistically means that the objectives for quality of surface water will be adjusted:

1. **Use article 4.5 WFD:** The WFD stipulates that the objectives must be scrutinised again every planning period. It is therefore possible to adjust the objectives with each version of the Catchment Area Management Plan. In the European Water Directors Consultation, it has now been decided that member states only need to defend phasing or reduction of objectives at the end of a planning period. In this way, any shortcomings in achieving the WFD objectives can be defended and reasoned in retrospect, due to the fact that insufficient measures are available, the package of measures is too expensive, or natural circumstances prevent it. Being 'too expensive' is a political decision based on economic information such as cost-benefit analysis of measures.
2. **Coordinate WFD objectives and Natura 2000 targets for surface waters:** As an amended ambition, it may be that WFD objectives are adjusted for ecological water quality and nutrients to the desired conditions for the Natura 2000 target for surface waters. However, this is a long and difficult legal trajectory, with little chance of success.

8 OTHER ASSESSMENTS

In the SEA NWP, achieving the six water objectives is key. A different view was also taken of the NWP and the ten intentions. This involved analysing the environmental effects which are not addressed in the water objectives and studying the effects of the relevant intentions for each area. An appropriate assessment was performed and an analysis of whether spatial claims could obstruct each other or the NOVI priorities.

8.1 Environmental impacts

Because Moderate Peak Water Level Management IJsselmeer Region resembles the baseline scenario, there are few noteworthy environmental effects. The main environmental effects of the Strategy Climate-Proof Freshwater Supply Main Water System are that the sea water intrusion in/from the Nieuwe Waterweg may reach further upstream. On the other hand, maintaining the freshwater nature of the polders in western Netherlands benefits various functions. Active Groundwater Storage Management has great benefits for nature, soil and various uses, such as tackling desertification of nature and soil subsidence as well as the decay of foundation piles in buildings, increase in available water for agriculture and industry and tackling the drying out of waterways. The Programme of Measures River Basin Management Plans 2022-2027 and the Programmatic Approach to Major Waters (PAGW) also positively impact the same aspects, but also for the fisheries and for the landscape. The intention No Sale of Sand from Navigation Channel Maintenance Wadden Region has positive effects on nature and reduces soil subsidence. The intention Spatial Reservation 27 GW Wind at Sea mainly affects nature and various types of use such as fisheries and mining. The Infrastructure for CO₂ storage in Empty Gas Fields in the North Sea can have an impact on habitats. In combination with existing reservations for pipelines, the impact on other uses can be limited and is positive in terms of sustainability (CO₂ reduction). The MSFD Restrictions on Fisheries have a positive impact on nature and the soil and are negative for professional fisheries. Upscaling Rijkswaterstaat's Area for Generating Sustainable Energy can harm nature due to local changes in the water under floating solar panels and during construction and operation of wind turbines. However, piles and riprap can also be a welcome addition to the underwater environment. Negative effects can also occur with other types of use.

8.2 Assessment per area

In the North Sea the intention Infrastructure for CO₂ Storage in Empty Gas Fields in the North Sea focuses on the empty gas fields near the coast. The intentions Spatial Reservation 27 GW Wind at Sea and MSFD Restrictions on Fisheries are further off the coast and could influence each other. In the Southwest Delta, the Programmes of Measures River Basin Management Plans 2022-2027, the Programmatic Approach to Major Waters (PAGW) and Upscaling Rijkswaterstaat's Area for Generating Sustainable Energy could influence each other. The first two strengthen each other because both programmes aim at improving the water quality. Upscaling Rijkswaterstaat's Area for Generating Sustainable Energy only has a local impact. In the Rhine-Meuse Delta and in the Rivers, the same intentions apply as in the Southwest Delta, but the Climate-proof Freshwater Supply Strategy can also contribute to the functioning of the regional measures from the River Basin Management Plans. In the IJsselmeer region, the same four intentions apply as well as the Moderate Peak Water Level Management IJsselmeer Region. For Moderate Peak Water Level Management IJsselmeer Region, no interaction is expected with the intentions from the National Water Programme 2022-2027. This is because Moderate Peak Water Level Management IJsselmeer Region has a sporadic, limited and temporary character. In the Wadden region, the Programmatic Approach to Major Waters and the intention No Sale of Sand from Navigation Channel Maintenance Wadden Region do apply, but because they are situated in different parts of the Wadden Region no interaction is expected. In the area of the Canals the Climate-proof freshwater supply main water system and Programme of Measures River Basin Management Plans 2022-2027 apply. Finally, there are two areas where only one intention plays a role, namely the Netherlands Elevated Sandy Soils (Active Groundwater Storage Management) and Low-lying Netherlands (Climate-proof Freshwater Supply Main Water System Strategy).

8.3 Appropriate assessment

It has been shown that for four of the ten intentions, the occurrence of significant effects cannot be excluded. Therefore, further study was conducted according to the so-called traffic lights method:

- a **red light** for harm to natural features which cannot be mitigated and for which performing an AIC test¹ test will not succeed either
- an **orange light** for harm to natural features which can be mitigated or for which an AIC test can be performed
- a **green light** if there is no harm to natural features or only positive effects.

Table 2 Summary of impact assessments before and after applying (mitigating) measures.

Intention	Impact assessment before measures	Impact assessment
Moderate Peak Water Level Management IJsselmeer Region		
Strategy Climate-Proof Freshwater Supply Main Water System		
Spatial Reservation 27 GW Wind at Sea		
Upscaling Rijkswaterstaat's Area for Generating Sustainable Energy		

8.4 Spatial claims

Finally, the extent to which substantial spatial claims in the water domain could 'obstruct' each other and the relationship to spatial claims from the NOVI priorities were determined:

- For intentions in the new NWP which are a continuation of existing policy, it is expected that the required space for those claims has already been organised. For some of the ten intentions which were assessed in the SEA, as well as for some of the building blocks for supplementary policy, spatial claims were expected: for Programme of Measures River Basin Management Plans 2022-2027, Programmatic Approach to Major Waters (PAGW), Designating Areas for Wind at Sea, Infrastructure for CO₂ Storage in Empty Gas Fields in the North Sea, MSFD Restrictions on Fisheries, Upscaling Rijkswaterstaat's Area for Generating Sustainable Energy and Enhanced focus on natural layout and functioning of regional (surface) water systems.
- In the water domain, no conflicting spatial claims have been indicated. This is because no other spatial claims exist from other water-related intentions or because a combination can be made with existing infrastructure or reservations which do not require much or any space, because Rijkswaterstaat determines where an intervention is permissible or because a choice has been made to give priority to a certain activity above others (Dutch North Sea Agreement).
- In the NOVI, four integral priorities are identified. The water-related intentions with substantial spatial claims are set against these. For the NOVI priority 'Space for climate adaptation and energy transition', the intentions in the NWP partly fulfil this priority and may therefore strengthen each other. However, the relationship of the NWP with the energy transition is more tense because intentions aimed at water quality and nature involve risks for conflicting spatial demands for energy transition. The NOVI priority 'Sustainable economic growth potential' can lead to an increasing demand for space for infrastructure and real estate, creating possible risks for the intentions from the water domain. Early involvement of the water managers in planning developments offers opportunities to safeguard the water interests. The NOVI priority 'Strong and healthy cities and regions' places great emphasis on housing, which can lead to conflicts with spatial demands from the water domain. Multiple use of space is an option. The NOVI priority 'Futureproof development of rural areas' is usually easily combined with water interests. Few conflicts are expected, and these can be mitigated with multiple use of space and good positioning.

¹ There are no Alternatives, there is an Imperative reason of overriding public interest and Compensation measures are taken.

9 CONCLUSIONS AND RECOMMENDATIONS FROM THE SEA AND APPROPRIATE ASSESSMENT

9.1 Water quality

It can be deduced from the PBL's National Water Quality Analysis that it may not be possible to achieve the objectives for water quality. In addition to the intentions in the NWP, 15 measures to improve water quality have therefore been elaborated in the SEA. These are called 'building blocks for supplementary policy'. In 2021, an ex-ante evaluation is planned of the River Basin Management Plans, the Seventh Action Programme under the Nitrate Directive, and the Policy Document Drinking Water. If this shows that the proposed policy will not satisfactorily achieve water quality objectives, supplementary measures are in place to be added. An annual detailed report is recommended about the progress of water quality regarding the MSFD objectives. We also recommend incorporating a well-timed evaluation moment in the planning period of the NWP in which water quality is again evaluated in cohesion with the Delta Approach to Water Quality, as recently performed in the National Water Quality Analysis.

9.2 Wind at Sea

With respect to shipping, wind farms in the search areas may produce a diverse range of risks. By designating new shipping navigation routes, clearways or corridors and with better design of the wind areas (avoid bends), the importance of accessibility for shipping can be ensured. The search areas show various results for nature and for other types of use, particularly fisheries. The process for achieving further positioning of wind areas at sea starts in 2021 and continues thereafter. The information and analyses show that the Natura 2000 conservation objectives will guide the choice. With respect to the definitive choice, a test will take place against the Dutch Ecology and Cumulation Framework (*Kader Ecologie en Cumulatie*), version 4.0. It is recommended that the Appropriate assessment drawn up with this SEA is used as a starting point.

9.3 Subsequent decisions

Following on from this SEA, several subsequent decisions will be taken which contain further elaborations of the intentions from the NWP. The trajectory is largely presented in the Milestones Overview. For these subsequent decisions, for every occasion it will have to be assessed whether an environment impact assessment will need to be conducted.

APPENDIX A: LIST OF TERMS AND ABBREVIATIONS

The terms and abbreviations in this appendix are the same as those used in the summary of Strategic Environmental Assessment for the National Water Programme 2022-2027. Several terms and abbreviations are only used on one or a very limited number of occasions and they will be explained on that occasion.

Abbreviation	Explanation
EIA	Environmental Impact Assessment
EU	European Union
HWBP	High Water Protection Programme
MIRT	Multi-Annual Programme for Infrastructure, Space and Transport
MSFD	Marine Strategy Framework Directive
NNN	Nature Network Netherlands
NOVI	National Strategy on Spatial Planning and the Environment
NWP	National Water Programme 2022-2027
SEA	Strategic Environmental Assessment (EIA at plan or programme level)

Term	Explanation
Appropriate assessment	An appropriate assessment is based on the Habitats Directive and it determines whether a project, action or plan has the potential to have significant negative effects.
Flooding	A collective term for damage, inconvenience and disruption due to high water levels as a result of excessive rainfall and/or insufficient drainage
Flood risk	The chance that an area will be flooded because the flood defence around that area will fail in one or more places
Natura 2000 areas	A European network of protected nature areas in the territory of the Member States of the European Union, based on the Habitats Directive and the Birds Directive
Reference	Situation against which the effects are analysed
River basin management plans	River basin management plans are drawn up in the context of the Water Framework Directive
ROR	European Floods Directive
Sand suppletion	Replenishment of the coastal defence strip with sand to compensate for coastal deterioration
Water systems	A coherent whole of one or more surface water bodies and groundwater bodies, with associated storage areas, water systems and associated structures

COLOPHON

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Arcadis Nederland B.V.

P.O. Box 220
3800 AE Amersfoort
The Netherlands
+31 (0)88 4261261

www.arcadis.com