

Lower Saxony Ministry of the Environment, Energy and Climate Protection

Lower Saxony contribution to the management plans 2015 to 2021 for the Elbe, Weser, Ems and Rhine river basins

pursuant to Section 118 of the Lower Saxony Water Act and Art. 13 of the EU Water Framework Directive

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Part I

Introduction

Basis and objectives of the Water Framework Directive

The Water Framework Directive (WFD), passed by the European Council and the European Parliament in the year 2000, set out environmental objectives for surface waters and groundwater in Europe. The aim is, on the one hand, to safeguard and develop good ecological status for surface waters (rivers, standing waters and transitional and coastal waters) and, on the other hand, to maintain and develop good quantitative and chemical status for the groundwater. There is also a requirement to ensure that there is no deterioration in the status of surface waters and groundwater.

Good ecological status of surface waters primarily focuses on the diversity of the existing plant and animal species. This presupposes that the water body has a near-natural structure and complies with chemical environmental quality standards. Good chemical status of surface waters means low pollutant load levels. For artificial or heavily modified surface waters with special functions that have to be taken into account under the WFD, the objectives are good ecological potential and good chemical status.

In line with the objective of good quantitative status of the groundwater, the quantities of water abstracted must not exceed the available groundwater resource. Good chemical status means groundwater properties that permit sustainable use for human purposes. There is also an obligation to reverse significant upward trends in pollutant concentrations. Moreover, adverse effects on ecosystems dependent on the groundwater are to be prevented.

In view of the water-related objectives of the WFD, overlaps exist between the WFD and Natura 2000 (Habitats Directive and Birds Directive), especially for aquatic and water meadow landscapes, because the targeted good ecological and chemical status will also have impacts on the water bodies and the dependent ecosystems as habitats for animals and plants. At the same time, the species and habitats of relevance to the WFD are also an object of nature conservation.

In addition to the two major European nature conservation directives, there is also a need for coordination with the Marine Strategy Framework Directive (MSFD) and the Floods Directive (FD). The Flood Risk Management Directive (FRMD) requires coordination with the Water Framework Directive (WFD), e.g. in the field of public involvement. With regard to coastal waters, it is also necessary to coordinate assessment of good ecological status with the requirements of the MSFD, marine monitoring and coordination of measures.

Inputs of nutrients, pollutants and waste from the river basins result in pollution of marine areas. To ensure coordinated implementation of the Marine Strategy Framework Directive and the Water Framework Directive, the Joint Water Commission of the Federal States (LAWA) has published “Recommendations for coordinated application of the Marine Strategy

Framework Directive and the Water Framework Directive[1]". Up-to-date information about the implementation of the MSFD can be found on the Internet at www.meeresschutz.info.

The management objectives of the WFD are to be achieved by protecting, safeguarding and remediating waters, taking an overall approach to river basins, ensuring public participation and paying equal attention to ecological, economic and social aspects. At the same time, the implementation of the WFD is concerned with the development of uniform European standards in relation to surface waters and groundwater.
Section 84 of the Federal Water Act (WHG) requires that the river basin management plans published at the end of 2009 are to be updated every six years (cf. Fig. 1, Article 13 WFD). The management plan is to be publicly exhibited for a minimum of six months at least one year before its entry into force.

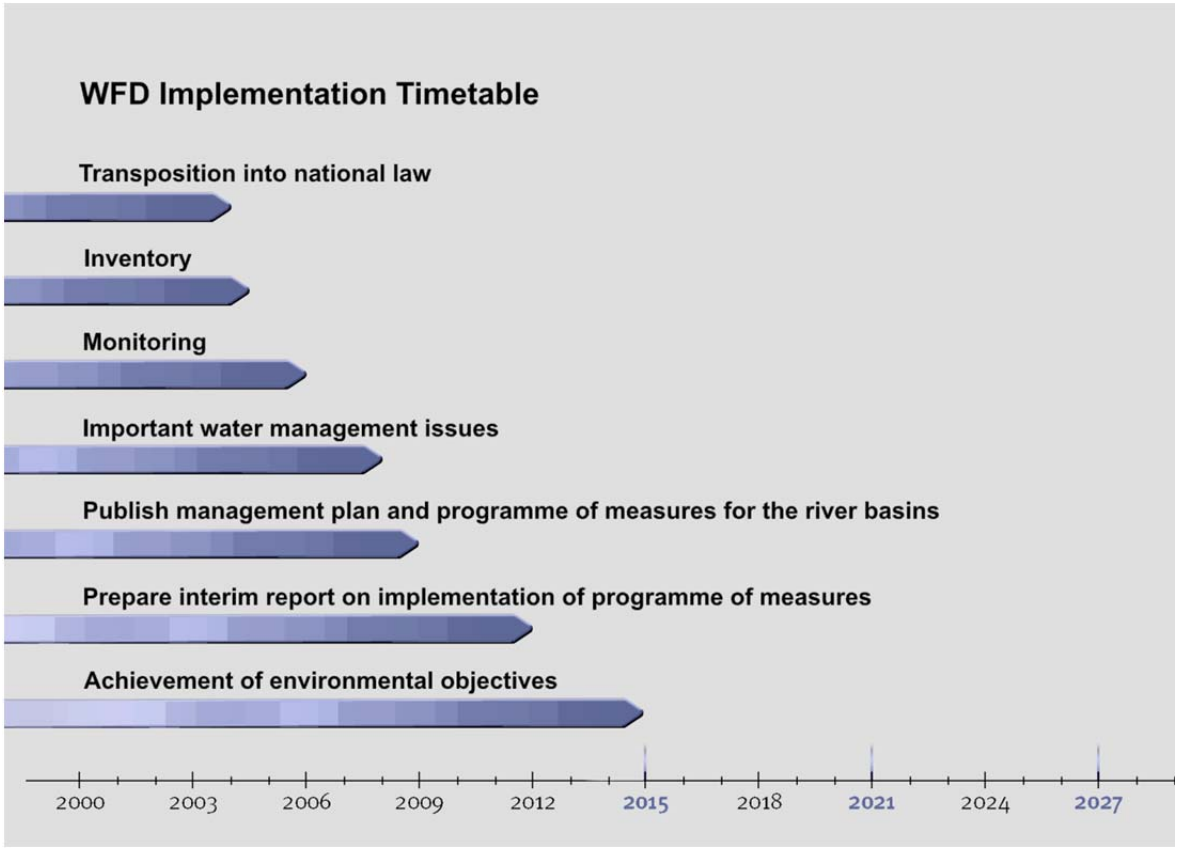


Fig. 1: Timetable for implementation of the WFD

Lower Saxony includes parts of the river basins of the Elbe, Weser, Ems and Rhine. The following management plans are being updated for the four river basins:

[1] See also: Recommendations for coordinated use of MSFD and WFD. LAWA work programme on river basin management, product data sheet 2.7.6 (LAWA 2104a). http://www.wasserblick.net/servlet/is/142651/?lang=de

Table 1: Overview of the inquiry documents at national and international level for the four river basins of the Elbe, Weser, Ems and Rhine

Elbe river basin	Weser river basin	Ems river basin	Rhine river basin
International management plan for the Elbe river basin	-	International management plan for the Ems river basin	International management plan for the Rhine river basin
Management plan for the German part of the Elbe river basin	Management plan for the Weser river basin and detailed management plan relating to salt levels in the Weser river basin	-	Chapeau section on the Rhine river basin

The inquiry documents were exhibited to the public for six months from 22.12.2014 at the branch offices of the NLWKN and made available on the websites of the national and international river basin associations (cf. Chapter 9.1 Table 68). The inquiry documents for the Weser river basin were exhibited from 15.04.2015 to 15.10.2015.

The Lower Saxony contributions to the management plans for the Elbe, Weser, Ems and RhIne river basins were compiled in 2009. For the update of the management plans for the second management period from 2015 to 2021, the contributions will be summarised in a Lower Saxony state report. The preparation of the Lower Saxony state report is based on Section 118 of the Lower Saxony Water Act (NWG). In addition to the Lower Saxony contribution to the management plans for the river basins, a Lower Saxony contribution to the programmes of measures for the river basins was prepared in accordance with Section 117 of the Lower Saxony Water Act (NWG) and Article 11 of the WFD.

Implementation, competencies and coordination

The Lower Saxony contribution to the management plans for the four river basins that lie partly in Lower Saxony summarises the results of the inventory data update, the ecological, chemical and quantitative assessment of the water bodies and the management objectives for Lower Saxony. This basic information has been incorporated in the national and international management plans for the Elbe, Weser, Ems and Rhine river basins.

European Commission recommendations on updating the management plans

The European Commission made a close examination of the management plans in its possession and initiated a dialogue with the member states to clarify unresolved issues. All actors involved in the process of the first management plan cycle are aware that the preparation of the management plan 2009 was a learning process, and both the European Commission and Germany lost no time in starting to develop conclusions and potential improvements for updating the management plans. In addition to various technical matters, the European Commission focused its attention on the question of a uniform coordinated approach in Germany. This discussion included addressing the following points:

- There is a need for further improvements in coordination of cooperation between the federal states and the river basins. The documents must clearly state the basis for addressing the individual work steps.
- The designation of heavily modified water bodies and the development of a procedure for assessing ecological potential are to be coordinated between the federal states.
- The question of whether there is a need for further harmonisation of priority substance monitoring between the federal states must be examined. The Directive amending environmental quality standards (2008/105/EC) is to be implemented on a coordinated basis.
- Since deadline extensions have been claimed for a very large number of water bodies, progress with implementing the measures must be described when updating the plan. The documents must show that despite the large number of deadline extensions, great efforts have been made to implement the measures. Where deadline extensions or divergent management objectives are necessary, more differentiated reasons for this are to be given in the second management plan.
- In the discussion about the degree of detail expected by the European Commission for the measures notified, agreement was reached on a fresh exchange of information about the scale of the information to be provided for the second management plan cycle. The European Commission had expected a detailed description of the individual measures implemented up to the point where good status was achieved and the time scale of their implementation, and also, where necessary, conclusions about and reasons for the relevant extensions of deadlines and divergent management objectives.
- In view of the large number of water bodies with diffuse inputs, the European Commission feels there is a lack of more differentiated information on basic measures (transposition of the Nitrates Directive (91/676/EEC)) and supplementary measures relating to nutrient reduction. In particular, the Commission examined how coordinated transposition of the Nitrates Directive and the WFD took place to ensure that the water bodies achieved the objectives.

Many of these discussion points had already been identified by the federal states at an early stage. On the basis of the preliminary work and the results of the harmonisation workshop in Berlin in October 2010, LAWA worked out the practical need for harmonisation between LAWA and the river basin associations for the national transposition of the WFD, the FRMD and the MSFD. In 2011 the federal states (Länder) initiated a joint work programme that was adopted by LAWA. This LAWA work programme envisages creating working aids and/or drawing up recommendations for a coordinated approach[2]. The results of this harmonisation process include the “action recommendations for harmonising the identification of good

[2] The LAWA working materials for implementing the WFD are available under the following link: http://www.wasserblick.net/servlet/is/142651/

ecological potential (GEP)" or the "action recommendations for justifying deadline extensions with unreasonable cost" (cf. Chapter 11).

Procedure for drawing up the Lower Saxony contribution to the management plans

As a result of the WFD requirement to repeat the various working steps every six years, the steps in updating the management plan are as follows: review all data, revisit all classifications made in 2009, take account of new developments in the assessment of water bodies, and develop strategies and measures based on the latest assessment findings in order to achieve the objectives of the WFD. The work on drawing up the management plans for the second management period was characterised by the improved coordination between the river basins and the relevant federal states, which had been addressed by the European Commission after reviewing the 2009 management plans and subsequently implemented by means of various LAWA action recommendations.
An important part of this was to update the data from the first inventory and their extension for the 2009 management plan. The review and update of the inventory, which was to be completed by 22 December 2013 pursuant to article 5 WFD and Sections 3, 4(1) and 12 of the Ordinance for the protection of surface waters and Sections 2 and 3 of the Ordinance on the protection of groundwater, is being undertaken on the basis of the LAWA working aids (cf. Chapter 2).
The review and update of the inventory for the water bodies is based on four main steps:

- inspection and description of the water bodies,
- identification of pressures,
- assessment of impacts, and
- provisional assessment of achievement of objectives by 2021.

Owing to the passing of the Directive on environmental quality standards (2008/105/EC), the determination of emissions, discharges and losses of priority substances and certain other substances is also to be included in the Lower Saxony contribution to the management plans for the Elbe, Weser, Ems and Rhine river basins. In 2018 a new inventory is to be performed of the discharges, emissions and losses of priority substances.

Content and structure of the Lower Saxony contribution to the management plans

The content and structure follow from Annex VII to the WFD. In addition to the basic information they include the updated inventory data, the status assessment findings, the objectives, the deadline extensions, the divergent management objectives, the economic analysis of water use, and the summary of the programme of measures. The report is structured in accordance with the LAWA instructions. **Part 2 of the present report is new.**

This part of the report summarises the changes and updates compared with the 2009 management plan.

The Lower Saxony contribution to the management plans describes the inventory and assessment findings for those water bodies for which Lower Saxony is responsible. Responsible means that Lower Saxony has responsibility for compiling the data relevant to these water bodies and passing them on to the river basin associations and/or the European Commission.

Responsibility for transboundary water bodies depends on which federal state has the larger share of the water body. Information on water bodies that are only partly situated in Lower Saxony and for which the neighbouring states are responsible can be found in Appendix A-4 for surface waters and Appendix B-3 for groundwater.

1 General description of the characteristics of the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins

1.1 General characteristics of the river basins

Lower Saxony includes parts of the four river basins of the Elbe, Weser, Ems and Rhine. The following table provides an overview of their breakdown.

Table 2: Overview of the Lower Saxony parts of the four river basin districts (figures rounded)

	Size of catchment area (including 12-mile zone)	**Lower Saxony section of catchment area** (including 12-mile zone)	**Lower Saxony section of catchment area** (including 12-mile zone)	**Percentage of area of Lower Saxony** (including 12-mile zone)
Elbe river basin	151,200 km²	9,600 km²	6%	18%
Weser river basin	49,000 km²	29,470 km²	60%	55%
Ems river basin	20,250 km²	13,200 km²	65%	25%
Rhine river basin	188,200 km²	1,050 km²	0.5%	2%

1.1.1 Coordination spaces

For the purpose of management planning, the water bodies[3] – as an essential basis for considering waters within the meaning of the WFD – are grouped in planning units (cf. Fig. 2). In Lower Saxony these largely correspond to the working areas (cf. Tables 3-6). For the purpose of coordinating management planning between the federal states and reporting to the European Commission, multiple planning units are grouped in coordination spaces.

[3] Definition of “water body”: a “body of surface water” means a discrete and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional water or a stretch of coastal water. a “body of groundwater” means a distinct volume of groundwater within an aquifer or aquifers (Article 2 (1), No.10 and 12 WFD).



Fig. 2: Coordination spaces and planning units in Lower Saxony

Coordination spaces for the Elbe

The size of the total catchment area of the Elbe including the 12-mile zone amounts to approximately 151,200 km². The German share comes to 65%, the Czech share 34%, and the shares due to Austria and Poland account for less than 1%. The Lower Saxony share comes to 6%. On the basis of the size of its catchment area, the Elbe is the fourth-largest river in central and western Europe. Lower Saxony accounts for 229.7 km of the total length of the Elbe: 43.5 km entirely within Lower Saxony, and 186.2 km jointly with Brandenburg, Mecklenburg-West Pomerania, Hamburg and Schleswig-Holstein.

The Elbe river basin unit is divided into 10 coordination spaces. Lower Saxony has area-based shares of the coordination spaces: Tidal Elbe, Middle Elbe/Elde and Saale. As far as the centre line of the river, the Elbe itself belongs to the Lower Saxony shares of the

coordination spaces Tidal Elbe and Middle Elbe/Elde and is considered on an interstate basis.
Various planning units cut across state boundaries and lie partly in Lower Saxony, Schleswig-Holstein and Mecklenburg-West Pomerania, like the planning unit Sude, or in Lower Saxony and Saxony Anhalt, like the planning unit Großer Graben.

Table 3: Overview of coordination spaces, working areas and planning units in the Lower Saxony part of the Elbe river basin unit

Coordination space	Area in km²	Lower Saxony share in km²	Working area	No.	Planning unit
Tideelbe (TEL)	15,921	7,181	Tideelbestrom	33	Tideelbestrom
					Tideelbestrom bis 12 Seemeilen
			Hadeln	31	Hadeln
			Oste	30	Oste
			Lühe/Aue-Schwinge	29	Lühe/Aue-Schwinge
			Moorburger Landscheide	52	Ilmenau-Seeve-Este
			Seevekanal	51	
			Este, Seeve, Ilmenau	28	
Mittelelbe / Elde (MEL)	16,551	1,605	Milde-Biese-Aland	43	Milde-Biese-Aland
			Stepenitz-Karthane-Löcknitz	40	Stepenitz-Karthane-Röcknitz
			Sude	39	Sude
			Mulde	35	Ohre
			Elbe Geesthacht bis Havel	34	Elbe von Havel bis Geesthacht
			Jeetzel	27	Jeetze-Seege
Saale (SAL)	24,068	418	Unstrut	38	Helme
			Bode und Rappode	37	Bode
			Großer Graben	36	Großer Graben

Coordination spaces of the Weser

All in all, the Weser river basin covers an area of approximately 49,000 km². It is situated entirely within the Federal Republic of Germany, specifically in the central region of northern and central Germany. The Lower Saxony catchment area of the Weser River basin unit comes to roughly 29,470 km².
The Weser River basin unit is divided into six coordination spaces. Responsibility for the Fulda/Diemel coordination space rests with the state of Hessen, and for the Werra coordination space with the state of Thuringia. With the four coordination spaces Leine, Aller, Weser and Tidal Weser, Lower Saxony plays a major part in implementing the management objectives.
The coordination spaces in Lower Saxony are subdivided into working areas. Various planning units cut across state boundaries. They are shared between Lower Saxony and North Rhine-Westphalia (e.g. the planning unit Weser/Emmer), Saxony-Anhalt and Thuringia.

Table 4: Overview of coordination spaces, working areas and planning units in the Lower Saxony part of the Weser river basin unit

Coordination space	Area in km²	Lower Saxony share in km²	Working area	No.	Planning unit
Werra (WER)	5,496	59	Werra	41	Werra
Fulda/Diemel (FUL)	8,707	98	Fulda	42	Fulda
Weser (WES)	8,414	4,504	Weser/Nethe	8	Weser/Nethe
			Weser/Emmer	10	Weser/Emmer
			Werre	11	Werre
			Weser/Meerbach	12	Weser/Meerbach
			Große Aue	13	Große Aue
Aller (ALL)	9,204	8,502	Aller/Quelle	14	Aller/Quelle
			Oker	15	Oker
			Fuhse/Wietze	16	Fuhse/Wietze
			Aller/Örtze	17	Aller/Örtze
			Aller/Böhme	22	Aller/Böhme
Leine (LEI)	6,518	6,054	Leine/Ilme	18	Leine/Ilme
			Rhume	19	Rhume
			Innerste	20	Innerste
			Leine/Westaue	21	Leine/Westaue
Tide-Weser (TWE)	10,716	10,254	Weser/Ochtum	23	Weser/Ochtum
			Wümme	24	Wümme
			Hunte	25	Hunte
			Unterweser	26	Unterweser
			Weser bis 12 Seemeilen	841	Weser bis 12 Seemeilen

Coordination spaces of the Ems

The Ems River basin unit covers a total area of approximately 18,000 km² including the one-mile zone. About 15,000 km² of this area lies on German territory and roughly 2,312 km² on Dutch territory. The remaining 482 km² are part of the international Ems-Dollart working area. Of the area within Germany, 4,134 km² is due to North Rhine-Westphalia and 10,874 km² to Lower Saxony. The Lower Saxony parts of the Ems river basin unit are located in the coordination spaces Ems Nord and Ems Süd. The Ems River basin unit is divided into seven working areas. The “Nedereems” working area is situated entirely in Dutch territory. The “Ems-Dollart” working area is dealt with on an international basis by subcomittee “G” (Ems-Dollart) of the permanent German-Dutch Boundary Waters Commission. The Ems river basin unit on German territory comprises the five working areas Obere Ems, Hase, Ems/Nordradde, Leda-Jümme and Untere Ems. The planning units Obere Ems and Hase are transboundary units situated partly in Lower Saxony and partly in North Rhine-Westphalia.

Table 5: Overview of coordination spaces, working areas and planning units in the Lower Saxony part of the Ems river basin unit

Coordination space	Area in km²	Lower Saxony share in km²	Working area	No.	Planning unit
Ems Süd (EMS)	9,413	5,279	Obere Ems	01	Obere Ems
			Hase	02	Hase
			Ems-Nordradde	03	Ems-Nordradde
Ems Nord (EMN)	8,513 (with Ems-Dollart)	8,513 (with Ems-Dollart)	Leda-Jümme	04	Leda-Jümme
			Untere Ems	06	Untere Ems
			Untere Ems	832	Untere Ems bis 12 Seemeilen
			Ems-Dollart	07	Ems-Dollart
			Ems-Dollart	831	Ems-Dollart bis 12 Seemeilen

Rhine coordination space

The size of the total catchment area of the Rhine amounts to approximately 188,200 km². With 106,000 km², Germany is the country with the largest share of the river basin unit. The Lower Saxony share of the Rhine river basin unit – the Vechte working area – lies in the coordination space “Deltarhein” and accounts for only 1,053 km². The Vechte working area in Lower Saxony is part of the international working area “Deltarhein-Ost”.

Table 6: Overview of coordination spaces, working areas and planning units in the Lower Saxony part of the Rhine river basin unit

Coordination space	Area in km²	Lower Saxony share in km²	Working area	No.	Planning unit
Deltarhein (DRH)	34,200	1,053	Vechte	32	Vechte

1.1.2 Hydrology and discharge control

Hydrology and discharge control in the Elbe river basin unit

The Tidal Elbe extends from the weir at Geesthacht (Elbe-km 585.9) to the point where the river flows into the North Sea at Cuxhaven-Kugelbake (Elbe-km 727.7). The coordination space Tidal Elbe also includes the associated coastal waters of the North Sea. The area of coastal waters totals 2,555 km². The coordination space Mittlere Elbe/Elde takes in the Elbe from the point where the Saale flows into the Elbe as far as the weir at Geesthacht, a length of 365 km. The main tributaries flowing into the Tidal Elbe from the Lower Saxony side are the Ilmenau, Luhe, Seeve/Seevekanal, Este, Lühe, Schwinge, Oste, Hadelner Kanal and Medem. In the case of Mittlere Elbe/Elde they are the Jeetzel and the Sude.
The basic hydrological data for the Lower Saxony part of the Elbe river basin unit are shown in Table 7 (HPA 2013).

Table 7: Basic hydrological data for the Elbe river basin unit

Flowing waters	Gauge	Catchment area size AEo (km²)	Flow rate MQ [m³/s]	Specific discharge Mq l/[s*km²]
Ilmenau	Bienenbüttel	1,434	9.14	6.37
Seeve	Jehrden	408	4.44	10.90
Este	Emmen	184	1.77	9.62
Oste	Rockstedt	611	6.35	10.40
Hadelner Kanal	Hadelner Kanalschleuse	292	3.01	10.30
Jeetzel	Lüchow	1,300	6.18	4.75
Sude	Garlitz	735	4.56	6.20

Hydrology and discharge control in the Weser river basin unit

The Werra and Fulda are the source rivers of the Weser. The Weser itself begins at the confluence of Werra and Fulda in Hannoversch Münden and has a length of 422 km until it flows into the North Sea at Bremerhaven. The basic hydrological data for the Lower Saxony part of the Weser river basin unit are shown in Table 8 (NLWKN 2013a).

Table 8: Basic hydrological data for the Weser river basin unit

Flowing waters	Gauge	Catchment area size AEo (km²)	Discharge MQ in m³/s	Origin
Leine	Schwarmstedt	6,517	61.6 m³/s	Eichsfeld
Aller	Rethem	9,204	115 m³/s	Magdeburger Börde
Weser	Intschede	8,412	317 m³/s	Durch Zusam-menfluss von Werra und Fulda bis Bremen
Tideweser	-	8,924	No MQ due to tidal influence	Ab Bremen
Jade	-	1,740	No MQ due to tidal influence	Due to confluence of Schanze and Rasteder Bäke

Hydrology and discharge control in the Ems river basin unit

To the northeast of Rheine the Ems crosses the boundary between North Rhine-Westphalia and Lower Saxony. Important tributaries of the Ems in Lower Saxony with catchment areas of more than 100 km² are: Große Aa, Hase, Nordradde and Leda. Important canals are the Mittelland Canal, the Coastal Canal (Küstenkanal) and the Ems-Jade Canal. The basic hydrological data for the catchment area are shown in Table 9 (NLWKN 2013a).

Table 9: Basic hydrological data for the Ems river basin unit

Flowing waters	Gauge	Catchment area size AEo (km²)	Discharge MQ [m³/s]	Specific discharge Mq l/[s km²]
Speller Aa	Hesselte	370	3.35	9.05
Hase	Bokeloh	2,975	28.7	9.65
Nordradde	Apeldorn	127	1.09	8.58
Leda	Leer	2,078	22.8	10.9
Ems	Versen	8,389	79.6	9.49

Hydrology and discharge control in the Rhine river basin unit

The Vechte is a medium-sized lowland river. Its catchment area belongs to the coastal area of the Rhine. Its source is in North Rhine-Westphalia, to the south of the town of Horstmar, and it flows into the Zwarte Water, an arm of the Ijssel, near Zwolle in the Netherlands. It has a total length of 167 km, of which 72 km are in Lower Saxony. The Lower Saxony part of the Vechte begins at Vechte-km 132.3 (crossing the state boundary from North Rhine Westphalia to Lower Saxony close to Ohne) and ends at Vechte-km 60.0 km (where it passes from Lower Saxony into the Netherlands close to Laar). The basic hydrological data are shown in Table 10.

Table 10: Basic hydrological data for the Rhine river basin unit[4]

Flowing waters	Gauge	Catchment area size AEo (km²)	Discharge MQ [m³/s]	Specific discharge Mq l/[s km²]
Vechte	Emlichheim	1,731	17.9	10.3
Dinkel	Lage/Total	611	6.66	10.9

1.1.3 Physiographic areas

Lower Saxony is divided into nine major physiographic regions. The largest areas are accounted for by the physiographic areas “Ems-Hunte Geest and Dümmer Geest lowlands” in the south-west and “Lüneburg Heath and Wendland” in the south-east of the state. The “Weser-Aller lowlands” adjoin these to the south, to about the level of Bremen. Southern Lower Saxony is dominated by the physiographic area “Weser and Weser-Leine hill country”, but also includes parts of the physiographic areas “Börden” and “Harz”. The northern region is made up of the physiographic areas “Stader Geest” and “Lower Saxony North Sea coast and marshes”, plus “East Frisian and Oldenburg Geest” in the north-west.

1.1.4 Climate

Lower Saxony is a state with a wide variety of climatic regions[5]. Along the coastline the influence of sea and wind is dominant. Towards the East and in the interior of the state, the

[4] Communication from Meppen Branch

climate becomes increasingly continental. There is a marked decrease in precipitation as one moves from West (mean annual precipitation mostly between 700 and 800)[6] to East (below 600 mm). This reflects the decreasing maritime influence. In the Harz Mountains, mean annual precipitation may locally exceed 1,500 mm. At 736 mm per square metre, long-term mean annual precipitation in Lower Saxony is 43 mm less than the figure for Germany as a whole.
During the period from about 1950 to 2000, the mean annual temperature in Lower Saxony was 8.7°C, or 0.4°C higher than the mean for Germany as a whole. Owing to the influence of maritime air masses, the air temperature in the lowlands of Lower Saxony is relatively uniform, whereas considerable differences due to altitude occur in the Harz and the other central uplands.

1.1.5 Settlement, transport and land use

Nearly 7.8 million people live in Lower Saxony[7], large areas of which have a predominantly rural character and a relatively low population density. The state's major centres are the cities of Hanover, Braunschweig, Osnabrück, Oldenburg and Göttingen and − concentrated in the southern part of Lower Saxony − Wolfsburg, Salzgitter and Hildesheim.
The motorways A1 and A7, and also the waterways Ems, Weser, Elbe and Elbe-Seitenkanal, provide access to the state from north to south, starting from the ports at the coast or on the river estuaries. Wilhelmshaven is Germany's only deep-water port. The A2 and the Mittelland Canal link Eastern and Western Lower Saxony. The main transport hub is the Hanover region, which also has an efficient international airport.

Land use throughout the state is dominated by arable farming (46.7%) and pasture (15.3%). The main focus of arable land use is in the West, in the Weser-Ems region. Use of pasture is largely found in northern Lower Saxony. Large areas of forest exist in the Weser-Leine hill country and the Harz, and also in the East. In addition to lakes and major rivers within the state, Lower Saxony's North Sea coast accounts for the greater part of its water areas. In northern Lower Saxony there is also a sizeable area with special crops, namely the fruit-growing region of the Altes Land. The remaining area of the state is classified as belonging to the uses: settlement, wetlands and vegetation. The information on land use can provide pointers to possible pressures or sources of pollution. The land-use information in Fig. 3 is based on the data in CORINE Land Cover 2006.

[5] http://www.umwelt.niedersachsen.de/umweltbericht/klima/. Accessed on 23.07.2014
[6] http://nibis.lbeg.de/cardomap3/, aktuelle Klimareferenzperiode (1961-1990). Accessed on 23.07.2014
[7] http://www.statistik.niedersachsen.de/portal/live.php?navigation_id=25688&article_id=87679&_ psmand=40 and http://www.statistik.niedersachsen.de/portal/live.php?navigation_ id=33724&article_id=91480&_psmand=40. Accessed on 22.07.2014

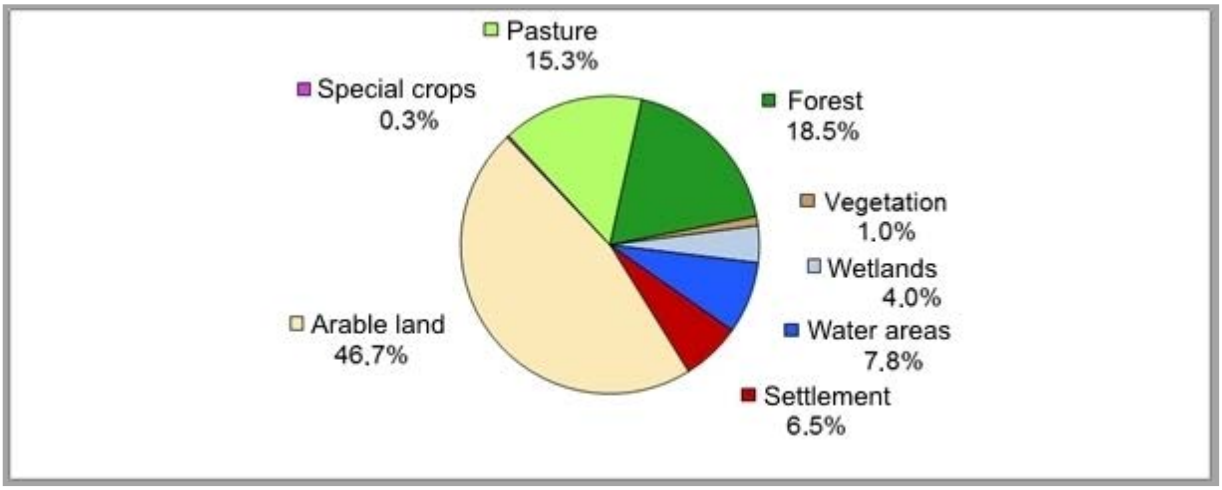


Fig. 3: Land use in Lower Saxony (figures in percent)

1.2 Surface waters

1.2.1 WFD eco-regions

From a topographical and geological point of view, Lower Saxony largely belongs to eco-region[8] 14 “Central Plains”. Only the offshoots of the Teutoburger Wald and the Wiehengebirge in the south-west and small parts of the southern tip of Lower Saxony belong to eco-region 9, “Central Highlands”. The coastal regions belong to eco-region 4 “North Sea”.

1.2.2 Classification of surface waters and determination of reference conditions for surface water bodies

One of the surface water objectives mentioned in Section 27 of the Federal Water Act and Article 4 of the WFD is good ecological status or good ecological potential. The definition of such a status depends on the existence of a corresponding assessment system which, with the introduction of the WFD, has a strong focus on the biocenosis of a water body and particularly on its biological quality elements (fish, macrophytes and phytobenthos, phytoplankton and benthic invertebrate fauna). Creating a water body typology that reflects the various biological colonisation patterns (= biocenotic types) was therefore an important foundation for the assessment process. In particular, the ecological approach to assessment takes advantage of the fact that as a result of their interactions with abiotic conditions, the water body’s communities integrate the sum of all influences, in other words they can be used as indicators.

Water body classification provides the basis for a system for assessment and management of the water bodies under the WFD that is geared to physiographic conditions. In Germany, classification is performed in accordance with System B of Annex II to the WFD. First of all, the following categories are distinguished: “flowing waters with a catchment area in excess of

[8] The eco-regions can be seen in Maps A and B of Annex XI to the WFD.

10 km²", "standing waters with a surface area in excess of 50 ha", "transitional waters" and "coastal waters within a distance of one nautical mile on the seaward side from the baseline". On this basis the relevant water bodies are further subdivided in terms of geological, morphological and hydrological characteristics. The water body types were characterised in terms of abiotic and biotic "profiles". A total of 25 flowing water types (or 33 with subtypes), 14 lake types, 2 transitional water types, 5 coastal water types for the North Sea and 4 coastal water types for the Baltic Sea[9] were defined for Germany.
Lower Saxony is dominated by sand and gravel dominated lowland streams, followed by sand and loam dominated lowland rivers and the small and medium flowing waters of the marsh country (cf. Fig. 4).

[9] http://www.wasserblick.net/servlet/is/142684/?lang=de, RaKon B-Arbeitspapier I (LAWA 2013a). Accessed on 22.07.2014

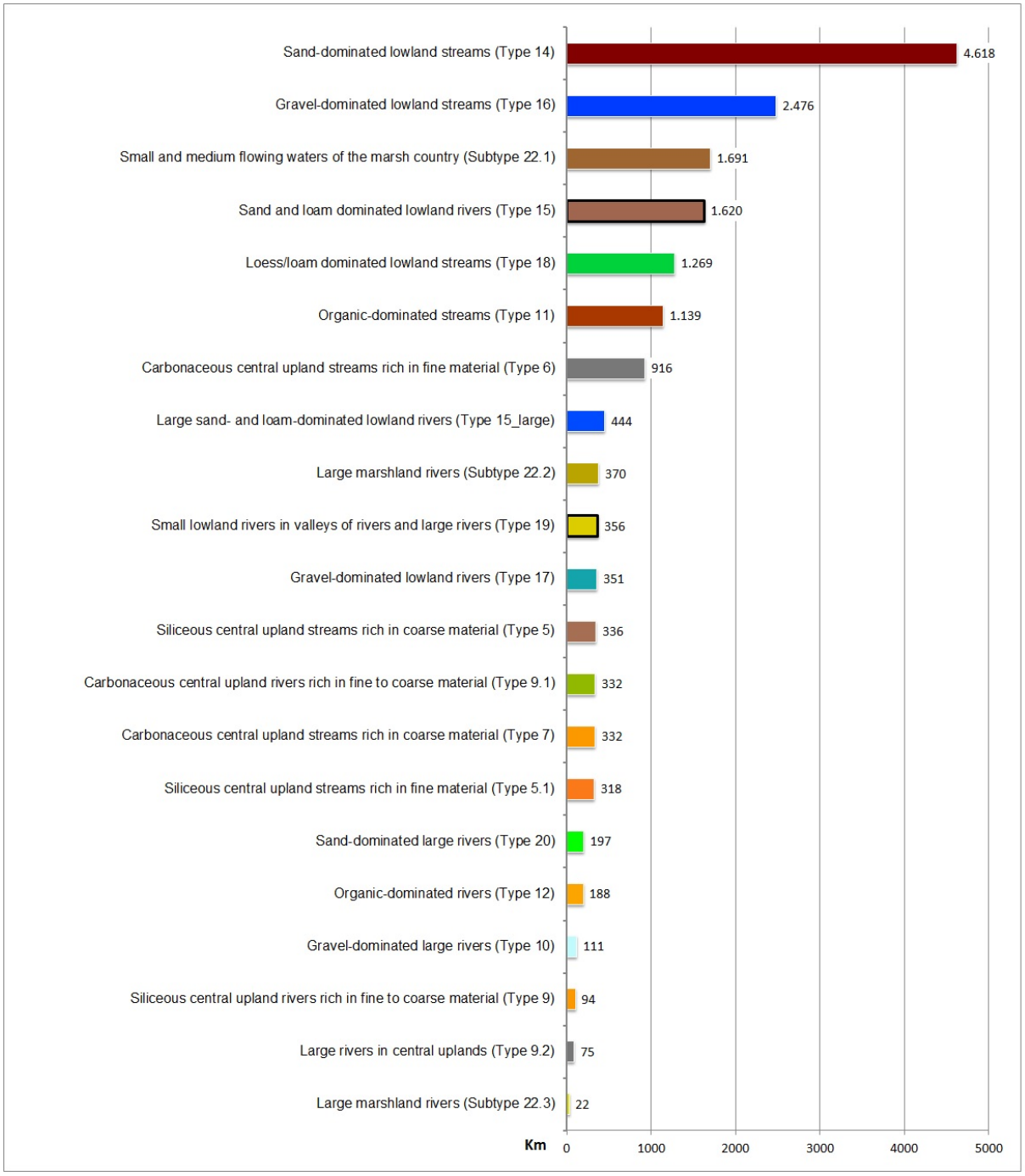


Fig. 4: Flowing water types in Lower Saxony

The water body types reflect the diversity of physiographic areas in Lower Saxony. Coastal areas of Lower Saxony are characterised by marshland streams and organic dominated water bodies. Further into the interior of the state the Stader Geest and the Lüneburg Heath are characterised by gravel dominated lowland rivers and streams. Sand-dominated lowland streams and sand and loam dominated lowland rivers are typical of the Geest areas in the West and of the Weser-Aller lowlands. The water bodies of the Börden areas are largely dominated by loess and loam. In southern Lower Saxony the water bodies of the Weser-Leine hill country are largely siliceous and carbonaceous, and in the Harz mountains they are almost entirely siliceous.
The lakes of the central upland areas include the reservoirs of the Western Harz and the Seeburger See. Otherwise the state is dominated by lowland lakes. Canals, which in Lower Saxony account for a total length of about 480 km, are not assigned to any water body type.

Table 11: Types of standing watersin Lower Saxony

Standing waters			**Area in km²**
Central uplands	Type 6	Polymictic, calcium-rich central upland lake	0.8
	Type 8	Stratified, calcium-rich central upland lake with relatively large catchment area	7.8
	Type 9	Stratified, calcium-rich central upland lake with relatively small catchment area	0.3
Central plains	Type 10	Stratified lowland lake with relatively large catchment area	1.3
	Type 11	Polymictic lowland lake with relatively large catchment area	60.2
	Type 12	Lowland river lake	0.6
	Type 13	Stratified lowland lake with relatively small catchment area	2.2
	Type 14	Polymictic lowland lake with relatively small catchment area	0.8
Special type	Type 88	Moorland lake	0.9

The transitional and coastal waters of Lower Saxony extend from the Ems region at the Dutch-German border in the West to the region of the Tidal Elbe in the East. The region ranging seawards from the coastal waters as far as the territorial boundary (12-mile zone) is referred to as the Coastal Sea. The area covered by the WFD includes the one-mile zone (coastal waters), and with regard to the assessment of chemical status it also takes in the 12-mile zone (Coastal Sea). The total area to be assessed for chemical status amounts to approximately 5,500 km², while the area to be assessed for ecological purposes – excluding the coastal sea – comes to roughly 3,300 km². On the basis of their average salt concentration and their average depth and other criteria, the transitional and coastal waters in Lower Saxony are assigned to the following types of water bodies (cf. Table 12).

Table 12: Types of transitional and coastal waters in Lower Saxony

Type	Title
Transitional waters (estuaries with a catchment area of 10 km² or more)	
Type T1	Transitional waters, Elbe-Weser-Ems
Coastal waters of the North Sea	
Type N1	Euhaline open coastal waters
Type N2	Euhaline Wadden Sea
Type N3	Polyhaline open coastal waters
Type N4	Polyhaline Wadden Sea

1.2.3 Surface waters

The basis of the surface water types in conjunction with other criteria such as catchment area, water quality and structure, discrete and significant sections of a surface water body that define an ecologically functioning space and a unit suitable for practical management, are defined as water bodies (Article 2 (10) of the WFD, cf. CIS[10] Guidance Document No. 2 (EU Commission 2004a)). Table 13 shows the number of water bodies for which Lower Saxony is currently responsible and which were reviewed and adjusted as part of the inventory. Various water bodies cross state boundaries, so parts of them belong to other federal states.

Table 13: Number of surface water bodies for which Lower Saxony is responsible

Water body categories	Number of water bodies
Flowing waters	1,562
Standing waters	27
Transitional waters	3
Coastal waters	13
Total surface waters	**1,605**

1.3 Groundwater

A body of groundwater means a discrete volume of groundwater within an aquifer or aquifers (Article 2 (12) WFD). Like surface water bodies, groundwater bodies form the smallest management unit in the groundwater sector.
Lower Saxony is responsible for 90 bodies of groundwater. Various bodies of groundwater cut across state boundaries and thus have parts in different states.
The boundaries of groundwater bodies are defined in terms of hydraulic conditions and are based on surface watersheds and receiving waters. For this purpose it is assumed that the watersheds of the surface waters are also a large-scale reflection of subsurface watersheds. However, local divergences are possible as a result of hydrogeological conditions. The boundaries of water bodies are not defined in the vertical plane, because no meaningful

[10] CIS stands for Common Implementation Strategy. The papers produced under the European Commission's common implementation strategy are intended to provide assistance with uniform implementation.

subdivision is possible for this purpose in view of the sometimes complex geological structure.
Since Lower Saxony's groundwater bodies, especially in the unconsolidated regions of the North German plain, are very large and heterogeneous from a hydrogeological point of view, the groundwater bodies have been further subdivided into sub-units possessing similar or comparable hydrogeological, hydrodynamic, hydrochemical and pedological properties.

1.4 Protected areas

The protected areas of relevance to the WFD comprise those areas which have been designated as requiring special protection under specific Community legislation for the protection of their surface water and groundwater or for the conservation of habitats and species directly depending on water.
According to Article 6 (1) of the WFD and Annex IV No. 1 to the WFD, the lists of protected areas in the river basins include:

- areas designated for the abstraction of water intended for human consumption,
- areas designated for the protection of economically significant aquatic species,
- recreational water bodies (bathing waters),
- sensitive and nutrient-sensitive areas,
- water-dependent Habitats Directive and Birds Directive areas,

and are to be regularly reviewed and updated (Art. 6 (3) WFD).

The lists of protected areas have been updated. Information on the status of the protected areas can be found in Chapter 4.4. The environmental objectives pursuant to Article 4 (1c) WFD are considered in Chapter 5.4. The EC directives were implemented by means of the federal and state provisions underlying the designation of the protected areas. These count as basic measures. These statutory provisions in Germany and Lower Saxony are listed in the Lower Saxony contribution to the programmes of measures for the Elbe, Weser, Ems and Rhine river basins.

1.4.1 Areas designated for the abstraction of water intended for human consumption

The list of protected areas identifies all water bodies which are used for the abstraction of water intended for human consumption and which supply an average of more than 10 m^3 per day or serve more than 50 persons, or which are intended for such use (Section 119 NWG, Annex IV (1i) and Article 7 (1) WFD). These areas thus enjoy special protection under the WFD.

Table 14: Number of water bodies for drinking water abstraction pursuant to Section 119 NWG, Article 7 (1) WFD

Protected area	Number
Groundwater bodies for drinking water abstraction pursuant to Section 119 NWG	89
Surface water bodies for drinking water abstraction pursuant to Section 119 NWG	9

1.4.2 Areas designated for the protection of economically significant species

The Fish Water Directive (78/659/EEC) and the Shellfish Water Directive (79/923/EEC) ceased to apply on 22.12.2013. Fish waters and shellfish waters are therefore no longer included in the Lower Saxony contribution to the management plans.
The lists of areas designated for the protection of economically significant species in the first management plan included 46 fish water bodies pursuant to Directive 78/659/EEC and seven shellfish water bodies pursuant to Directive 79/923/EEC.

1.4.3 Recreational water bodies (bathing waters)

Bathing waters designated by the health authorities of the federal states under the Bathing Waters Directive (76/160/EEC) or the revised version of this Directive (2006/7/EC) and the transposition of these directives into legal provisions of the federal states (bathing waters ordinances) are regarded as recreational water bodies pursuant to Annex IV I iii of the WFD. No other recreational water bodies have been designated in Lower Saxony.

Table 15: Number of recreational water bodies (bathing waters)

Protected area	Number
Recreational water bodies (bathing waters)	277

1.4.4 Nutrient-sensitive areas (under Nitrates Directive and Urban Wastewater Directive)

Action programmes are carried out on the entire agricultural area of Germany to protect water bodies from contamination by nitrate from agricultural sources in accordance with the Nitrates Directive (91/676/EEC). As a result, no use is made within Germany of the opportunity to designate endangered areas. The Nitrates Directive is transposed at national level by means of the Fertilisers Ordinance and, to some extent in the federal states, by means of regulations in facility-related ordinances and the state water acts.
The areas classified as sensitive under the Urban Wastewater Directive (91/271/EEC) are spread over the whole of Lower Saxony. The directive is transposed by means of the Federal Wastewater Ordinance and in the federal states by means of the municipal wastewater ordinances, in some cases supplemented by provisions in the state water act or by ordinances on indirect discharges. The nationwide coverage of both the Nitrates Directive

and the Urban Wastewater Directive in Germany results from international conventions on marine protection. Full-coverage measures are intended in particular to contribute to achieving the reduction in marine concentrations agreed under the International North Sea conference.

1.4.5 Water-dependent Habitats Directive and Birds Directive areas

The list of protected areas includes areas pursuant to Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora (Habitats Directive) or areas pursuant to Directive 9/409/EEC on the conservation of wild birds (Birds Directive) where the maintenance or improvement of the status of water is an important factor in their protection (water-dependent Habitats Directive and Birds Directive areas). The legal basis for transposition of the directives consists of the Federal Nature Conservation Act and the Federal Water Act, and also the statutory provisions in Lower Saxony such as the Lower Saxony Nature Conservation Act.
In Lower Saxony, Habitats Directive Areas in which at least one water-dependent habitat type occurs or at least one water-dependent species has a significant population, are classified as water dependent.
In the case of Birds Directive areas, the areas selected were those in which at least one water-dependent bird species played a decisive role in defining their value as European bird sanctuaries or was regularly shown to exist.

Table 16: Number of water-dependent Habitats Directive and Birds Directive areas

Protected area	Number
Water-dependent Habitats Directive areas	331
Water-dependent Birds Directive areas	66

331 of the 385 Habitats Directive areas and 66 of the 72 Birds Directive areas in Lower Saxony are water dependent. This underlines the significance of the WFD for the conservation of biological diversity in Lower Saxony, and indeed in all river basin units. The subject of biodiversity is therefore taken up in the following excursus prepared by LAWA:

Excursus I: Biodiversity/Natura 2000/Invasive species (LAWA, 2014)

Introduction

There has been an increasing focus on “biodiversity”, as the short version of the term “biological diversity”, not least since the entry into force of various EC directives. One reason for this is the worldwide threat to ecosystems, accompanied by loss of biodiversity on an unparalleled scale[11]. Through the irreversible impoverishment of the genetic potential, this loss of biodiversity results in deterioration of the performance, regeneration and functional capacity of the natural regime. Sustainable usability of natural goods is an essential basis for the existence of human life, e.g. through the development of new medicines. The reduction in biological diversity therefore leads to considerable losses for the global economy, causes socio-economic losses[12], has adverse effects on business prospects and on opportunities for combating poverty.
Conservation and sustainable use of biological diversity are therefore seen as an important basis for human well-being. Conversely, the continuing destruction of natural habitats is regarded as by far the greatest danger to biological diversity on earth[13].
It is basically necessary to distinguish various aspects of biodiversity:

- genetic variety
- species diversity
- ecosystem diversity

Protection of biodiversity

Biodiversity is subject to considerable threats in Europe as well. In 2011 the European Commission therefore presented a new strategy (EU Biodiversity Strategy) to protect and improve biological diversity in Europe over the period up to 2020. By this means the EU also complied with its international obligations under the United Nations Convention on Biological Diversity. Having regard to the main reasons for biodiversity loss, such as changes in land use, environmental pollution, resource exploitation and climate change, this set out six priority objectives as the core of the strategy:

- complete implementation of existing nature conservation provisions and the network of Natura 2000 areas to achieve significant improvements in the conservation status of habitats and species;
- preservation, improvement and restoration of ecosystems and ecosystem services

[11] COM (2011) 244 final: Lebensversicherung und Naturkapital: Eine Biodiversitätsstrategie der EU für das Jahr 2020
[12] Costanza, R., d Árge R., de Groot R., Farber S., Grasso M., Hanno B., Limburg K., Naeem S., O´Neill R.V., Paruelo J., Raskin R.G., Sutton P., van den Belt M. (1997): The value of the world’s eco-system services and natural capital. NATURE Vol 387, 253-260
[13] Page on “Biodiversity”. In: Wikipedia, Die freie Enzyklopädie. Bearbeitungsstand: 1. Februar 2014, 15:39 UTC. URL: http://de.wikipedia.org/w/index.php?title=Biodiversit%C3%A4t&oldid=127096711

wherever possible, especially by using green infrastructures;

- ensuring the sustainability of agricultural and silvicultural activities;
- conservation and protection of fish stocks in the EU;
- research into the ecology of neobiota in their (new) habitats and, where appropriate, action to combat invasive species as an increasing cause of biodiversity loss in the EU;
- stepping up the EU contribution to joint activities to avert global loss of biodiversity.

In its National Biodiversity Strategy (NBS), Germany has defined these biodiversity objectives more precisely (e.g. by adopting the objectives of the WFD) and enshrined them in the relevant policy areas. Only in this way is it possible to promote synergies and minimise antagonistic effects. The fields of action in which coherent strategies are necessary for the joint efforts to protect the biodiversity of aquatic ecosystems include inland shipping, flood control, alleviation of flood impacts, agriculture and use of hydro power. The German government prepares regular progress reports on the implementation of the NBS, backed up by indicators.

Water Framework Directive and biodiversity

The objectives of the European Commission's strategy also apply to aquatic ecosystems and groundwater-dependent terrestrial ecosystems. Here the member states are obliged under the Water Framework Directive (WFD, 2000/60/EC) and the Groundwater Directive (GWD, 2006/118/EC) to protect and improve surface waters, such as rivers and lakes, transitional and coastal waters, and groundwater-dependent terrestrial ecosystems. Together with the Habitats Directive (92/43/EEC) and the Birds Directive (79/409/EEC), these directives form the legal framework for the protection and management of freshwater-dependent and water-dependent terrestrial ecosystems. The Habitats Directive and the Birds Directive are intended to implement the objectives by creating a network of protected areas for the conservation of endangered species and habitat types (Natura 2000). In Annex VI to the WFD they are explicitly mentioned among the directives that are to be taken into account as fundamental to the programmes of measures of the WFD. Furthermore, Habitats Directive areas and Birds Directive areas are to be included in operational monitoring.

The principal objective of water body management under the Water Framework Directive and the Groundwater Directive is to achieve good status for all surface waters and the groundwater by the binding statutory deadline of 2027. The objective of good ecological and quantitative status promoted by the WFD thus directly fosters and supports the biodiversity objectives for aquatic ecosystems and groundwater-dependent terrestrial ecosystems. While water meadows as important elements of aquatic ecosystems are hardly mentioned as such in the WFD, under the Habitats Directive they are habitat types to be protected as "water-meadow forests with alder, ash and willow" and "hardwood water meadow forests". Achieving good ecological status also depends on the existence of intact water meadows, because many species within the aquatic community spend an

important part of their life-cycle in the shore and water meadow zone. Water meadows are also taken into account via the inclusion of the water regime. To achieve good groundwater status (Article 4 WFD and Annex V) it is necessary to exclude the possibility of groundwater-dependent terrestrial ecosystems being damaged by non-sustainable use of water.

It can basically be assumed that implementing the Water Framework Directive, the Groundwater Directive, the Habitats Directive and the Birds Directive gives rise to synergies, even if these directives take different approaches. To be in a better position to take advantage of the positive impacts of the directives, there is a need for fine tuning of instruments and programmes of measures. The content and focal areas of the directives mentioned are summarised in the following table:

Directive	WFD	Habitats/Birds Directive
Objectives	Good status (ecological, quantitative and chemical status) No deterioration	Favourable conservation status No deterioration
Level	Catchment area Water body (WB)	Area/biogeographical region Habitat type Type
Instruments	Management plan for catchment area Programmes of measures Normative definition (type, reference, intercalibration)	Network of Habitats Directive and Birds Directive areas Habitats Directive impact assessment Management plans
Timetable	Six-year management cycle with reporting, monitoring and achievement of objectives by 2015 (or not later than 2027 in the case of deadline extensions or divergent management objectives)	Every six years: Habitats Directive report on the implementation of measures and the status of the species and habitat types listed in the annexes to the Habitats Directive (next report by 2019) Report under Birds Directive every six years

Neobiota and invasive species

The European biodiversity strategy also explicitly mentions control of the spread of invasive species as a priority objective. Many neobiota have become established as non-native species and supplement the domestic flora and fauna; invasive species, on the other hand, have adverse impacts on communities and frequently compete with domestic species for habitats and resources. The WFP does not directly address the subject of immigration of neobiota. References to introduced species are however found in the CIS

Guidance Document REFCOND with regard to the significance of introduced species and invasive species for reference waters or parts thereof, and in the CIS Guidance Document IMPACT, in which neobiota are mentioned as a “biological pressure”.
Today, many introduced species are an established part of the biocenoses of rivers and lakes, and it is no longer possible to remove them from these waters with a reasonable input of resources. The creation of richly structured natural and site-typical habitats is the best and most efficient approach to giving domestic species a competitive advantage and preventing the further spread of introduced species.
The national methods for assessing ecological status take account of the occurrence of introduced species in Germany by using metrics to integrate neobiotic species as a component of the biocenosis. This reliably records and evaluates the interactions between introduced species and the original biocenosis – with regard to both positive and negative impacts. In certain types of water bodies, introduced species have a major influence on ecological assessment under the WFD.

2 Pressures and anthropogenic impacts on water body status

2.1 Pressures

Reviewing and updating pressures and anthropogenic impacts is an important step taken in the process of updating the inventory. It is based on the provisions of the Surface Waters Ordinance and the Groundwater Ordinance. The procedure is described in the following LAWA working aids[14]:

- Reviewing and updating the inventory under the Water Framework Directive by the end of 2013 – criteria for determining significant anthropogenic pressures in surface waters, evaluating their impacts and assessing the achievement of the relevant objectives by 2021 (cf. Chapter 11, LAWA 2013b)

and

- LAWA working aid for implementing the Water Framework Directive, Part 3, Chapter II.1.2 – Groundwater – (cf. Chapter 11, LAWA 2013c)

To make it easier to follow the planning process, Lower Saxony is creating stronger links between the working steps in the spirit of the "DPSIR concept" (Driving force – Pressure – State – Impact – Response) (cf. European Commission 2004b and Table 17).

Table 17: Explanation of DPSIR concept

	Term	Definition	Example of applying the DPSIR approach to nutrient pollution in Lower Saxony
D	**Driving force (environmentally relevant activity)**	A human activity which may have an impact on the environment (e.g. agriculture, industry)	Agriculture and other activities
P	**Pressure**	The direct effect of an environmentally relevant human activity (e.g. an effect leading to a change in discharge or a change in water quality)	Pollution due to nutrients in water bodies as a result of agricultural activities (infiltration, erosion, discharge, drainage, changes in management, afforestation, use of fertiliser, livestock density etc.)
S	**State**	The quality of a body of water as a result of both natural and human factors (e.g. physical, chemical and biological properties)	Ecological or chemical status of water bodies not good
I	**Impact**	The impact of a pollution factor on the environment (e.g. fish mortality, changes in ecosystem)	Elevated nutrient concentrations, changed species composition

[14] http://www.wasserblick.net/servlet/is/142651/?lang=de

	Term	Definition	Example of applying the DPSIR approach to nutrient pollution in Lower Saxony
R	**Response**	The measures taken to improve the status of a water body (e.g. restrictions on abstraction, limits on point source inputs, good professional practice in agriculture)	Implementation of measures relating to surface waters to reduce direct nutrient inputs from the agricultural sector or implementation of measures to reduce nutrient inputs into groundwater by leaching from agriculture

LAWA therefore laid down a harmonised approach with the aid of the LAWA working aids, and agreement was also reached on a differentiated description of the pressures in terms of content. To a greater extent than in the first management plan, this differentiated description of pressures explains the activity giving rise to the pressure.

In accordance with CIS Guidance Document No. 3, a pressure is defined as the direct effect of an environmentally relevant human activity (e.g. an effect leading to a change in discharge or a change in water[15] quality) In the case of surface waters, a pressure is to be classified as significant if it endangers the achievement of the environmental objectives or results in failure to achieve them. Significance thresholds were agreed as guidance on the question of when a pressure can in all probability be expected to exist. This means, for example, that in the field of point sources it is not necessary to consider all discharges, but only those exceeding a certain size. When assessing whether a pressure is significant for a given water body, the pressure must be considered in relation to the water body. For example, the same discharge by a municipal sewage plant has a greater impact on a small water body than on a large one[16]. A similar example can be constructed for water abstraction: The abstraction of a quantity of water need not have significant impacts if it takes place continuously throughout the year, but it may constitute a significant pressure if it takes place during two summer months only[17].

In the case of groundwater, the WFD does not speak of significant pressures, but of pressures or anthropogenic impacts. It requires that all pressures giving rise to actual impacts on the groundwater body must be registered and included in the analysis[18]. On closer examination, not every pressure on groundwater is found to have such a serious impact that the groundwater body is at risk of failing to achieve the environmental objectives.

Assessment of the pressures and impacts is based on current immission data and the provisional evaluation findings. In addition to evaluation of the data, the question of whether a pressure exists is decided by locally available knowledge about application conditions and other expert knowledge. If pressures are identified, the programme of measures must include appropriate measures to reduce or completely eliminate the impacts of these pressures. In addition to reaching conclusions about the measures to be taken, another reason for

[15] EU-Kommission 2004b, Annex II, page 105.
[16] LAWA 2013a, page 21
[17] EU-Kommission 2004b, page 22
[18] LAWA 2013c, page 2

recording the pressures is to estimate the risk of failure to achieve the objectives in 2021 (cf. Chapter 3).
The relevant pressures on the water bodies have been made public through discussions about the important water management issues.

2.2 Significant pressures on surface waters

The review of data on significant pressures shows that numerous pressures on bodies of water continue to exist and endanger the achievement of the objectives. In order to identify significant pressures due to point sources and diffuse sources, reference is made to existing EU provisions. These include the Urban Wastewater Directive (91/271/EEC), the Directive on Industrial Emissions (2010/75/EC), the Nitrates Directive (91/676/EEC), the Regulation on Approvals of Crop Protection Agents (2009/1107/EC) and the Biocides Directive (98/8/EC).
Not all discharges or abstractions are considered when identifying the significant pressures. The focus lies on major discharges or abstractions. The LAWA working aid lays down appropriate significance thresholds.
For surface waters, the various pressures are grouped in the following sources of/reasons for the pressures:

- Point sources:
  - ⇨ Discharges from municipal sewage plants exceeding 2,000 population equivalents
  - ⇨ Discharges from food factories exceeding 4,000 population equivalents
  - ⇨ Industrial direct dischargers with reporting obligations under the Pollutant Release Transfer Register[19] (PRTR)
  - ⇨ Rainwater discharges and combined water discharges from contiguous sealed surfaces exceeding 10 km²,
- diffuse sources (area-based or linear substance emissions that cannot be directly assigned to a polluter or a point source of emissions),
- water abstraction from rivers in excess of 50 l/s without reintroduction,
- discharge regulation and morphological changes, and
- other anthropogenic pressures (cooling water discharges, salt discharges).

Unlike 2009, the individual plants are no longer to be specified in the management plans. It is also important to take account of the fact that other discharges or abstractions exist which fall below the significance threshold. The statutory provisions on authorisation of discharges and abstractions, and the enforcement of these provisions, guarantee compliance with the requirements of the WFD.

The following chapters show the pressures on surface waters in Lower Saxony that are due to the above-mentioned sources.

[19] Further information can be found at www.thru.de.

2.2.1 Flowing waters

Point sources

All municipal sewage plants and establishments that discharge into bodies of water must conform to the state of the art. In view of these requirements, a very large proportion of the plants concerned do not represent a significant pressure on water bodies in Lower Saxony. Provided sufficiently clear data exist, however, the discharges are classified as a significant pressure especially in cases where the sewage plants discharge into waters with a low performance capacity, e.g. due to low water levels, or where there is a need to improve the plant's purification performance.
The following table shows the bodies of water for which a significant pressure due to discharges from municipal sewage plants has been identified.

Table 18: Overview of water bodies with significant pressures due to discharges from municipal sewage plants[20]

Water body number	Water body name
04046	Soeste Mittellauf bis Thülsfelder Talsperre
15021	Warne
15056	Lange Welle (Mittelgraben)
15058	Mühlengraben
17051	Berger Bach
24025	Visselbach
28008	Neetze (Oberlauf), Süschenbach, Strachau, Kalberlah, Harmstorfer Bach
28038	Röbbelbach (Ober- und Mittellauf), Gollernbach
28039	Wipperau (Mittel- und Unterlauf)
29055	Wischhafener Süderelbe
30002	Oste (Ramme-Bremervörde)
30003	Oste (Bremervörde-Oberndorf)
30043	Horsterbeck Mittellauf

- Significant pressures due to discharges from municipal sewage plants were found to exist at 13 flowing water bodies in Lower Saxony.

  As a result of these discharges, these waters display elevated concentrations of nutrients. This results in eutrophication phenomena such as increased plant growth and algal blooms combined with oxygen deficiency. It may also lead to unnatural changes in species composition.
- Discharges from installations subject to PRTR reporting requirements, from food factories and rainwater and combined water discharges do not constitute any significant pressure in Lower Saxony.

[20] This pressure is indicated by "p8" in Table 96.

The LAWA rules require investigation of salt inputs of more than 1 kg per second. In Lower Saxony there are currently only a small number of industrial operations that discharge more than 1 kg of salt (chloride) per second. Such discharges only occur in large water bodies. For this reason the discharges do not give rise to any significant pressures.
There are nevertheless some water bodies with high chloride and sulphate levels. The reasons for this are many and various. To some extent these highly levels are due to discharges into water bodies located outside Lower Saxony. The best-known example is the production location on the Werra.
Further cases of contamination with salt exist in connection with the discharge of water from coal mining at Ibbenbüren in North Rhine Westphalia or from former (potash) mining sites in Lower Saxony, e.g. in the Aller catchment area. Elevated chloride and sulphate levels in rivers can also be caused by inflows from near-surface salt-rich aquifers.
Elevated salt levels cause physiological stress in freshwater organisms, and increasing concentrations, e.g. chloride in excess of 200-400 mg/l, may even have lethal effects. This may result in species impoverishment due to the loss of sensitive freshwater species, and may range up to mass development of salt-tolerant species typical of brackish water. Very high salt concentrations can lead to biological devastation of the water body.

- Significant pressures due to point sources[21] were found to exist at 34 flowing water bodies in Lower Saxony.

The change in water quality influences the river-typical species composition of the water body.

Diffuse inputs

Nutrients from diffuse sources

Contamination from nutrients, nitrate and phosphate, originating from diffuse sources is one of the main problems of water bodies in Lower Saxony and belongs to the important water management issues in Lower Saxony and the river basins. The analysis of deficits shows that nearly all flowing waters in Lower Saxony display significant nutrient contamination. Moreover, the rivers transport dissolved nutrients, especially nitrate, over long distances. The mean annual total concentration of nitrates (2008 - 2012) in Lower Saxony's rivers is around 4.2 mg/l. Of the measuring stations in Lower Saxony, 86% fail to comply with the environmental objectives of the WFD and the 2.8 mg/l total nitrate objective of the MSD for the transitional zone from limnic to marine conditions (LAWA 2014b). Thus hinterland nitrate inputs make a very considerable contribution to eutrophication in coastal waters. An overview of the current nutrient situation in rivers is provided by the publication "Lower Saxony water body monitoring system, Nutrients in Lower Saxony surface waters" (NLWKN 2014a).
It is very difficult to estimate diffuse inputs, as they are virtually impossible to measure. In many cases substance input models, such as AGRUM^{+}-Weser (2014) or Moneris, are used

[21] This pressure is indicated by "p13" in Table 96.

to determine the principal input paths in the river basins. Another means of identifying diffuse substance inputs is to consider impacts, and thereby deduce a significant substance input in connection with land use. The main input paths are the various agricultural uses.
As a first approximation, the uses were analysed in Lower Saxony in accordance with the rules of the LAWA working aid. The criteria are as follows:

- proportion of arable land > 40%,
- proportion of root crops incl. maize > 20% of arable land (for > 40% of arable land),
- proportion of special crops (wine, fruit, hops, vegetables) > 5% of arable land (for > 40% of arable land),
- livestock units per hectare of agricultural land > 1.5.

Significant contamination with nutrients is assumed to exist if one of the above criteria is satisfied. In addition to considering land use, the monitoring findings are also taken into account. Reducing nutrient inputs is a new focal area in the Lower Saxony contribution to the programmes of measures for the river basins.

- Significant pressures due to nutrients from diffuse sources as a result of agricultural activities (due to seepage, erosion, run-off, drainage, afforestation and changes in use)[22] were identified in 1,214 flowing water bodies in Lower Saxony.

As a result of these pressures, there is an increase in the concentration of nutrients in the water bodies. This results in eutrophication phenomena such as increased plant growth and algal blooms combined with oxygen deficiency. It may also lead to unnatural changes in species composition.

Pollutants from diffuse sources

The identification of significant pressures due to pollutants was based entirely on considering the monitoring findings. The diffuse sources vary depending on the substance that is responsible for non-compliance with good chemical status. The transposition of Directive 2008/105/EC in the Surface Waters Ordinance led to the introduction of a more stringent environmental quality standard for mercury in biota . Since mercury is used in a wide variety of production processes and gives rise to gaseous emissions, mercury can be found in all water bodies (cf. Chapter 4.2.3). As a result, all water bodies throughout Lower Saxony are subject to pressures from diffuse sources.
Apart from mercury, it is polycyclic aromatic hydrocarbons in particular, such as benzo(ghi)perylene or fluoranthene, that find their way into the atmosphere via combustion processes and enter the water bodies by means of atmospheric deposition. Inputs are also possible via “transport and infrastructure” emission sources, because polycyclic aromatic hydrocarbons are used in road surfaces, ships’ paints, or for impregnating railway sleepers.

[22] This pressure is indicated by “p21” in Table 96.

Furthermore the substance tributyl tin, which has been banned worldwide since 2008, has been found in the water bodies.
In the case of isoproturon, which belongs to the crop protection agents, diffuse inputs due to agricultural activities and atmospheric deposition are relevant. In Lower Saxony, legacy mining contamination in the Harz region also plays a significant role in cadmium contamination of surface waters in the relevant catchment area (cf. Chapter 4.2.3).

- Significant pressures due to pollutants from diffuse sources as a result of agricultural activities (due to seepage, erosion, run-off, drainage, afforestation and changes in use) have been identified in three flowing water bodies in Lower Saxony.
- Significant pressures due to pollutants from diffuse sources as a result of transport and infrastructures without connection to the sewerage system (ships, railways, cars, aircraft and their associated infrastructure outside urban areas)[23] have been identified in 96 flowing water bodies in Lower Saxony.
- Significant pressures due to pollutants from other diffuse sources[24] have been found to exist in all flowing water bodies in Lower Saxony. Other diffuse sources include outputs from contaminated sediments, soils or abandoned industrial areas. Inputs via atmospheric deposition are subsumed under other diffuse sources.

The resulting impact is contamination of the water bodies with priority substances or other specific pollutants.

Water abstraction from flowing waters without reintroduction

The LAWA working aid provides various criteria for covering abstraction. As in the case of the initial inventory and the 2009 management plan, the criterion continues to be abstraction in quantities exceeding 50 l/s. The decisive factor is the approved annual abstraction quantity. Abstraction on this scale only takes place in a small number of surface waters, e.g. the Oker or the Aller, for major industrial operations. There is no indication that the impacts of such abstraction on the quality elements are so negative as to make it impossible to achieve good ecological status or potential.

- Abstraction of water from rivers does not give rise to any significant pressures on water bodies in Lower Saxony.

Discharge regulation and morphological changes

The water bodies in Lower Saxony are part of the cultural landscape and have been adapted to the various uses in and on the waters. The intensity of water body development, which is reflected in discharge regulation systems and morphological changes, shows great variations in the different physiographic regions of Lower Saxony. The great pressure that uses exert

[23] This pressure is indicated by “p22” in Table 96.
[24] This pressure is indicated by “p26” in Table 96.

on the water bodies is also evident from the large number of heavily modified waters (cf. Chapter 4.2.2).

The impacts of water body development are clear from the number of transverse structures and the structural mapping findings. Transverse structures with their regulating effect on discharge interrupt the continuity of flowing waters. They largely form barriers to migration for aquatic life forms and may therefore exert a significant influence on the ecological status of waters. Transverse structures bring about changes in hydraulic conditions (e.g. temperature, oxygen concentration, substrate composition), with the result that species adapted to flowing waters above and below the transverse structure can no longer take advantage of these habitats. This applies particularly to water bodies which, as migration routes, are of great importance for the fish fauna, especially long-distance migratory fish such as salmon, sea trout, eel. The inventory in accordance with the WFD took in transverse structures with a fall height of 30 cm or more.

In Lower Saxony, the inventory covered a total of about 4,500 transverse structures (cf. Table 19). A large number of structures for discharge regulation and other purposes also exist on the tributaries. Some 1,200 structures are situated in migration routes and in spawning grounds and nursery waters.

Table 19: Total number of transverse structures ≥ 30 cm, and number of transfer structures in migration routes and spawning and nursery waters

Number of transverse structures	Transverse structures in migration routes	Transverse structures in spawning and nursery waters
4,473	234	966

Against the background of the first assessment of flowing waters in 2009, and in order to permit more targeted planning of management and measures, a detailed structural map of approximately 10,000 km of Lower Saxony's rivers with great development potential (priorities 1 to 6) was prepared during the period 2010 to 2014. Unlike the overview approach, the detailed structural map examined the structure of the water bodies in 100-metre sections, i.e. approximately 100,000 sections. The structural mapping clearly reveals the pressures on the bodies of water. A total length of about 10,000 km of rivers in Lower Saxony was reassessed from a structural point of view (cf. Fig. 5). Structural class 1 (unmodified river sections) was not mapped.

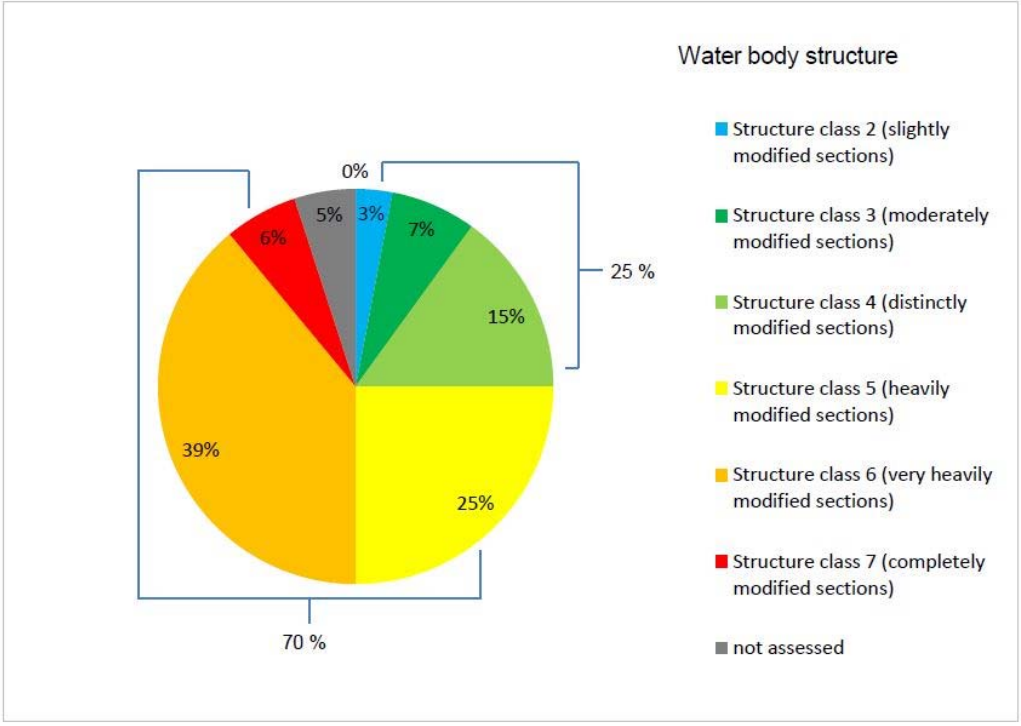


Fig. 5: Overall result of detailed structural mapping (mapping period 2010 – 2014) – The percentages relate to the total river length mapped

As in the first planning period, improving water body structure and continuity continues to be one of the major water management issues in Lower Saxony. The constructional measures inhibited morphodynamic processes (inherent development) in the majority of water bodies. In addition, such rivers frequently undergo intensive maintenance to safeguard their discharge rates.

- Water body development[25] represents a significant pressure on 1,539 flowing water bodies in Lower Saxony.

The impacts of this pressure are varied and far-reaching. They can bring about lasting changes in the water body habitat and lead to impoverishment of the aquatic communities.

Miscellaneous anthropogenic pressures

Miscellaneous anthropogenic pressures include cooling water discharges with a heat load in excess of 10 megawatts. Cooling water discharges involving such high heat loads occur in only a small number of cases in Lower Saxony, e.g. nuclear power plants. In many cases cooling water with heat loads corresponding to the significance criterion is only discharged into large water bodies of suitable capacity. As a result, the discharges currently taking place in Lower Saxony do not present any obstacle to achieving the objectives of the WFD.

[25] This pressure is indicated by “p57” in Table 96.

No other miscellaneous anthropogenic pressures are known.

- Discharges of water into rivers do not give rise to any significant pressures on water bodies in Lower Saxony.

2.2.2 Standing waters

Point sources

All municipal sewage plants and establishments that discharge into bodies of water must conform to the state of the art. In view of these requirements, a very large proportion of the plants concerned do not represent a significant pressure on water bodies. Of the list of installations compiled on the basis of the significance criterion, only one gives rise to a significant pressure as a result of the rainwater and combined-water discharge at Steinhuder Meer. In particular the phosphate inputs entering via this point source present an obstacle to achieving the objective of good ecological status in the Steinhuder Meer. No significant pressures due to point sources were identified at any of the other 26 lakes required to be considered under the provisions of the WFD.

- Discharges of rainwater and combined water[26] only represent a significant pressure in the case of Steinhuder Meer. These discharges result in nutrients and organic pollution entering the water bodies.
- Discharges from municipal sewage plants, food factories and installations subject to PRTR reporting requirements do not constitute any significant pressure on lakes in Lower Saxony.

Diffuse sources

Nutrients from diffuse sources

Nutrients from diffuse sources continue to represent a significant pressure, and are a major problem when it comes to achieving the objectives for the lakes in Lower Saxony. Hydromorphological pressures play a secondary role. The heavy nutrient loads from diffuse sources within the lake catchment areas lead to increased algal growth, temporary oxygen deficiency and faster silting up. This is due to agricultural use in the catchment areas. The latest monitoring data underlying the ecological assessment revealed a significant pressure. The crucial factor here is the phytoplankton quality element. This consideration is supported by the phosphate monitoring data. Phosphate is one of the general physico-chemical quality elements that are examined to support the assessment of ecological status or potential (cf. RaKon B II and Chapter 4.2.2).

[26] This pressure is indicated by “p9” in Table 96.

- Significant pressures due to nutrients from diffuse sources as a result of agricultural activities (due to seepage, erosion, run-off, drainage, afforestation and changes in use) were identified in 17 standing water bodies in Lower Saxony.

This pressure results in high nutrient concentrations which increase the trophic potential of the lakes.

Pollutants from diffuse sources

The identification of significant pressures due to pollutants was based entirely on considering the monitoring findings. The diffuse sources vary depending on the substance that is responsible for non-compliance with good chemical status. The transposition of Directive 2008/105/EC in the Surface Waters Ordinance as currently in force led to the introduction of a more stringent environmental quality standard for mercury in biota. Since mercury is used in a wide variety of production processes and gives rise to gaseous emissions, mercury can be found in all water bodies (cf. Chapter 4.2.3). As a result, all water bodies throughout Lower Saxony are subject to pressures from diffuse sources. In addition to tributyl tin, which was used in antifouling paints for ships until it was banned worldwide in 2008, the main factor is polycyclic aromatic hydrocarbons in concentrations exceeding the environmental quality standards (cf. Chapter 4.2.3).

- Significant pressures due to pollutants from diffuse sources as a result of transport and infrastructures without connection to the sewerage system (ships, railways, cars, aircraft and their associated infrastructure outside urban areas) have been identified in two standing water bodies in Lower Saxony.
- Significant pressures due to pollutants from other diffuse sources have been found to exist in all standing water bodies in Lower Saxony. Other diffuse sources include outputs from contaminated sediments, soils or abandoned industrial areas. Inputs via atmospheric deposition are subsumed under other diffuse sources.

The resulting impact is contamination of the water bodies with priority substances or other specific pollutants.

Discharge regulation and morphological changes

Discharge regulation gives rise to unnatural fluctuations in storage levels, leading to considerable adverse effects on macrophytes and benthic invertebrates, which make it impossible to assess these biological quality elements. In artificially created excavated lakes (gravel pit lakes), recolonisation by aquatic organisms and hence the regeneration capacity of the water body are adversely affected by excessively steep and structurally bad shore zones lacking in shallow water areas. Shore areas that are disturbed or have extremely bad structures can give rise to increased erosion processes and increased nutrient inputs into the water body, which can raise the trophic potential of the lake and cause its ecological status to deteriorate.

- Significant hydro-morphological pressures due to
  - discharge regulation[27] have been identified at nine lakes in Lower Saxony.
  - Changes in or loss of shore and water meadow[28] zones were found at six lakes.

The impacts of these pressures are both various and drastic. They can bring about lasting changes in the water body habitat and lead to impoverishment of the aquatic communities.

Miscellaneous anthropogenic pressures

The fishing uses at Maschsee result in elevated stocks of carp. The lake also contains grass carp, which feed on aquatic plants. The dabbling feeding habits of the carp cause considerable damage to the underwater vegetation and release additional nutrients. Such damage has also been shown to exist at the artificial lakes of Tankumsee, Koldinger Kiessee and Baggersee Schladen.
A miscellaneous anthropogenic pressure resulting from the use of mowing boats has also been shown to exist at Maschsee.

- Significant pressures due to fisheries and amateur fishing[29] occur at four lakes in Lower Saxony.
- Other significant anthropogenic pressures[30] occur at Maschsee due to the use of mowing boats.

The impacts take the form of large-scale damage affecting the biological quality element “macrophytes” and additional release of nutrients from the sediment due to the dabbling feeding habits of the carp-like fish.

2.2.3 Transitional and coastal waters

Management of the coastal waters under the WFD will in future be supplemented and supported by the implementation of the Marine Strategy Directive. New focal areas are set by the objectives for the quality of coastal waters and a coordinated monitoring system with supra-regional measures (e.g. waste). The pressures on coastal waters frequently result from supra-regional situations and therefore have to be managed jointly with all neighbours bordering on the marine waters (e.g. North Sea sub-region). This supra-regional coordination requirement of the Marine Strategy Directive supplements the quality demands of the WFD and extends them beyond the limits of national responsibilityto create a European standard for marine waters.

[27] This pressure is indicated by “p49” in Table 96.
[28] In Table 96 this pressure is indicated by “p58”.
[29] In Table 96 this pressure is indicated by “p84”.
[30] In Table 96 this pressure is indicated by “p89”.

Point sources

All municipal sewage plants and installations that discharge into transitional and coastal waters are in line with the state of the art, and in each case the monitoring values measured are equal to or better than the relevant statutory requirements. Pollutant inputs may give rise to isolated pressures, but on the whole they are of secondary importance for the quality of the transitional and coastal waters.
During the last management period, the pollutant load plan was developed to manage point source inputs into the Jade. Efforts are being made to draw up further load plans.

- Discharges from municipal sewage plants, food factories and installations subject to PRTR reporting requirements, and discharges of rainwater and combined water do not constitute any significant pressure on transitional and coastal waters in Lower Saxony.

Diffuse sources

Nutrients from diffuse sources

The predominant substance pollution in transitional and coastal waters takes the form of nutrient inputs (nitrate and phosphate), especially from the hinterland catchment areas of the North Sea. For Lower Saxony in particular, this situation is one of the most pressing water management issues. In spite of the efforts in recent years to reduce inputs from the hinterland, the monitoring results continue to show significant nutrient pollution that prevents the achievement of good ecological status. There is a considerable need for reduction, especially in the case of nitrate inputs. Particularly in the late autumn and winter months, considerable nutrient loads are fed into the coastal water bodies from the hinterland. This accumulation of nutrients (eutrophication) gives rise to increased algal growth (algal blooms, carpets of blue-green algae). In turn, the resulting turbidity of the water has an influence on the growth of bottom-dwelling plants. For example, the decline in seagrass beds is also being discussed in connection with an increase in eutrophication. In extreme cases, microbial degradation of the resulting surplus of vegetable biomass can lead to oxygen deficiency on the seabed and in near-bottom water layers.
In addition to the substance inputs from the hinterland, transport from neighbouring parts of the sea and inputs from the atmosphere also contribute to the elevated nutrient concentrations in coastal waters.

- Significant pressures due to nutrients from diffuse sources as a result of agricultural activities (due to seepage, erosion, run-off, drainage, afforestation and changes in use) have been identified in all transitional waters and ten coastal waters in Lower Saxony.

The impacts of this significant pressure take the form of high nutrient concentrations.

Pollutants from diffuse sources

The identification of significant pressures due to pollutants is based entirely on considering the available monitoring findings. The diffuse sources vary depending on the substance that is responsible for non-compliance with good chemical status. The transposition of Directive 2008/105/EC in the Surface Waters Ordinance as currently in force led to the introduction of a more stringent environmental quality standard for mercury in biota. Since mercury is used in a wide variety of production processes and gives rise to gaseous emissions, mercury can be found in all water bodies (cf. Chapter 4.2.2). As a result, all water bodies throughout Lower Saxony are subject to pressures from diffuse sources.
In addition to mercury, the polycyclic aromatic hydrocarbons benzo(a)pyrene and benzo(ghi)perylene in particular and, in isolated cases, fluoranthene have to be mentioned as substances that are ubiquitous in the environment. They originate largely from combustion processes. The fact that these substances accumulate on solids leads to relatively high concentrations of these substances being found at measuring stations with high turbidity levels, for example in transitional waters.
Tributyl tin, which was used as an antifouling paint for ships until its worldwide ban in 2008, also exceeds the environmental quality standards in transitional waters. Today the main pressures due to tributyl tin, which is very persistent, result from bottom sediments that are still contaminated due to earlier inputs (especially ports, deposition areas in estuaries with fine sediments that remain undisturbed for long periods). Their management therefore requires special regulations. The relevant regulations in force in Germany (joint transitional provisions for handling excavated material in coastal waters) are currently being revised.

- Significant pressures due to pollutants from diffuse sources as a result of transport and infrastructures without connection to the sewerage system (ships, railways, cars, aircraft and their associated infrastructure outside urban areas) have been identified in six coastal waters and all transitional waters in Lower Saxony.
- Significant pressures due to pollutants from other diffuse sources have been found to exist in all coastal waters and all transitional waters in Lower Saxony. Other diffuse sources include outputs from contaminated sediments, soils or abandoned industrial areas. Inputs via atmospheric deposition are subsumed under other diffuse sources.

The resulting impact is contamination of the water bodies with priority substances or other specific pollutants.

Discharge regulation and morphological changes

Together with the adjacent offshore and onshore water bodies of the coastal and inland waters, the transitional water bodies form the estuaries of the Elbe, Weser and Ems. The estuaries are used as shipping and trade routes. In line with the growing demands of marine shipping, these waters have repeatedly been adapted and developed in the past. Applications for authorisation to dredge out deeper navigation channels are currently in progress for all three estuaries.

In the course of these developments, the main channel (fairway) has repeatedly been widened and deepened, and its position stabilised by means of river structures. These and other measures have resulted in increased current speeds and in a targeted concentration of the ebb and flood tides on the main channel – with the aim of stepping up the clearing effect. As a result of polder formation and the creation of land for settlement, industrial, port and agricultural purposes, there have also been considerable losses of shore and marsh areas and flood spaces. In principle, these constructional interventions have taken place in all sections of the estuary, though the scale has varied from place to place. Their impact is felt in particular in the limnic-dominated water bodies of the marsh streams and rivers (inland waters) and in the transitional waters.
Problematic side effects of these encroachments are a considerable lowering of mean low tide levels combined with a marked increase in tidal range, especially in the inner estuaries, and changes in tidal symmetry (flood tide dominance). Other changes relate to the sediment balance (sediment transport, sedimentation and erosion processes). Other factors observed include rising concentrations of suspended solids and bed loads, increased turbidity, sedimentation in the lateral areas of water bodies, losses of area or quality in shallow water zones, tidal mud flats and marshes.
The hydrological and morphological changes mentioned give rise to a wide variety of impacts on the biological quality elements.
The effects described occur to varying extents in the estuaries of the Elbe, Weser and Ems (and in individual sections of the estuaries). For example, losses affecting shallow water zones and marshes are found above all in the upper (limnic and oligohaline) sections of the estuaries. Particularly on the Elbe and the Ems, the hydromorphological changes lead to a marked dominance of flood tides and to tidal pumping (transport of fine sediments up river). Particularly in the summer months, the high suspended solids concentrations, great fairway depths and lack of shallow water zones of adequate size and quality give rise to oxygen deficits in the upstream sections of both estuaries, especially at times of high temperatures and low upstream discharges. The hydromorphological changes mentioned result in the transitional waters being designated as heavily modified water bodies, because the required alterations would have considerable adverse effects on use.
Even if constructional changes or primary impacts only relate solely or largely to the transitional waters or the limnic-dominated part of the estuaries, the indirect impacts in the estuaries are usually much more far-reaching and may be reflected in adjacent coastal water bodies. This must be taken into account in the course of management activities, and the estuary must be treated as a functional unit extending beyond the boundaries of individual water bodies. The preparation of sediment management plans for the estuaries of Elbe and Weser by the Waterways and Shipping Directorate has made initial contributions to analysing and limiting pressures in an overarching management approach.

- Significant hydromorphological pressures occur on all transitional waters as a result of:
  - water body development,
  - changes in/loss of bank and water meadow areas,

- o dredging and wet excavation[31].

The impacts of this pressure are varied and far-reaching. They can bring about lasting changes in the water body habitat and lead to impoverishment of the aquatic communities.

Discharge regulation and morphological changes also affect the coastal waters, but on present knowledge they do not prevent the achievement of good status.
In the coming years, further studies are to be made under various projects, e.g. including the implementation of the Marine Strategy Framework Directive, to investigate the intensity of pressures resulting from the changes for all coastal waters.

Miscellaneous anthropogenic pressures

Further anthropogenic pressures, e.g. due to fisheries and redeposition of sediments, act on the transitional and coastal waters. To date, it has not been possible to identify them as significant pressures.
In the coming years, further studies are to be made under various projects, including the implementation of the Marine Strategy Framework Directive, to investigate the intensity of pressures for all coastal and transitional waters.

- No significant pressures due to miscellaneous anthropogenic pressures occur in Lower Saxony's transitional and coastal waters.

An overview of the water bodies affected by significant pressures can be found in Appendix A-4, Table 96.

2.3 Pressures on groundwater

The data to be compiled and kept pursuant to Annex II 2.1 to the WFD and Annex 1 to the groundwater ordinance in the context of the inventory are to reflect the nature and extent of the anthropogenic pressures affecting groundwater bodies in Lower Saxony. The impacts of the pressures identified for the groundwater bodies in Lower Saxony are to be described.

In the basic description of pressures that may affect groundwater bodies, the WFD distinguishes between

- diffuse sources of pollution,
- point sources of pollution,
- groundwater abstraction, and
- artificial groundwater recharge.

[31] In Table 96 this pressure is indicated by "p63".

Diffuse sources of pollution

Inputs from agricultural or urban use, from mining activities or leaking sewers may be relevant to pressures on groundwater from diffuse sources. In view of the fact that it mostly occurs over large areas, diffuse pollution is capable of presenting threats to groundwater bodies.

Elevated nitrate concentrations occur throughout almost all groundwater bodies. These pressures are taken up in the main water management issues. On the basis of the immission approach, the use form “agricultural land” is identified as the main input source with regard to the limit values laid down for the parameters nitrate and crop protection agents. Especially in the case of nitrate, the other potential sources play no more than a minor role.

Other pressures identified are relevant findings of crop protection agents and elevated cadmium concentrations in excess of defined geogenic background concentrations.

The underlying data used to determine diffuse pollutant sources were land use data, agricultural statistics (emission approach) and groundwater quality data (immission approach):

- Immission: Findings of WFD monitoring network:
  - ⇨ Latest annual means (data up to 2012)
  - ⇨ Trend analysis (2007-2012)
- Emission: Potential nitrate concentrations in seepage water (LBEG 2013)

- Pressures due to inputs from diffuse sources as a result of agricultural activities (e.g. application of fertilisers and crop protection agents, livestock density etc.)[32] were identified for 43 groundwater bodies in Lower Saxony.
- Pressures due to other diffuse sources[33] were identified for eight groundwater bodies.

The pressures identified give rise to elevated nutrient concentrations and pollutant inputs.

Point sources

Pressures on groundwater due to point-source pollution may result from legacy deposits, contaminated sites, landfill sites, groundwater damage or armament contamination sites.
In Lower Saxony, point-source inputs are only of secondary importance when it comes to pollution of the groundwater. Only in the Harz, the Harz foothills and the Leine and Aller coordination spaces are there scattered pollutant inputs due to former mining activities. These are kept under observation by the local soil protection authorities.
The following criteria are relevant to the assessment of point-source pollution:

[32] In Table 103 this pressure is indicated by “p27”.
[33] In Table 103 this pressure is indicated by “p30”.

- present and expected extent of pressures,
- nature, properties, toxicological and eco-toxicological potential of the pollutants, and
- geological conditions.

It is also necessary to consider whether the point sources could cause significant damage to a surface water body or a groundwater-dependent terrestrial ecosystem.

- Point-source inputs do not represent a significant pressure on groundwater bodies in Lower Saxony.

Groundwater abstraction

The most frequent pressures on the quantitative status of a groundwater body arise from long-term abstraction of groundwater. The main factors involved are

- abstraction for drinking water and process water supplies,
- abstraction for irrigation and watering purposes,
- sump dewatering measures connected with mining or major construction activities,
- lowering groundwater levels in the extraction of non-metallic minerals, and
- long-term hydraulic measures for groundwater remediation.

Groundwater abstraction has an impact on groundwater levels and/or groundwater currents, even at some distance from the abstraction site and possibly in multiple groundwater storeys. Lowering groundwater levels can result in surface waters or rising springs drying out, lowering of near-surface groundwater, and resulting deterioration of groundwater-dependent surface water and terrestrial ecosystems[34]. The pressures exerted on relevant environmental goods by groundwater abstraction are identified by analysing methodological approaches, which are explained in more detail in Chapter 4.3.2.

A pressure is identified by examining the balances of the relevant parameters, such as actual groundwater abstraction or water rights granted for groundwater recharge, and by analysing the latest monitoring data such as groundwater levels or spring discharge. In addition to the relevant balance parameters, such as water rights granted and groundwater recharge, Table 96 [in Appendix B-1] also shows the relevant degree of exploitation of the available groundwater resource for the individual groundwater bodies. As a rule, the actual mean abstraction figure is less than the total of the water rights granted. There are considerable differences between the individual groundwater bodies as regards abstraction percentages.

[34] LAWA 2013c, page 16

In the case of the groundwater bodies listed below, inadequate data or an inadequate basis for assessment make it impossible to provide a definitive assessment of the pressure situation within Lower Saxony (cf. Chapter 3.1.3):

- Leda-Jümme unconsolidated rock, left,
- Große Aa,
- Wietze/Fuhse unconsolidated rock, and
- Leine unconsolidated rock, left.

- Abstraction of water from the groundwater does not give rise to any significant pressures on water bodies in Lower Saxony.
- Further studies are needed for four groundwater bodies.

Artificial groundwater recharge

Artificial groundwater recharge raises groundwater levels and therefore represents an intervention in the quantitative status of the groundwater. In general, however, artificial groundwater recharge sets out to alleviate the impacts of temporary or spatial over-exploitation of groundwater resources and re-stabilise the quantitative balance of the groundwater. Thus in terms of the quantitative status of the groundwater, targeted artificial groundwater recharge does not constitute a pressure. As a rule it has to be stated, but there is no need for further investigation[35].

Groundwater recharge does not take place on any appreciable scale in Lower Saxony. However, in view of the increased demands by the agricultural sector on groundwater quantities, the focus on this issue has increased in recent years. Changes in agricultural structure and regional climate increase the demand for irrigation water. Various pilot projects, such as AquaRo in the Uelzen rural district, are therefore being run to develop and test ideas and practical approaches to groundwater recharge.

- Artificial groundwater recharge does not constitute a pressure in Lower Saxony.

An overview of the water bodies affected by significant pressures can be found in Appendix B-3, Table 103.

2.4 Conclusions

As a result, it can be concluded that diffuse pressures due to nutrients continue to be an obstacle to achieving the objectives for the majority of water bodies in the surface waters and groundwater sectors. In the case of groundwater bodies, the nitrate inputs from agricultural use were identified as a pressure.

[35] LAWA 2013c, page 18

In addition, pressures on surface waters occur due to hydromorphological changes and discharge regulation. For the second management period there is now also a greater focus on pressures due to pollutants in surface waters. The reason for this is the more stringent environmental quality standards, which result in a significant pressure being identified for all surface waters because of the ubiquitous occurrence of mercury in biota. Other sources of pressure, such as nutrient inputs from municipal sewage plants or point-source discharges of production waste water containing salt, occur in surface waters in isolated cases, but are of minor importance from a state-wide point of view.

As a result, the identified pressures on water bodies confirm the important water management issues in Lower Saxony for the second planning period:

- Reducing pollution by nutrient and pollutant substances in surface waters and groundwater
- Improving the water body structure and continuity of surface waters

The impacts of climate change are not yet making their effects on pressures felt at the present time. Addressing this issue will however become increasingly important.

An overview of the water bodies affected by significant pressures can be found in Appendices A-4 and B-3.

In the second management period, substance inputs from agricultural land use continue to be a dominant problem for the achievement of WFD objectives, and adequate reduction of such inputs will only be possible by means of a combination of adapted regulatory law and voluntary measures. This applies not only to Lower Saxony, but also on a similar scale to other federal states. Adapting regulatory law is largely the task of the federal authorities, as they are responsible for transposing the Nitrates Directive.

The subjects of agriculture and global development, and the connection with water conservation, are addressed in the following excursus prepared by LAWA:

Excursus II: Agriculture and global development (LAWA, 2014)

A tangible change in agricultural structure presents a further obstacle to achieving the objectives in relation to agricultural emissions. In recent years, there has been a sharp increase in demand for agricultural biomass for food production and energy-oriented uses. This development is partly linked with intensification of the agricultural sector, and also partly with changes in crop growing systems. The impacts of this development vary from region to region. For example, there has been a very sharp increase in maize growing in some federal states. As a result of current maize growing practice, this is tending to increase rather than reduce nitrate inputs into the soil and groundwater, and from there into surface waters. At the same time there is an increase in inputs of soil particles, phosphate and possibly also crop protection agents into surface waters.
The changed and still changing conditions arising partly from globalisation effects of worldwide agriculture in conjunction with developments on the global agricultural and raw materials markets, are making it more difficult to achieve the objectives of the Water Framework Directive. They call for much earlier and more intensive efforts to address the global, European and national issues in the agricultural sector, and for adaptation of the programmes of measures.

Current agricultural and environmental conditions, and conflicts of objectives with water conservation

The agricultural sector in Europe and Germany is primarily geared to producing foods of animal and vegetable origin (food and animal feeds). With farmland making up approximately 52% of its area, Germany is Europe's biggest producer of milk, pork and rape, and the second largest producer of cereals and beef (statistical offices' agricultural census 2010).
In view of the features of the physiographic regions, widely differing production locations have developed in the individual federal states. The most important segments are fodder growing, with about 43% of farmland, and arable farming with 28%. Permanent crops account for 8% and mixed farming for 15%.
In addition to a continuous decline in the area of farmland, ongoing structural changes are taking place in the agricultural sector. For example, it is noticeable that a process of concentration and intensification of livestock farming is taking place in various regions, and also that renewable energy sources, especially biogas production, are playing an increasing role in the development of additional income options. Both these developments are contributing to regional increases in nutrient volumes, thereby giving rise to problems with proper distribution and use over large areas.

It should be noted that this situation gives rise to differences between the federal states as

regards the nature and extent of pressures on water bodies and their distribution ,and hence the measures designed to achieve the objectives of the WFD.

European agricultural policy

The agricultural sector in Germany has long been dominated by the common agricultural policy (CAP) of the European Union, and has already undergone considerable changes. A drastic change took place with the changeover to the single payment scheme from 2005 onwards. Since then, farmers have received direct payments regardless of the nature and extent of their production, and are obliged to comply with certain standards and requirements (cross-compliance rules). Modulation makes it possible to use funds from the "second pillar" of the CAP to promote environmental measures – including for water conservation.

Among other things, the changeover has resulted in set-aside areas being brought back into production and thereby being lost to water conservation and nature conservation.

The environmental standards to be satisfied include the Nitrates Directive, which is implemented in Germany through the nationwide Fertilisers Ordinance. Even though the Nitrates Report 2012 by the Federal Environment Ministry and the Federal Ministry of Food, Consumer Protection and Agriculture reveals an overall decrease in contamination of the groundwater by nitrates, it has to be said that the Fertilisers Ordinance in its present form is not suitable for guaranteeing groundwater protection within the meaning of the WFD. Indeed, it is apparent that the increase at measuring stations currently showing comparatively low pollution is considerably larger than the decrease at measuring stations with relatively high pollution, which can be taken as an indication of the structural change taking place.

In Germany, the environmental standards for erosion control are specified in the Direct Payment Obligations Act and the associated ordinance. Since 2010, provisions have been in force on protection from erosion as a function of the erosion risk (water and wind erosion) to the individual areas of arable land. Since these provisions fall short of the precautionary requirements for soil protection, it remains to be seen whether they can bring about a sufficient long-term reduction in inputs of soil material into water bodies.

In June 2013, political agreement was reached on the future alignment of the Common Agricultural Policy (CAP). Transitional regulations are in place for 2014, so the new framework does not apply until 2015. The further development of the CAP is intended to take greater account of the future challenges for the agricultural sector, especially with regard to sustainable management of natural resources. The years ahead will show the extent to which water conservation can profit from the new regulations and the "greening" of the CAP can bring about the desired positive impacts on water body status. This also applies to the design of the "second pillar" and the measures it offers. Its success depends to a large extent on its acceptance by the agricultural sector and also on the financial resources available for the promotion measures offered.

The German government's climate policy

According to the National Sustainability Strategy's objectives for developing renewable energy, there is to be a marked increase by 2020 in the proportion of primary energy due to renewable sources. The German government's energy concept of 28 September 2010[36] sets out an ambitious target figure of 18% for the renewables share of final energy consumption in 2020. With a share of about two thirds, biomass is currently the most important source of renewable energy.

Among other things, the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz – EEG) and its incentives have led to an increase in the growing of silage maize. Since the introduction of the bonus for regrowable raw materials in 2004 the area under maize has increased by roughly 850,000 hectares to 2.5 million hectares (Deutsches Maiskomitee). The reasons for this lie in the high methane yield potential, the ease of mechanisation, the storage life and the relatively simple handling of maize silage.

Initial findings from WFD monitoring and various scientific studies show that the growing of silage maize using the methods currently practised in the agricultural sector give rise to contamination of groundwater as a result of elevated nutrient inputs. This leads to elevated nitrate inputs and nitrate concentrations in near-surface groundwater, and consequently in surface waters as well. Furthermore, the ploughing of permanent pasture that has accompanied the increase in maize-growing areas in some federal states has caused considerable releases of nitrogen in the following years. The resulting releases of nitrogen and leaching into the groundwater present an additional problem for soil protection and water conservation, and hence for coastal and traditional waters as well. There is also a marked increase in soil erosion resulting from the increase in maize-growing areas[37].

Since the creation of the state-specific programmes of measures for implementing the WFD in 2009, the area under maize has expanded by a good 400,000 hectares. This is thus counteracting the measures taken to reduce imports of nitrates, phosphates and soil material.

Global aspects of agriculture

The global population totalled around 7.2 billion people[38] in 2013, and is growing at the rate of 80 million a year. To solve the food problem it will be necessary to step up worldwide food production considerably in the decades ahead. This trend is accompanied by a change in food habits in threshold countries such as China, India or Brazil that is bringing them closer to the resource-intensive eating patterns of the industrialised

[36] German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU): Das Energiekonzept der Bundesregierung 2010 und die Energiewende 2011, Berlin, October 2011.
[37] Brandhuber, R., Treisch, M.; Bodenabtrag in Abhängigkeit von der Maisanbaufläche in Bayern: Vergleich 2005 mit 2011, LfL 2012; http://www.lfl.bayern.de/mam/cms07/iab/dateien/bodenabtraege_brandhuber_tagung2012.pdf
[38] Deutsche Gesellschaft für die Vereinten Nationen e. V (DGVN), http://menschliche-entwicklung-staerken.dgvn.de/bevoelkerung

countries (rapid increase in meat consumption). The result of this global trend will be further intensification of agriculture.

Impacts of climate change

Climate change will give rise to changes in farming conditions in Germany as well. To date, watering with groundwater has played only a minor role in agricultural production; roughly 6% of farmers make use of this possibility. It may be of importance on a regional basis, e.g. in the east of Lower Saxony, in Hessen, Brandenburg or Bavaria.
At present it is not possible to estimate the extent to which climate change will make it necessary to use more groundwater for agricultural production. However, it is unlikely to develop into a nationwide problem with regard to deterioration of the quantitative status of the groundwater.
The situation is different when it comes to surface waters and water quality in the groundwater and surface waters. Abstraction of surface waters for watering farmland, especially during heat waves and periods of drought, could lead to or contribute to increasing problems with low water levels.
Moreover an increase in irrigated agriculture, which would in particular support the growing of special crops, could also lead to increased inputs of nutrients and crop protection agents into the groundwater and surface waters.
This will also exacerbate the drought stress situation in drained areas, since rapid run-off reduces the retention capacity of the soil.

Requirements for water-compatible agriculture

From the point of view of water body conservation, the priority objective must be on the one hand to reduce competition between farming and water conservation for land and uses , and on the other hand to design the production of agricultural goods (food and animal feeds, bioenergy, regrowable raw materials) so that it does not involve risks to water bodies and, especially, that there is a marked reduction in nutrient surpluses and/or inputs of nutrients and soil material.
To achieve these objectives, the following requirements will have to be met:

- Strict reduction in nitrate and phosphate fertiliser quantities to the level needed for the individual crops or the nutrient output via the harvest products.
- Inclusion of all mineral and organic fertilisers (including fermentation residues) and greater emphasis on organic fertilisers when calculating application quantities.
- Introduction of binding fertiliser plans, record-keeping obligations and informative nutrient balances (farm-gate balance, but at least on the basis of a plausibilised area-based balance) and submission of these to the competent authorities.
- Extension of the “close season” for fertiliser, especially in the autumn, when there is no crop demand.
- Expansion of storage capacity and proper storage of animal excrement, fermentation residues and animal feeds.

- Compulsory introduction of near ground level application techniques for organic farm yard manure (e.g. towed hose, injection techniques).
- Specification of absolute bans on application, e.g. on water saturated, flooded, frozen soils and sloping land, and distances to be complied with from water bodies.
- Reduction in soil erosion due to appropriate management measures and permanent greening.

These requirements must be implemented at all levels.

- Global level
  The expansion and further intensification of worldwide production of food and animal feeds and of agricultural raw materials must take greater account of the need to protect environmental media and pay greater attention to site-specific requirements in the individual regions.
- European level
  - To improve the protection of environmental media, there must be greater dovetailing of European directives and more rigorous implementation of water conservation requirements.
  - Implementation of Common Agricultural Policy (CAP)
    The CAP to be implemented from 2015 onwards shows points of attack for a more eco-friendly approach to land management. Direct payments (first pillar) are tied to concrete (water-related) environmental services by farmers ("greening"). However, since there is reason to doubt that this will permit an adequate and sustainable reduction in nutrient inputs from the agricultural sector, an evaluation and decisions on more far-reaching requirements regarding environmental services must be undertaken during the financial period ending 2020.
- National level
  - Transposition of the Nitrates Directive / revision of the Fertilisers Ordinance
    The opportunity afforded by the revision of the Fertilisers Ordinance must be used to redesign the legal framework for water-friendly fertiliser application, especially with organic nutrient carriers, and appropriately adapted land management. The action options set out by LAWA in its key issues paper 2012 must be integrated in the revised version of the Fertilisers Ordinance[39].
  - Ordinance on installations for handling substances dangerous to water (AwSV)
    The ordinance procedure must be used to design the handling of substances dangerous to water, which include liquid manure, slurry and silage, in a way that minimises the hazards for water bodies.
  - Review and modification of the EEG
    When revising the Renewable Energy Sources Act (EEG) the scope for adjustment must be used to the full to counteract unfavourable developments and to ensure energy resource production that is both eco-friendly and and site-appropriate in the long term. In the case of new installations, funding should only be provided for installations that avoid the negative impacts identified in the meantime. Substrate-

[39] Bund/Länder-Arbeitsgemeinschaft Wasser – Ausschuss Grundwasser und Wasserversorgung (LAWA AG): Eckpunkte für die Weiterentwicklung des Düngerechts zum Schutz des Grundwassers; LAWA 2012a.

specific payments must be geared more strongly to environmental aspects. Improvements must be made in the promotion of energy-related uses of residual and waste substances in the agricultural sector (farmyard manure such as slurry in biogas plants, use of catch crops and clover grass). There is also a need to foster research into alternative eco-friendly cultivation methods for efficient energy plants and alternative energy plants. Certification of bioenergy sources (biofuels) as a basis for eco-friendly energy plant production is necessary and must in future take greater account of aspects relevant to water bodies. For example, indicators of compliance with multiple crop rotation could prevent concentration of maize growing in the vicinity of biogas plants.

- Design of agro-environmental and climate measures
  Agro-environmental measures to date have not taken sufficient account of the results of the WFD programmes of measures for reducing diffuse pollution of water bodies. They therefore need to be further developed and updated to ensure adequate integration of the latest findings emerging from the preparation and integration phase of the management plans.
- Expansion of organic farming
  The benefits of organic farming with its important and favourable eco-services for water bodies (no use of crop protection agents, reduction in agricultural nitrate surpluses etc.) must be put in a stronger position compared with conventional farming in the national and state-specific agricultural funding programs (EAFRD).
- Avoiding competition for uses and land in the agricultural sector
  From the point of view of water body protection, there is a need for a comprehensive and overarching strategic concept for sustainable eco-friendly design of the production of available biomass (food and animal feeds, biogas, biofuels, bio resources). This is the only way of avoiding competition for uses and land in the agricultural sector at the expense of water body protection.

2.5 Identification of emissions, discharges and losses of priority substances

In Art. 4 (1) a) iv) of the WFD, the EU has defined a “phasing out” obligation in respect of the priority hazardous substances listed in Annex X. In view of their special hazards and accumulation, all anthropogenic inputs into the environment of the 20 priority substances (e.g. mercury, cadmium and tributyl tin) are required to cease completely by 2028 at the latest. In 2008, Directive 2008/105/EC introduced the inventory of emissions, discharges and losses of priority substances, a new instrument for investigating compliance with the prescribed targets of discontinuing or gradually phasing out or reducing substance inputs. Assessment of compliance with these obligations must in particular be undertaken in relation to significant emissions. The inventory makes it possible to investigate whether progress is being made towards achieving the stated objectives with regard to the inputs covered by the inventory. To ensure comparability of the inventory findings throughout Europe, the EU

produced a technical guidance document (CIS Guide No. 28 – “Technical Guidance on the Preparation of an Inventory of Emissions, Discharges and Losses of Priority Substances and Priority Hazardous Substances”) as a working aid for the member states (EU Commission 2012).

Directive 2008/105/EC was transposed into German law in 2011 by means of the Surface Waters Ordinance. Section 4 (2) of the Surface Waters Ordinance requires the preparation of an inventory of emissions, discharges and losses of all priority substances and certain other pollutants including the concentrations of the substances mentioned in Section 11 (1) in biota, suspended solids or sediments. The first inventory was made in 2012 for the period 2007 to 2011. The procedure in Germany is based on the recommendations of the EU technical guidance document.

As a result, a total of five substances were identified as “not relevant” in all ten German river basin units, namely alachlor, benzene, 1,2-dichloroethane, dichloromethane and carbon tetrachloride. Substances classified as relevant on a nationwide basis – and hence in Lower Saxony as well – were the heavy metals mercury, cadmium, lead and nickel, the PAHs anthracene, benzo(b)fluoranthene + benzo(k)fluoranthene, benzo(a)pyrene, benzo(g,h,i)-perylene + indeno(1,2,3-cd)-pyrene and fluoranthene, the pesticides chlorpyrifos-ethyl, diuron, isoproturon, simazine and trifluralin and tetrachloroethylene, trichloroethylene, trichloromethane, C10-13-chloroalkanes, trichlorobenzenes, pentachlorophenol, bis(2-ethyl-hexyl)phthalate (DEHP), pentachlorobenzene, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclohexane, p‘,p'-DDT and the sum of DDT, octyl- und nonylphenol, tributyl tin and brominated diphenylethers.

For all substances identified as “relevant”, a detailed analysis was made on the basis of a multistage method (using various methodological approaches). In Germany this was done using three methodological approaches described in the EU Technical Guide: the river-load related approach, regionalised path analysis (RPA) and substance flow analysis (SFA).

In Lower Saxony, the immission loads measured at the individual reference measuring stations for the river basins were compared with the findings of the regionalised path analysis (RPA). To this end the loads measured at the reference gauges were compared with the total emission of the relevant substance or compound calculated using RPA (MoRe) at the reference measuring station.

In many cases there were problems comparing the RPA results and the immission loads, because measurements were frequently below the detection limit. Nevertheless, the results of the regionalised path analysis using the modelling instrument MoRe (Modelling of Regionalized Emissions) provide an initial description of the emissions, discharges and losses having strict regard to the conditions assumed for modelling purposes. However, there is still a need to fill the existing knowledge gaps in the second management plan that have provisionally been plugged by estimates and assumptions (cf. Chapter 2.3.3 of the Lower Saxony contribution to the management plans 2015 to 2021 for the Elbe, Weser, Ems

and Rhine river basins). A final report by the Federal Environment Agency is expected towards the end of 2014 as a basis for further calculations.

An estimation of the trend will only be possible in the course of the second management cycle. In accordance with Section 4 (2) of the Surface Waters Ordinance, Lower Saxony has undertaken a systematic calculation of the concentrations of the trend parameters, largely in sediments and in isolated cases in suspended solids, starting in 2010. The trend parameters are the priority substances anthracene (No. 2), brominated diphenylethers (No. 5), cadmium (No. 6), C10-13 chloroalkanes (No. 7), DEHP (No. 12), fluoranthene (No. 15), hexachlorobenzene (No. 16), hexachlorobutadiene (No. 17), hexachlorocyclohexane (No. 18), lead (No. 20), mercury (No. 21), pentachlorobenzene (No. 26), polycyclic aromatic hydrocarbons (No. 28) and tributyl tin cation (No. 30).

3 Risk assessment: Achievement of objectives by 2021

3.1 Risk assessment methods

On the basis of the pressures identified and their impacts, and also having regard to future developments, it is necessary to examine whether the objectives will probably be achieved in 2021 without any further measures in the second management planning period. The measures from the 2009 management plan that have been implemented up to 2015 are to be taken into account (assessment of achievement of objectives). The risk assessment is a significant part of the inventory and provides important information for drawing up the programme of measures for the second management planning period. The risk assessment supplements the status assessment, which reflects the current status, by looking ahead to the end of the next management cycle.

3.1.1 Surface waters

The risk assessment is based on the significant pressures, the provisional findings relating to ecological status or ecological potential and chemical status, and the impact of the measures from the first management period (cf. Fig. 6). The method used in Lower Saxony follows the LAWA working aid “Reviewing and updating the inventory under the Water Framework Directive by the end of 2013 – criteria for determining significant anthropogenic pressures in surface waters, evaluating their impacts and assessing the achievement of the relevant objectives by 2021” (LAWA 2013b)

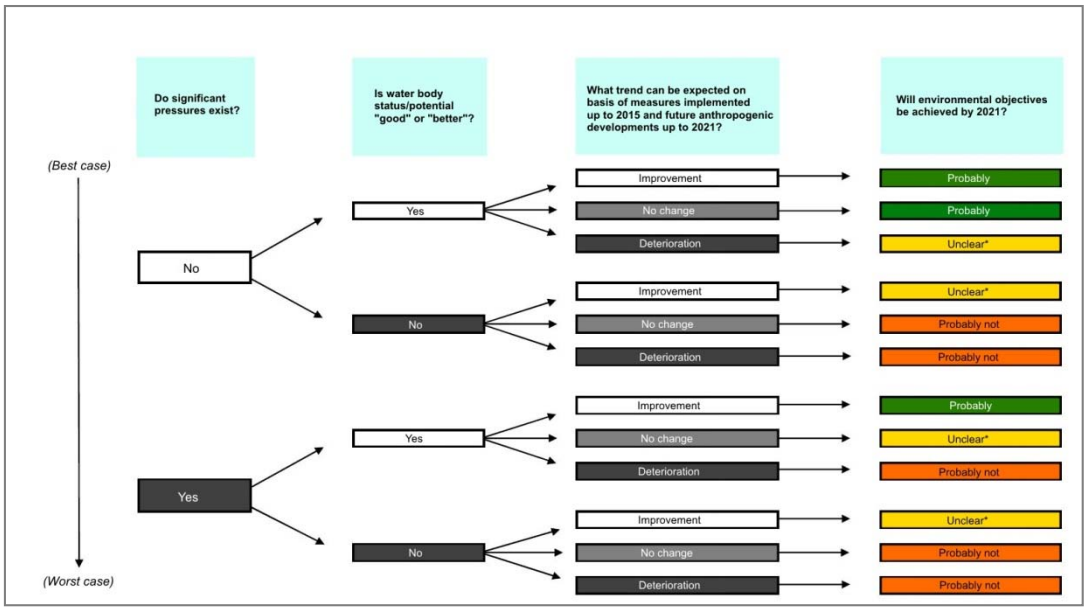


Fig. 6: Risk assessment procedure for surface waters (LAWA 2013b)

3.1.2 Findings for surface waters

Risk assessment for surface waters is based on evaluation of the monitoring data and the latest status assessments. The findings show that the majority of surface waters in Lower Saxony do not currently meet the objectives of the WFD (cf. Chapter 4.2.2). The number of measures planned or implemented in the first management period fell short of expectations. It must also be borne in mind that in many cases the impact of measures can only be measured after a certain time lag, and that in view of the size of the water bodies the effect of individual measures is obscured by the pressures. In addition to the structural deficits, there was an increasing shift of focus towards contamination of surface waters with nutrients in the course of the first management period. Anthropogenic influences on the nutrient situation in water bodies can reduce the impact of hydromorphological measures.
In the chemicals sector, no impacts of measures are to be expected by 2015, since diffuse inputs of pollutants can rarely be identified by means of water management measures. In the field of chemical assessment, the transposition of Directive 2008/105/EC into the Surface Waters Ordinance and the adoption of Directive 2013/39/EU in 2013 resulted in numerous changes in the group of substances to be investigated and the environmental quality standards in force. In the meantime the basis for assessment has been modified and made considerably more stringent. In particular, the tightening of the environmental quality standard for mercury in biota has resulted in the environmental quality standard being exceeded in all water bodies throughout the state (cf. Excursus IV in Chapter 4.2.3). It is once again necessary to bring the monitoring programmes into line with the changed requirements. It is therefore unlikely that good chemical status will be achieved in 2021.
All surface waters for which the latest results show that they do not possess good ecological status or potential and do not have good chemical status are unlikely to achieve the environmental objectives in 2021.

- For 1,529 surface water bodies the achievement of the “ecological” objectives in 2021 is classified as improbable. In the case of 40 surface waters it is unclear whether they will achieve the objectives.
- For 1,605 surface water bodies the achievement of the “chemical” objectives in 2021 is classified as improbable.

Since the assessment of achievement of the objectives is based on grouping the expectations for ecological and chemical environmental objectives according to the worst-case principle, the probability of achieving the objectives by 2021 is classified as unlikely for all surface waters.

3.1.3 Groundwater

According to Section 2 of the Groundwater Ordinance in conjunction with Annex 1, the requirements for description of the groundwater bodies include data on the nature and extent of relevant anthropogenic pressures and their impacts. The basis for updating the inventory is the LAWA working aid on the implementation of the Water Framework Directive, Part 3,

Chapter II.1.2 – Groundwater. The following figure illustrates the sequence of the individual risk assessment steps:

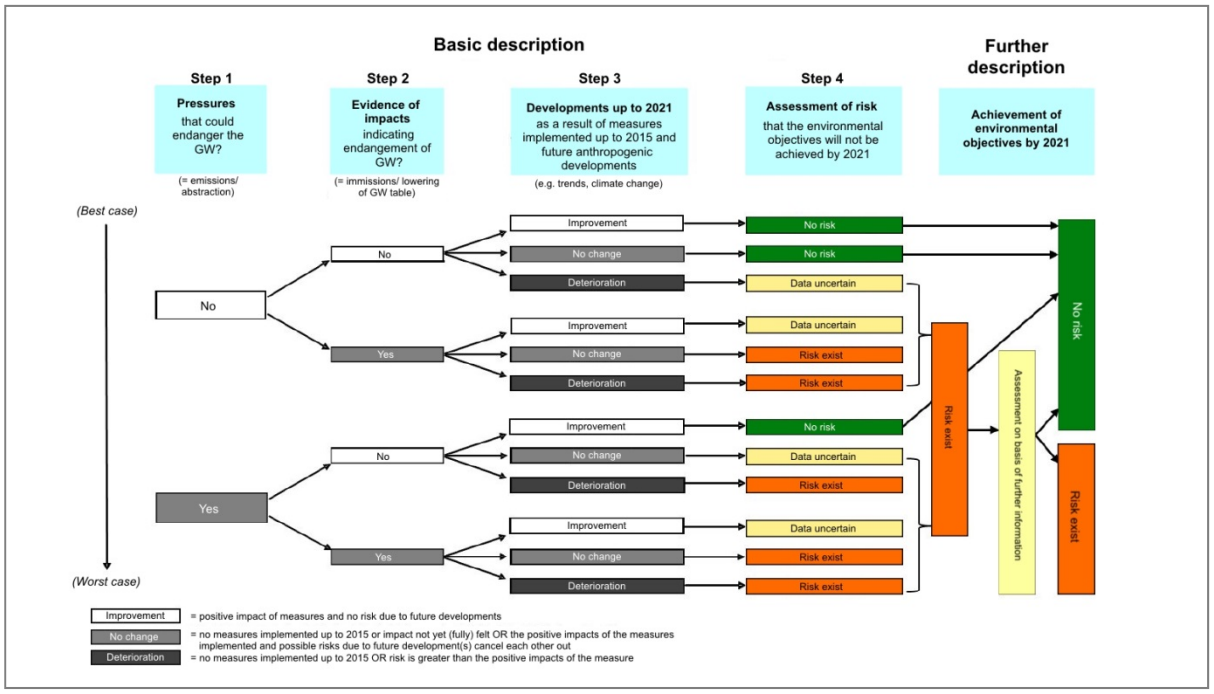


Fig. 7: Risk assessment procedure for groundwater bodies (LAWA 2013c)

In addition to the general descriptions, an examination of the future impacts on the groundwater body that are expected to result from present and planned water uses, measures, land use changes, and climate changes is also part of the risk assessment procedure. The number of agro-environmental measures implemented in the first management period fell short of technical expectations. It must also be borne in mind that, especially in the groundwater, it is necessary to take a long-term view of the impact of measures. The size of the groundwater body must also be taken into account.

3.1.3.1 Groundwater quality

In the context of risk assessment it is necessary to estimate whether there is a risk that an individual water body will fail to satisfy the criteria laid down in Section 5 of the Groundwater Ordinance by the end of the next management planning period in 2021. The risk assessment supplements the status assessment pursuant to Section 7 of the Groundwater Ordinance for the year 2015 by looking ahead to the end of the next management cycle (here: second management plan to 2021).
The risk assessment distinguishes between diffuse and point source pollution. Having regard to the emission and impact situation with a view to ensuring and confirming the results, a groundwater body is classified as:

- definitely endangered (risk exists), if its immission values exceed 75% of the threshold value or its emission load exceeds 20% of the area of the groundwater body.

- definitely not endangered (no risk), if its emission load is less than 20% of the area of the groundwater body and its immission values are less than 75% of the threshold value.

In Lower Saxony, assessment is based on defined sub-units of a groundwater body. If no poor groundwater quality studies are available, the sub-unit is assessed as “endangered” or “unclear” on the basis of the emission results. If adequate groundwater quality studies exist, assessment is based on the immission findings. If threshold values are exceeded at three or more measuring stations, the results of the emission studies for the sub-unit are checked. A further item of information recorded is the trends indicating a significant increase in the parameter nitrate (mean > 10 mg/l). Using this procedure, the sub-units can be classified in the risk groups “endangered”, “not endangered” or “unclear”. Finally, the assessment of the groundwater body emerges from the assessment of the individual sub-units. The point sources of pollution are listed together with details of the relevant pollutants and the pollutant plume and assigned to the appropriate groundwater bodies. There was no need for any further description, because the contaminated sites included in the list did not constitute a risk to the relevant groundwater bodies.

3.1.3.2 Groundwater quantity

The risk assessment with regard to the objective of achieving good quantitative status in 2021 which has to be performed as part of the inventory is conducted on similar lines to the assessment of quantitative status for groundwater bodies. Here is is necessary to pay special attention to the assessment criteria under Section 4 of the Groundwater Ordinance. The method is explained in more detail in the “Guide to assessing the quantitative status of groundwater bodies in Lower Saxony and Bremen under the Water Framework Directive (WFD)” (NLWKN 2013b). The risk assessment regarding quantitative groundwater status relates in each case to the entire groundwater body.
Achievement of the objectives in 2021 for groundwater quantity is not at risk if

- the development of groundwater levels or spring discharges shows that the long-term mean annual groundwater abstraction does not exceed the available groundwater resource, and
- changes in groundwater levels due to human activities will not in future result in
  - ⇨ failure to achieve the management objectives pursuant to Sections 27 and 44 of the Federal Water Act for surface waters with hydraulic connections to the groundwater body,
  - ⇨ significant deterioration of the status of such surface water bodies within the meaning of Section 3 No. 8 of the Federal Water Act,
  - ⇨ significant damage to terrestrial ecosystems that are directly dependent on the groundwater body, and
  - ⇨ adverse changes taking place in the groundwater due to inflows of saltwater or other pollutants as a result of changes of a limited temporal and spatial nature in the direction of groundwater flow.

When assessing the achievement of quantitative status in 2021 the above-mentioned individual criteria must be taken into account. According to the decree dated 25.03.2014 - Ref23-62170/06-0006- by the Lower Saxony Ministry of the Environment, Energy and Climate Protection, achievement of the quantitative objective for a groundwater body is at risk if

- an anthropogenic change in the groundwater level is identified or
- at least one protection objective listed in Section 4 (2) of the Groundwater Ordinance is not achieved.

Only if all criteria are satisfied is there no risk regarding achievement of the environmental objectives in 2021 for the purpose of the inventory pursuant to the WFD.
Consideration of groundwater-dependent terrestrial ecosystems is on the basis of the LAWA action recommendations for taking account of groundwater-dependent terrestrial ecosystems in the risk analysis and status assessment of groundwater bodies (cf. Chapter 11, LAWA 2012b). A total of 273 groundwater-dependent terrestrial ecosystems were found to exist in Lower Saxony. These areas were subjected to detailed examinations which included not only nature conservation findings, but also water management findings. Determination of the regional context for important groundwater-dependent terrestrial ecosystems is based on the "Concept for taking account of terrestrial ecosystems directly dependent on groundwater in the implementation of the WFD" (NLWKN 2013c).
The effects on the surface waters were determined by examining whether discharge into surface waters can be adversely affected by changes in the groundwater level or anthropogenic groundwater abstraction.

3.1.4 Findings for groundwater

3.1.4.1 Quality

The risk assessment in Lower Saxony's groundwater bodies revealed conspicuous findings for the parameters nitrate, crop protection agent active ingredients and non-relevant metabolites and cadmium, whereas no significant conspicuous findings were identified for ammonium, arsenic, lead, chloride, mercury and sulphate, having regard to geogenic background levels.

Nitrate

The groundwater quality risk analysis for nitrate showed that 53 groundwater bodies had to be classified as "endangered", 36 as "not endangered" and one as "unclear". The main reason for nitrate contamination in the groundwater was agricultural land uses and the associated nitrate surpluses from farmyard manure and mineral fertilisers.
No significant risk arising from the parameter nitrate was found in 36 groundwater bodies. The majority of these groundwater bodies were located in southern Lower Saxony (solid rock regions) and in the coastal marshlands. For one groundwater body the risk was assessed as "unclear". This was the groundwater body "Middle Weser, solid rock, left", where increasing

emissions and the lack of adequate numbers of measuring stations made a clear forecast impossible.

Crop protection agents

Crop protection agents are chemical or biological active ingredients and preparations that protect plants and plant products from harmful organisms (fungicides and insecticides) and undesirable competing plants (herbicides) or act on plants in some other way.
Eight groundwater bodies were classified as “endangered” as a result of imports of active ingredients from crop protection agents. Some 32 bodies were “not endangered”, and 50 bodies had to be classified as “unclear” because of inadequate data and lack of a basis for assessing findings of “non-relevant metabolites”.

Cadmium

According to the 2013 risk assessment, four groundwater bodies had to be assessed as “endangered” because of conspicuous cadmium concentrations. All the remaining 86 groundwater bodies are classified as “not endangered”. In addition to phosphate fertilisers containing cadmium, possible sources include inputs from the atmosphere or natural release of carbonate minerals. Furthermore, cadmium is frequently found in groundwater where the buffer capacity of the underlying soils or strata is low, because the mobility of cadmium rises sharply with falling pH.

3.1.4.2 Quantity

The two groundwater bodies “Leine, unconsolidated rock, left” and “Wietze-Fuhse, unconsolidated rock” contain surface waters that are regarded as a potential risk to achievement of the objectives as a result of changed discharges resulting from groundwater abstraction:

Table 20: Groundwater bodies with potentially endangered surface waters

GWB Leine unconsolidated rock, left	GWB Wietze-Fuhse, unconsolidated rock
Schleifbach	Wietze
Stockbach	Wuhlbeek
Kirchdorfer Mühlbach	Seebecke

In view of the potential risk to achievement of the objectives for the surface waters mentioned above, further studies of a more detailed nature were performed. These found that one cannot rule out the possibility that groundwater abstraction in the catchment area of the surface water body could reduce the groundwater-dominated discharge of these surface waters.
For the two water bodies Wietze and Wuhlbeek in particular, it was possible to construct such relationships on the basis of gauge data analysis. It is nevertheless possible that other factors such as water body development, discharges from sewage plants etc. might influence

individual water bodies or their discharges. However, in view of lack of data in individual cases it was not possible to reach any final conclusions on these water bodies. Furthermore, there is currently a lack of criteria or rules for defining when groundwater abstraction is significant with regard to achievement of objectives for a surface water body. Both groundwater bodies were therefore classified as “unclear” with regard to achieving the objectives.

For the two groundwater bodies “Leda-Jümme, unconsolidated rock, left” and the Lower Saxony part of the transboundary groundwater body “Große Aa”, a detailed study was performed in view of a conspicuous cluster of groundwater measuring stations with sharply falling trends. This detailed study included further analyses of the development of groundwater levels, the climatic situation and the pressure due to groundwater abstraction. Relevant environmental goods such as groundwater-dependent terrestrial ecosystems or surface waters are not affected in either of the two groundwater bodies.

As a result, achievement of the objectives in 2021 for the groundwater body “Leda-Jümme, unconsolidated rock, left” was classified as unclear. After consultation with North Rhine Westphalia, achievement of the objectives for the groundwater body “Große Aa” was classified as “endangered” in view of the data from the neighbouring state on the criterion “quantity”.

Conclusions

With regard to the objective of achieving good qualitative and quantitative status by 2021, the picture that emerges of Lower Saxony’s groundwater bodies is as follows:

- For 55 groundwater bodies the achievement of the qualitative objective in 2021 is classified as “endangered”, and for 20 groundwater bodies as “unclear”.
- The achievement of the quantitative objective by 2021 is classified as “endangered” for the groundwater body “Große Aa”, and as “unclear” for the groundwater bodies “Leine, unconsolidated rock, left”, “Wietze-Fuhse, unconsolidated rock” and “Leda-Jümme, unconsolidated rock”.

Since the assessment of achievement of the objectives is based on grouping the expectations for chemical and quantitative environmental objectives according to the worst-case principle, the probability of achieving the objectives by 2021 is classified as “endangered” for 55 groundwater bodies.

4 Monitoring and status assessment of water bodies and protected areas

4.1 Monitoring

For the purpose of monitoring water bodies (surface waters, groundwater) and protected areas, Article 8 of the WFD requires programmes to be drawn up for the establishment of a measuring station network in line with the requirements of the WFD to permit a coherent and comprehensive overview of water body status. Monitoring is thus a foundation for planning measures and controlling their progress (cf. EU Commission 2004c). Determining ecological status/potential and chemical and quantitative status involves measuring a large number of biological, chemical, physico-chemical, hydromorphological and quantitative parameters.
The basis for drawing up monitoring programmes is the LAWA framework concept for preparing monitoring programmes and assessing the status of surface waters (RaKon), Part A[40]:

- Framework concept for preparing monitoring programmes and assessing the status of groundwater bodies – Key points.
- Framework concept for preparing monitoring programmes and assessing the status of surface water bodies – Part A: Key points for monitoring and assessment of surface waters.
- Basic information on preparing monitoring programmes and assessing the status of surface water bodies.

The monitoring programme for Lower Saxony was prepared in accordance with Article 8 of the WFD on 22.12.2006 and communicated to the European Commission (cf. Chapter 11). Further information can be found in the river basin monitoring programmes pursuant to Article 8 of the WFD. The monitoring programmes are not rigid and are reviewed at regular intervals. Changes are notified to the European Commission via the management plans.

4.2 Monitoring and status/potential of surface waters

4.2.1 Monitoring of surface waters

The development of the existing quality monitoring network (GÜN) in Lower Saxony for measuring the ecological and chemical status of the water bodies in accordance with the WFD envisages three key areas:

[40] http://www.wasserblick.net/servlet/is/142681/

- surveillance monitoring,
- operational monitoring, and
- investigative monitoring.

The three types of monitoring pursue different objectives, which call for suitably coordinated monitoring parameters, measuring stations and frequencies. The measuring network concept is reviewed at regular intervals and – if necessary – optimised and adjusted. The most recent modifications were made during the preparation of the Surface Waters Ordinance, which transposed the provisions of the Environmental Quality Standards Directive (2008/105/EC). There will be further changes in the concept during the forthcoming transposition of the Directive amending the Environmental Quality Standards Directive (2013/39/EU).

Table 21: Number of measuring stations on rivers and lakes in Lower Saxony

Water body category	Number of measuring stations for surveillance monitoring	Number of measuring stations for operational monitoring in rivers only (1st/2nd order measuring stations)
Flowing waters	36	1,756
Standing waters	1	36

Measuring stations for investigative purposes are designated in surface waters on a site-specific and situation-specific basis. An overview of the measuring network concept can be found in the “GÜN quality measurement network for flowing waters and standing waters” (NLWKN 2012a)
Table 22 lists the current number of measuring stations in transitional and coastal waters for the individual quality elements and monitoring types. The measuring concept is not rigid. The ongoing process of European coordination of assessment methods (intercalibration) may also result in adjustments to the measuring concept in the future. Furthermore, the requirements of the Marine Strategy Framework Directive (MSFD) will have to be taken into account in the further development of the monitoring programmes. Further information and maps on the monitoring programmes in coastal regions can be found in “GÜN quality measurement network for transitional and coastal waters 2013” (NLWKN 2013d).

Table 22: Measuring stations in transitional and coastal waters

Quality element	Number of measuring stations* for surveillance monitoring	Number of measuring stations for operational monitoring
Phytoplankton	5	3
Macroalgae*	6*	–
Macrophytes* (Angiosperms)	8*	–
Benthic invertebrates	13	15
Fish fauna	6	–
Chemicals (Water)	10	21
Chemicals (Sediment)	15	1
Chemicals (Biota)	10	–

*The “measuring stations” for macroalgae and macrophytes are representative virtual points at a central location in the individual water body (info points). These are assigned the results from largely area-based measurements.

4.2.2 Ecological status and potential of surface waters

The results of the inventory and monitoring processes form the basis for subsequent assessment of the water bodies at the end of the first management period.
The surface water bodies are assessed primarily on the basis of their biocenoses, and their ecological status is determined. As a basis for assessment of the individual types, a description of high status was developed, having regard to all ecologically relevant influences, the reference status and/or the reference water body. The reference conditions were laid down on the basis of the recommendations in the “Guide to determining reference conditions and defining thresholds between ecological status categories for inland surface waters (REFCOND)” by CIS working group 2.3 (EU Commission 2004d). The objective formulated in the guide is for good ecological status. In simple terms, this is achieved if:

- the composition and abundance of the quality elements considered show only slight deviations from the type-specific communities,
- the proportion of disturbance-sensitive species shows only a gradual deviation compared with the robust species,
- the degree of species diversity also shows no more than a slight deviation.

To support the biological consideration of water bodies, it is also necessary to determine and assess hydromorphological criteria, such as continuity and general physico-chemical parameters (Annex VIII WFD, 10-12), and specific synthetic and non-synthetic pollutants (Annex VIII WFD, 1-9). The specific synthetic and non-synthetic pollutants are included in the Surface Waters Ordinance as “river basin specific pollutants” (Annex 3, No. 3.1 and Annex 5 to the Surface Waters Ordinance). The lists of substances include industrial chemicals, crop

protection agents, heavy metals and other substances that do not belong to the above-mentioned categories.
In addition to ecological status, it is necessary to determine and assess the chemical status of the surface waters. A distinction is made between “good” chemical status and “not good” chemical status. The starting point for chemical assessment is currently the requirements of the Surface Waters Ordinance, Annex 7, in conjunction with the Directive amending the environmental quality standards (2013/39/EU).

The basis for this work is the LAWA framework concept for preparing monitoring programmes and assessing the status of surface waters (RaKon):
Part A: Key points for monitoring and assessment of surface waters[41]
Part B: Assessment basis and description of methods[42]

- Working paper I: Water body types and reference conditions
- Working paper II: Background and guide values for physical-chemical quality elements to support the assessment of water bodies in accordance with the WFD
- Working paper III: Methods for investigating biological quality elements
- Working paper IV.1: Methods for investigating chemical and physical chemical quality elements – Annex 3: Analytical methods for biota studies
- Working paper IV.2: Recommendation on long-term trend determination in accordance with the Ordinance for the protection of surface waters
- Working paper IV.3: Recommendation for investigation of sediments and suspended solids at surveillance monitoring stations pursuant to the Ordinance for the protection of surface waters
- Working paper VI: Determination of good ecological potential – Flowing waters

The working papers were to some extent updated as part of the LAWA work programme for the second management period.
During the first management period, the assessment methods developed for the individual biological quality elements underwent further optimisation. The development of individual methods, e.g. for marshland waters, has yet to be completed. The intercalibration of methods between the member states is not yet complete either:

[41] http://www.wasserblick.net/servlet/is/142681/
[42] http://www.wasserblick.net/servlet/is/142684/

Excursus III: Intercalibration (LAWA, 2013)

Section 1.4.1 of Annex V to Directive 2000/60/EC provides a process to ensure the comparability of biological monitoring results between Member States, being a central part of the ecological status classification. This requires the results of the Member States' biological monitoring and classification under the monitoring systems to be compared through an intercalibration network comprised of monitoring sites in each Member State and in each eco-region of the European Union[43].

Intercalibration is to be performed at the level of biological quality elements (BQE) and their individual parameters, by comparing the classification results of the national monitoring systems for each element and for each common surface water body type between the member states in the same geographical intercalibration group (GiG) and assessing the agreement of the results with the normative definitions in Annex V No. 1.2 of Directive 2000/60/EC.

The first intercalibration phase dealt with the method for phytoplankton in lakes. The methods for benthic invertebrates in rivers and makrophytes/phytobenthos in rivers and lakes were intercalibrated to a certain extent. In the case of coastal waters, all relevant elements were intercalibrated to a certain extent. The intercalibration process was based on CIS Guidance Document No. 14 "Intercalibration 2004-2006" (2005)[44]. The results were laid down in the Commission decision of 30 October 2008 on the assessment and monitoring of biological quality elements (2008/915/EC)[45].

To fill existing gaps in the first decision, the second decision repealed and replaced the first. This decision supplements or updates the intercalibration results of the first phase and adapts them to the requirements of the revised CIS guidance document (CIS Guidance Dokument No. 14 "Intercalibration 2008-2011" (2011)[46]. The second decision consists of an instruction part with recitals, and two annexes. The first annex contains results which are regarded as completely intercalibrated, so here too it is still possible to update them in the light of new findings. The second annex contains provisional results that require further work, but are already being used as a basis for preparing the second management plans. All assessment procedures that are not fully intercalibrated (listed in Annex II) are to be completed during the continued intercalibration work in the third phase ending on 22.12.2016.

Any work on remaining gaps in the assessment methods that has not been started up to this point must be included and completed. The possibility should be investigated of transferring the results for natural waters to heavily modified water bodies. Deficits continue to exist in Germany, mainly in the field of the coastal and transitional waters of the North Sea, and also for the group of "very large rivers" in the flowing waters sector. Here only the BQE "Phytobenthos" has been successfully intercalibrated so far.

[43] EU-CIS Guidance Document No. 6 "Intercalibration" (2004): http://tinyurl.com/CIS-DG-6-pdf
[44] http://tinyurl.com/CIS-GD-14a-pdf
[45] http://tinyurl.com/Ent-KOM-IC-2008-pdf
[46] http://tinyurl.com/CIS-GD-14b-pdf

Table 1: Overview of results of the second intercalibration phase that included procedures and types in geographical intercalibration groups (GiG) with German participation (grouped by quality elements and water body categories)

	Flowing waters	Very large rivers	Lakes	Transitional waters	Coastal waters
Phytoplankton	n. r.			n. r.*	
Macrophytes / phytobenthos				n. r.	n. r.
Macroalgae and angiosperms	n. r.	n. r.	n. r.		
Benthic invertebrate fauna					
Fish fauna					n. r.

Complete (intercalibration was successfully completed. The German assessment procedures are shown in Annex I to the new intercalibration decision)

Partial (intercalibration was successfully completed in part. A large proportion of the German assessment procedures are listed in Annex I to the new intercalibration decision and/or some of the German assessment procedures are listed in Annex II to the new intercalibration decision and/or in the case of some German assessment procedures work on intercalibration has not yet started)

Open (intercalibration has started but could not be completed, or intercalibration has not yet started)

n. r. = not required under WFD
n. r.* = not assessed in DE, reasons accepted by COM

A large proportion of the results of the second intercalibration phase have already been included in the course of adaptations and revisions to the national assessment systems. This may result in situations where the effects originally expected of the measures are partly offset by stricter assessment as a result of more stringent requirements. In the case of the elements and parameters that are still open, the national assessment procedures will continue to be used for status description. This involves an uncertainty factor, because changes in the class limits or assessment criteria are still possible during the process of updating intercalibration, and this would have additional impacts on the assessment of the monitoring results.

It is not out of the question that the assessments made might still be altered, even after presentation of the second management plan.

Designation of heavily modified and artificial water bodies

The WFD opens up the possibility of designating artificial or heavily modified water bodies in addition to natural water bodies (NWB). According to the definition in Section 3 No. 4 of the Federal Water Act or Article 2 No. 8 of the WFD, an artificial water body means a body of surface water created by human activity. Examples include canals, reservoirs, or marshland drainage channels that have been dug in the course of centuries and have no upper reaches in the geest country. According to Section 3 No. 5 of the Federal Water Act, heavily modified water bodies (HMWB) comprise surface water bodies whose nature has been heavily modified as a result of physical changes due to human activity (Article 2 No. 9 WFD). A surface water body may be classified as heavily modified if the implementation of measures to achieve the objective of good ecological status involves significant adverse effects on existing uses, e.g. flood control, land drainage, urbanisation or shipping.

“Unlike natural water bodies, good ecological potential is regarded as the management objective for heavily modified or artificial surface waters. This management objective is so defined that it can be achieved without any significant deterioration in the uses specified in Section 28 of the Federal Water Act or without damaging the environment in a wider sense. HMWBs and AWBs that fail to achieve this management objective must be managed by taking appropriate measures that will permit the achievement of good ecological potential. In the case of heavily modified and artificial water bodies, deviations from the natural state are only permitted for the quality element “hydromorphology”, provided this is due to one of the specified uses and is unavoidable as a result of an otherwise significant deterioration in the specified use. Such morphological degradation can also bring about biological changes,” (LAWA 2013d, p. 2).

On the basis of the 2009 management plan and the differences that this shows within Germany, the designation of HMWBs within Germany was reviewed by LAWA: The North-South distribution of HMWBs shows a correlation with the natural regions of Germany. For example, considerably more water bodies are designated as HMWBs in the lowlands and river plains than in the central uplands and the Alps. On the North German plain, the development of water bodies reflects their use for drainage and landscape purposes (LAWA 2012c, p. 26).
Section 28 of the Federal Water Act or Article 4 (3) of the WFD lays down several steps for investigating the classification of a water body as artificial or heavily modified. These steps are defined in greater detail in the CIS Guidance Document on identifying and designating heavily modified and artificial water bodies (EU Commission 2004e). The classification and designation of heavily modified or artificial water bodies is reviewed every six years. This makes it possible to take account of ecological, social and economic changes.

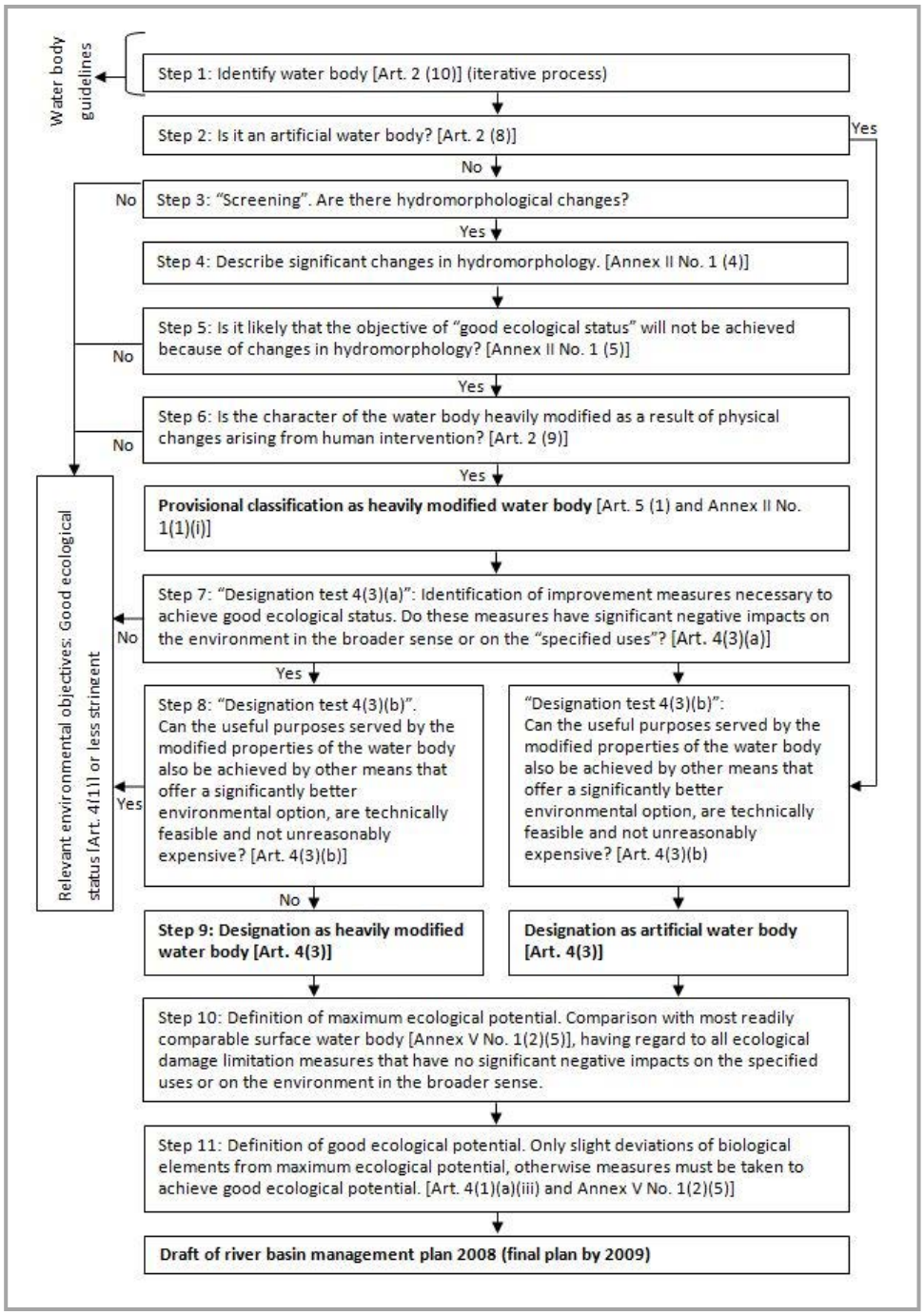


Fig. 8: Designation of heavily modified and artificial water bodies and determination of ecological potential (CIS WORKING GROUP 2.2, 2002, cf. LAWA 2013d).

For the review of the inventory pursuant to Section 3 of the Surface Waters Ordinance and Article 5 of the WFD, the procedure for designating heavily modified water bodies was further harmonised between the federal states. The basis for the updating process was the recommendation on designating HMWBs/AWBs in the second management plan in Germany (LAWA 2013d), which provides a more detailed description of the various steps in the CIS Guidance Document. In 2013 the status of all water bodies in Lower Saxony was reviewed in accordance with the scheme shown in Fig. 8.

An important step in designation is step four: the description of the significant changes in hydromorphology (cf. Fig. 9).

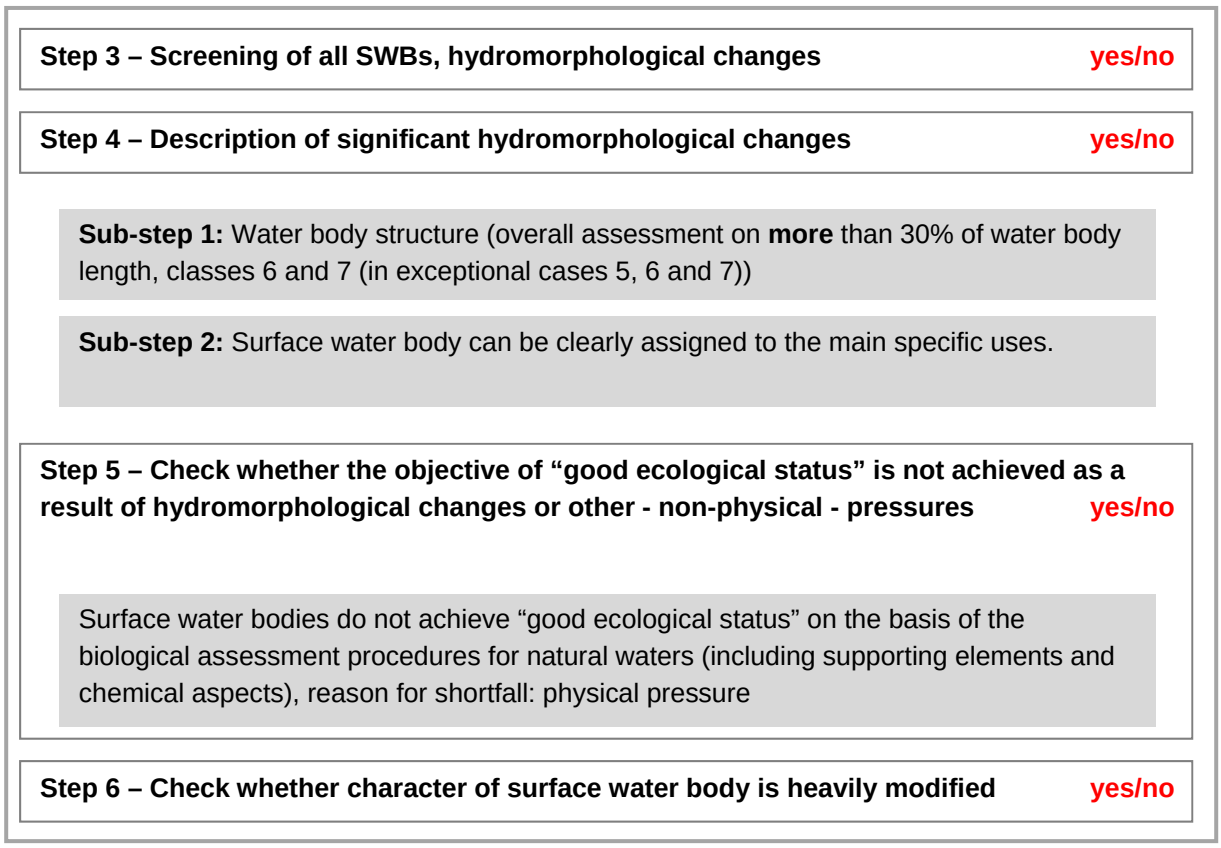


Fig. 9: Overview of the criteria for and selection of HMWBs in steps 3 to 6 of CIS Guidance Document No.4. (amended after LAWA, 2013d)

Sub-step 4.1 examines the structure of a water body. Hydromorphological changes can be deduced from the structural maps of water bodies. If more than 30% of a water body belongs to the structural classes five, six and seven, these changes are the result of anthropogenic interference, e.g. in alignment, in the bed substrate or the vicinity of the water body, and it may be assumed that the water body in question is heavily modified.

Sub-step 4.2 then examines which important specific uses are responsible for the hydromorphological changes. In the interests of a standardised procedure, the recommendation on the designation of HMWBs/AWBs in the second management plan in Germany for updating water body status 2013 sets out criteria for the assignment of uses (LAWA 2013d). The use "shipping", for example, is to be used exclusively for water bodies that are federal waterways.

If the biological quality elements also show that good ecological status cannot be achieved (Step 5) because of the hydromorphological pressures described in Step 4, the water body is to be classified as heavily modified (Step 6) and the further steps in designation are to be checked. An important criterion in the further course of the procedure is the uses made of a water body and the question of whether these functions counteracting the achievement of the objectives can be performed in some other way. If this could only be done at unreasonably high cost or effort or would not be feasible from a technical point of view, this argument forms

the basis for classification as a heavily modified surface water body. In Lower Saxony, all working steps in the review of water body status are documented separately for each water body.

The question of designating artificial and heavily modified surface waters has been the subject of intensive discussion in a state dominated by cultural landscapes such as Lower Saxony, including in the context of updating in the regional cooperation alliances. In Lower Saxony there has been a slight increase in the number of natural water bodies in the rivers and lakes sectors, whereas the number of water bodies classified as heavily modified shows a reduction. The review of the status of the transitional and coastal water bodies confines the designation of the transitional waters as heavily modified water bodies, and also the retention of natural status for coastal waters. Table 23 and Map 1 show the current classification of the water bodies in Lower Saxony.

Table 23: Status of surface water bodies (SWBs) in Lower Saxony[47]

Water body category	Total number of SWBs	of which NWBs	of which HMWBs	of which AWBs
Flowing waters	1,562	358	878	326
Standing waters	27	11	8	8
Transitional waters	3	-	3	-
Coastal waters	13	13	-	-
Total SWBs	**1,605**	**382**	**889**	**334**

Approximately 55% of the water bodies in the whole of Lower Saxony are designated as heavily modified surface waters. The remaining surface waters are designated in almost equal quantities as natural water bodies (around 24%) and artificial water bodies (around 21%). As rivers account for the largest share of water body categories in terms of numbers, the picture in this segment is similar. 56% of rivers are designated as heavily modified, 23% as natural and 21% as artificial.

Table 96 in Appendix A-4 shows the status in 2008 and the current status for each water body. A list of the water bodies in the Lower Saxony parts of the river basins is shown in Appendix A-3.

The uses set out in sub-step 4.2 are defined as “grounds for designation” for each water body. The standardised rules for the specified uses made it necessary to redefine the grounds for designation. In the designation process, surface waters in Lower Saxony were classified as heavily modified for a variety of reasons (cf. Table 24).

[47] The table lists all water bodies notified to the European commission by Lower Saxony.

Table 24: Grounds for designation of surface water bodies[47] as heavily modified (multiple grounds can be stated)

Grounds for designation of surface water bodies as heavily modified	Total number	of which: flowing waters	of which: standing waters	of which: transitional waters
Land drainage and flood control (e20)	833	833	-	-
Artificial impounding structures (e21)	7	7	-	-
Urbanisation (e22)	54	54	-	-
Flood control (e23)	64	53	8	3
Shipping (e24)	25	22	-	3
Hydro power (e26)	12	6	6	-
Water supply/drinking water storage (e27)	5	-	5	-
Leisure and recreation (e28)	6	5	1	-
Environment in the broader sense (e29)	2	2	-	-
Reservoirs (e30)	10	5	5	-

In Lower Saxony as a whole, the exclusive or supplementary reasons given for designating about 94% of the surface waters as heavily modified were land drainage and flood control. Far less frequent grounds for classification were urbanisation (5%) or flood control (6%). Table 96 lists the grounds for classification for every water body designated as a heavily modified water body.

4.2.2.1 Flowing waters and standing waters

The ecological status of a water body was assessed on the basis of a five-point scale: high, good, moderate, poor and bad. A four-point scale was used for ecological potential: good and better, moderate, poor and bad. Chemical status is assessed on a two-point scale as good or not good.

The final assessment of all rivers and lakes was made as of 01.08.2014. Assessment was based on the monitoring data for the years 2009 to 2013.

Flowing waters

<u>Ecological status/potential</u>

Table 25 and Map 2 show the status and potential situation for the flowing water bodies in Lower Saxony. Assessment is based on the result for the least favourable element (worst-

case principle). The quality element benthic invertebrates reacts to structural pressures and to pressures resulting from oxygen-depleting organic substances. For this reason, the modules “degradation” and “saprobity” are used to assess these quality elements. The influence of morphological degradation on assessment becomes evident when using the module “degradation” to examine the assessment of benthic invertebrates: the majority of water bodies fail to achieve the objectives of the WFD (cf. Map 3). Compared with the saprobity index used until the year 2000, the “saprobity” module is modified on a type-specific basis and adapted to the flowing water types in the WFD. Furthermore, the seven-stage system is implemented using the five stages of the WFD. 43% of the water bodies were classified in Class 2, and a further 43% in Class 3. The results of these partial analyses are shown in Map 4.
The hydromorphological and general physico-chemical quality elements are used in a supporting role when assessing the biological quality elements. The hydromorphological quality elements include water balance, continuity and morphology. A method is currently being developed for assessing the water balance. The results will be available for the 2021 management plan. To assess the continuity of the water bodies, an analysis is made of the transverse structures on the basis of structure type and drop height. Only about 10% of the roughly 7000 transverse structures registered are continuous (Bioconsult 2014a). In all water bodies that do not currently possess good ecological status, the morphology is classified as not good. More detailed results can be found in the analysis of the detailed structural maps (cf. Chapter 2.2.1). Temperature conditions, oxygen concentration, salt concentration and other parameters are among the general physico-chemical quality elements that provide information about water quality. They supplement and support the interpretation of the results for the biological quality elements. If the values are not complied with, this is a valuable indication of possible pressures and deficits with ecological effects.

To permit a comparative description of the reliability of the biological results across Europe, a three-stage “confidence level” was introduced. In Lower Saxony, all results from the assessment of flowing waters were classified at a high confidence level, since the assessment had been made using methods that were WFD-compliant and recognised by LAWA.

The biggest changes in the ecological assessment resulted from the development and use of a standardised nationwide procedure for assessing HMWBs and AWBs: Harmonisation of the identification of “good ecological potential” (LAWA 2012d). Part of the recommendation is the “Manual for assessment and planning of heavily modified water bodies (HMWBs) and artificial water bodies (AWBs)”. Basic information on determining good ecological potential can also be found in RaKon working paper VI.

As a management objective for heavily modified (HMWB) and artificial (AWB) water bodies, the WFD calls for the achievement of “good ecological potential” (cf. Section 27 of the Federal Water Act). “The highest ecological potential is defined by the implementation of all technically feasible measures for ecological upgrading of a water body without significant negative impacts on the specified uses or on the environment in the broader sense (in

accordance with Article 4 (3) of the WFD). Good ecological potential is the condition in which the values for the relevant biological quality elements show slight changes from the values found at maximum ecological potential. (WFD Annex V No. 1.2.5)" (LAWA 2012e).

Unlike natural water bodies, whose management objective is to be derived from the natural state, the management objective for heavily modified water bodies is derived from their uses, the possible hydromorphological measures and the resulting biological values. "Hydromorphological" measures concern the water balance, morphology and continuity of a water body.

When determining maximum or good ecological potential, the specified uses are taken into account in the form of individual uses or combinations of uses. The grounds for designation include all uses relevant to the water body. Where multiple uses are recorded for a water body, the dominant use is to be emphasised. Together with the water body type, the dominant use forms the basis for assessing the ecological potential.

The technically feasible measures identified from the dominant use are taken as a basis for defining habitat conditions in the highest ecological potential, which are made up of the subdivisions morphology, water balance and continuity. On the basis of these habitat conditions, biological references are laid down for the biological quality elements benthic invertebrates and fish. In combination with the water body type groups, the uses form the basis for the roughly 40 HMWB groups to which the great majority of heavily modified waters in Germany can be assigned and for which descriptions of maximum and good ecological potential were prepared in the form of profiles (cf. LAWA 2012e, p. 8).
In the case of Lower Saxony's rivers, it is possible to assign the water bodies directly to a case group. The next step is to apply the relevant assessment method for benthic invertebrates and fish. The result of the assessment procedure determines the degree of achievement of the ecological potential objective, and hence any resulting need for measures. Once good ecological potential is achieved – in other words all relevant biological quality elements reach the values for good ecological potential – there is no further need for hydromorphological measures. If good ecological potential is not achieved, hydromorphological measures are needed (cf. LAWA 2012e, p. 10).
Table 25 shows the latest assessment findings for Lower Saxony. Table 96 (Appendix A4) shows the latest assessment result for every flowing water body in Lower Saxony.
Overviews of the distribution by river basins can be found in Appendix A-3.

Table 25: Ecological status/potential – Flowing waters

Ecological status, number of NWBs						**Total number of flowing water NWBs**
High	Good	Moderate	Poor	Bad	No assessment possible	
–	19	154	136	45	4	358
Ecological potential – number of HMWBs						**Total number of flowing water HMWBs**
Good		Moderate	Poor	Bad	No assessment possible	
5		231	427	206	9	878
Ecological potential – number of AWBs						**Total number of flowing water AWBs**
Good		Moderate	Poor	Bad	No assessment possible	
-		39	129	131	27	326

In the case of 40 water bodies, assessment was not possible for technical reasons. Especially in cases of water bodies temporarily drying out, it is not possible to use the biological assessment methods. This also applies to the assessment of shipping canals.

Standing waters

Ecological status/potential

The assessment of lakes with a surface area of 0.5 square kilometres or more is based on the requirements of the Surface Waters Ordinance. This requires classification of ecological status in the case of natural lakes and ecological potential in the case of heavily modified and artificial lakes (cf. Fig. 10).

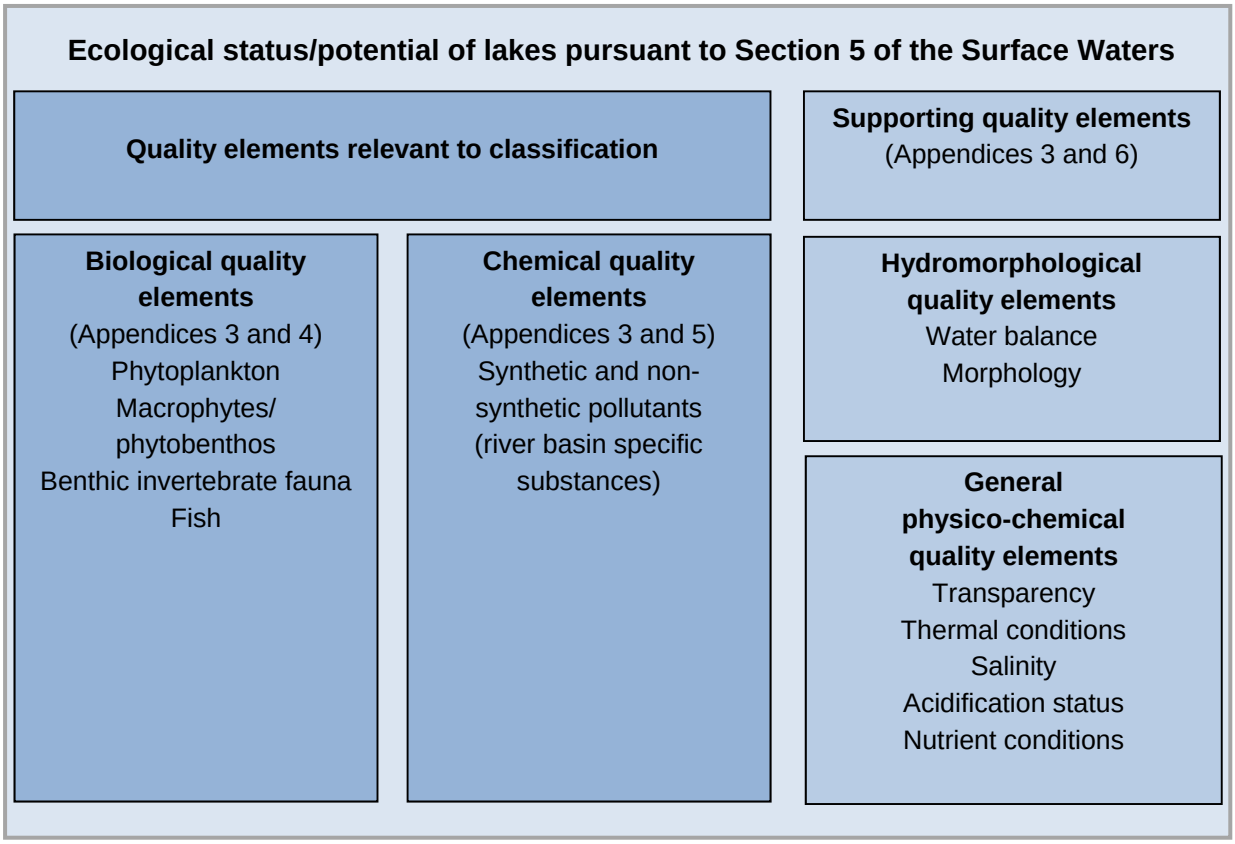


Fig. 10: The same quality elements are used for classifying ecological status and ecological potential (LAWA 2013e, p. 3, amended)

The quality elements used for assessing the ecological potential and ecological status of lakes are basically the same. The only differences lie in the reference conditions for the biological and supporting quality elements. The definition of the status of a lake unaffected by human disturbance, which according to the WFD is not to be made for the individual lake, but for specific types of lake, is hardly possible in the densely settled lowlands and central uplands. To determine a reference trophic state that is specific to a lake type, the results of the following preliminary classification approaches were evaluated and brought together in a standardised designation of the reference statuses of each lake type for phytoplankton assessment:

- Lake assessment according to LAWA (LAWA 1999) with designation of the target status by means of morphometric lake data (morphometric reference status).
- Paläolimnologische Studien (Mischke et al. 2003, Schönfelder 2004, van Geel et al. 1994, unpublished reports).
- Expert opinions of the representatives of the federal states.

As for flowing waters, the assessment methods for the biological quality elements phytoplankton and macrophytes/phytobenthos have since been expanded and calibrated for determining ecological potential. The indicator lists drawn up for natural water body types have been adapted for artificial and heavily modified water bodies (cf. LAWA 2013e). Only

natural lakes can be assessed with the quality element “fish”. There is currently no fish-based assessment method for artificial and heavily modified lakes.
Among the 27 WFD lakes in Lower Saxony there are eight artificial lakes, and a further eight lakes (seven reservoirs and Gartower See) count as heavily modified water bodies. The reservoirs are a relatively widespread special form consisting of impounded flowing waters in an existing water body system. In view of their use (e.g. drinking water supply, flood control and process water supply) they fail to achieve good ecological status in the flowing water assessment. These water bodies are provisionally identified as heavily modified. They are subsequently switched to the “lake” category, since they are closer to this category on the basis of their hydromorphological and limnological properties (Section 5 of the Surface Waters Ordinance). After further examination they are allowed to be designated as heavily modified water bodies (cf. Fig. 8). The above-mentioned designation criteria continue to apply to all reservoirs in Lower Saxony, which means they are listed as heavily modified water bodies.
Owing to the considerable hydromorphological changes in Gartower See in the course of dyke development, and in view of its tourism uses, HMWB status can also be confirmed for this lake.
Changes were made regarding the Hieve and the Zwischenahner Meer, which had hitherto been notified with HMWB status. Both lakes are of natural origin and can be classified as NWBs:

- the excavation of a pit more than 20 m deep in the Hieve in the 1970s affects less than 10% of the lake area and thus represents only a slight hydromorphological change, which in any case does not prevent the achievement of good ecological status.
- The grounds for designation of the Zwischenahner Meer as a heavily modified water body do not represent any significant change in the lake and can also be shown to exist for numerous lakes with NWB status in Lower Saxony and Germany. However, as with nearly all natural shallow lakes in Lower Saxony, the present bad status of the Zwischenahner Meer is largely determined by the diffuse nutrient pressures from the lake’s catchment area. This significant pressure, however, is not relevant for classification as a heavily modified water body.

Results of the assessment of ecological status or ecological potential are available for all 27 standing waters. The development of the biological assessment systems for outstanding waters is complete except for fine tuning of the method for the biological quality element “benthic invertebrates”. The intercalibration process for the assessment procedures within the European Commission has now been completed for all biological quality elements.
To permit a comparative description of the reliability of the biological results across Europe, a three-stage “confidence level” was introduced for the assessment of standing waters as well. In view of the completed development and use of the relevant assessment methods, all results for standing waters were adjudged to have a high confidence level.
The following table shows the results for standing waters in Lower Saxony.

Table 26: Ecological status/potential – Standing waters

Ecological status NWB				
High	Good	Moderate	Poor	Bad
-	1	2	4	4
Ecological potential HMWB				
Good		Moderate	Poor	Bad
6		1	1	-
Ecological potential AWB				
Good		Moderate	Poor	Bad
2		5	1	-

Since the excessive supply of nutrients and the resulting trophic state continue to be the main pressure on lakes in Lower Saxony, the biocenotic quality element “phytoplankton” in particular is suitable for use as a highly sensitive indicator of the ecological status of a water body. To ensure a high confidence level, the biological quality element “phytoplankton” was therefore used for all lakes in Lower Saxony. Depending on suitability and appropriateness it was supplemented by the biological quality elements “macrophytes/phytobenthos” and “fish”. Since the assessment procedure for “benthic invertebrates” was still under development, this newly developed method was used for the Dümmer as an example.
Expert knowledge is called for in the final assessment of ecological status or potential on the basis of the plausibilised findings for the most suitable biological quality elements in each case. Thus the assessment of the ecological status of a water body is not confined to a purely mathematical assessment on the basis of raw data.

4.2.2.2 Transitional and coastal waters

Ecological status/potential

The following tables summarise the results of water body assessment in Lower Saxony for transitional and coastal waters in the Ems and Weser River basins, including the coastal sea. They also take account of transboundary water bodies. Schleswig-Holstein is responsible for the transitional waters of the Elbe. This work is closely coordinated with Lower Saxony and Hamburg.
The coastal waters are designated as natural water bodies (NWB), for which ecological status and chemical status are documented. The ecological potential and chemical status are shown for the transitional waters, all of which are designated as heavily modified water bodies (HMWB). In Lower Saxony, the three water bodies of the coastal sea of the Ems and Weser extend offshore from the coastal waters to the 12 mile limit. For this type of water body (N0) only the chemical status is assessed, not the ecological status.

In all cases these water bodies are found to fall short of good ecological status or good ecological potential. For example, the quality element “phytoplankton” revealed measurements (chlorophyll) resulting in (sometimes clear) failure to achieve the objective of good ecological status. But the other quality elements do not achieve good status either (fish), or only in a few individual cases (benthic invertebrates and macrophytes).
Methods for assessing ecological status or ecological potential have been developed and tested for all quality elements (benthic invertebrates, macrophytes, phytoplankton, fish (in transitional waters only)) (monitoring sheets www.blmp-online.de, NLWKN 2010, Bioconsult 2014b). All assessment methods are WFD-compliant and recognised by LAWA. The confidence level of the assessments can therefore be described as “high”.
The assessment methods used have already been agreed (intercalibrated) at European level (quality element “phytoplankton” in coastal water N1/26, quality element “fish” in transitional water T1) or are currently in the course of the European coordination process (Phase 3 of intercalibration, due for completion at end of 2016, cf. Excursus III). The assessment of ecological status/potential for the water bodies in the Ems estuary was undertaken in bilateral coordination with the Netherlands.

Table 27: Ecological status/potential – Transitional and coastal waters

Ecological potential – Transitional waters			
Good	Moderate	Poor	Bad
-	2	1	-

Ecological status – Coastal waters				
High	Good	Moderate	Poor	Bad
-	-	3	7	-

The ecological potential of the Elbe transitional waters is classified as moderate.

4.2.3 Chemical status of surface waters

4.2.3.1 Chemical status of surface waters

On 12 August 2013 the European Parliament and the Council of the European Union adopted Directive 2013/39/EU amending the Water Framework Directive (2000/60/EC) and the Directive on environmental quality standards (2008/105/EG) as regards priority substances in the field of water policy. Under Article 3 of Directive 2013/39/EU, the member states must transpose this amending directive into national law by 14 September 2015. In Germany this is to be done by making appropriate changes to the Surface Waters Ordinance. The environmental quality standards (EQS) have been revised for seven substances that are already regulated.
These are:

- industrial pollutants: anthracene, brominated diphenylethers, naphthalene,

- heavy metals: lead and lead compounds, nickel and nickel compounds, and
- in the group of other pollutants: fluoranthene and other polycyclic aromatic hydrocarbons.

The new Article 3 (1a) i) in Directive 2008/105/EC provides for using these revised environmental quality standards from 22 December 2015 onwards with the aim of achieving these more ambitious objectives by 22 December 2021 by means of the new programmes of measures in the second management cycle. As a result of this new article in Directive 2008/105/EC the revised environmental quality standards for the above-mentioned substances or substance groups are already being used throughout Germany in the current process of assessing chemical status and drawing up the programmes of measures and management plans for the second WFD cycle. The specific changes for the seven substances/substance groups are shown in Appendix A-2. Complete transposition of Directive 2013/39/EU into the Surface Waters Ordinance and the adaptation of the Lower Saxony monitoring program will take place in the next few years.
Thus assessment of chemical status in Lower Saxony was performed on the basis of the provisions of the Surface Waters Ordinance of 2011 and, in the case of the seven substances/substance groups mentioned, on the basis of Directive 2013/39/EU. A detailed description of all substances is provided in the Guide to planning of measures for surface waters, Part C (NLWKN 2012b).
The transposition of the two directives results in a marked change in the assessment of chemical status of the water bodies compared with the chemical status in the first management plan dating from 2009 (NLWKN 2008). One significant change arises from the amended basis for assessment of mercury in biota. The environmental quality standards for mercury are found to be exceeded in all water bodies throughout Germany. As a result, the chemical status of all water bodies in Lower Saxony and the whole of Germany is currently “not good”.

Excursus IV: Environmental quality standard for mercury exceeded (LAWA, 2014)

Causes of pressure

Mercury is a metal, a characteristic feature of which is its great mobility in the environment. Metallic mercury has a half life of approximately one year in the atmosphere before it is oxidised and washed out. Mercury enters the environment from natural and anthropogenic sources. In view of its mobility, it is necessary to consider worldwide emissions. The following table provides a brief overview.

Table 1: Global mercury emissions 2008[48]

Global mercury emissions 2008		**Emissions [t/a]**
Natural sources and emissions	Emissions from the oceans	2,682
	Combustion of biomass	675
	Others	1,850
	Total	**5,207**
New emissions	Coal-fired power stations	810
	Gold production	400
	Non-ferrous metal processing	310
	Cement production	236
	Waste treatment/deposition	187
	Caustic soda production	163
	Others	214
	Total	**2,320**
Total		**7,527**

The worldwide increase in anthropogenic environmental inputs of mercury in recent decades, and especially in the last 15 years, is due to the increase in coal-fired power generation, particularly in Asia. In Europe, the combustion of coal is responsible for the main environmental input, which largely takes place via the atmosphere. Worldwide mercury emissions also result from cement production, iron and steel production, nonferrous metal production (Cu, Pb, Zn), extraction of mercury and gold, and waste incineration (e.g. municipal waste, sewage sludge)[49]. Direct inputs into water bodies, which in earlier years also gave rise to considerable loads in Germany, have since been largely discontinued. Recent investigations in the context of the inventory of emissions, discharges and losses of priority substances show that even municipal sewage plants in

[48] Pirrone, N., Cinnirella, S., Feng, X., Finkelmann, R.B., Friedli, H.R., Leaner, J., Mason, R., Mukherjee, A.B., Stracher, G., Streets, D.G., Telmer, K., Global Mercury Emissions to the Atmosphere from Natural and Anthropogenic Sources, in: Mason, R. (Ed.), Pirrone, N. (Ed.), Mercury Fate and Transport in the Global Atmosphere, Springer US, 2009, 1-47.

[49] Pacyna, E.G., Pacyna, J.M., Steenhuisen, F. Wilson, S., Global anthropogenic mercury emission inventory for 2000, Atmospheric Environment 40, 2006, 4048-4063.

Germany are only responsiblefor a very small input totalling around 16.5 kg/a on average for the years 2006-2008. In 2011, mercury emissions into the environment in Germany came to 9.49 t, of which 1.4 t was due to inputs into water bodies[50]. The energy sector, with 81%, plays a major role in the present emissions situation.
At the present time it is not possible to provide a quantitative description of the share of water body/biota pressures due to airborne mercury.
Furthermore, there are extensive deposits of mercury in water body sediments as a result of earlier, mainly industrial discharges into water bodies, and these are to some extent capable of being re-mobilised by flood events.

The environmental quality standard for mercury

Mercury is a toxic heavy metal. Organic compounds of mercury are particularly toxic. Mercury in water bodies or sediments is converted into methyl mercury and finds its way into the food chain. To protect predators at the top of the food chain from poisoning, a biota environmental quality standard of 20 µg/kg fresh weight (fish, shellfish, crustaceans) was laid down in Directive 2008/105/EC and transposed in the Ordinance for the protection of surface waters in 2011. The biota environmental quality standard reflects the bioavailability of mercury. LAWA working paper RaKon IV.3 “Concept for biota studies for monitoring environmental quality standards” laid down for Germany the application of the biota environmental quality standard for mercury in fish. This established the legal and technical foundations for applying this environmental quality standard when updating the management plans in 2015.
Article 3 (2) of Directive 2013/39/EU confirms the biota EQS of 20 µg/kg for mercury and lays down that measurements are to be made in fish. The option of falling back on stricter environmental quality standards for water if the EQS in biota is not used has been dropped. The biota-related EQS is now used in the updated management plans and programmes of measures for the river basins for the period 2015 to 2021. This objective is basically to be complied with by 2021.

Pressures on water bodies

In a UBA report dating from 2010 it was noted that compliance with an environmental quality standard of 20 µg/kg for mercury in fish was extremely problematical[51]. This was not only found to be the case for studies of fish in the Elbe, Saale, Rhine, Danube and Saar. The mercury concentrations in fried fish from remote regions (Alaska, Canada, Norway) are mostly also in the range 20-100 µg/kg, depending on the age and size of the fish tested, and only in a few individual cases were they less than 20 µg/kg. It therefore seems that this level of concentrations, as also found in the reference waters of the

[50] UBA: http://www.umweltbundesamt.de/themen/luft/emissionen-von-luftschadstoffen
[51] Wellmitz, J., Vergleich der EU-Umweltqualitätsnorm (UQN) für Quecksilber in biologischen Matrizes mit der Belastungssituation in deutschen Oberflächengewässern – Stand der Belastung und Vorschläge für Handlungsoptionen, Bericht des UBA 2010.

environmental sample base, can be regarded as a ubiquitous background concentration in fish from otherwise uncontaminated waters.
The mercury concentration in the musculature of bream exceeds the biota EQS by a factor of between 5 and 20 in the Rhine and Elbe (contamination of bream in the Elbe is roughly twice as high). In the Elbe a downward trend can be observed in mercury concentrations in bream and suspended solids (90% reduction between 1985 and 2005 to 3 mg/kg in sediments originating from suspended solids in Schnackenburg), whereas no clear trends are evident in suspended solids in the Rhine, where concentrations have generally been considerably lower over the past 20 years[51]. Studies of fish in European lakes between 2005 and 2010 also showed that the environmental quality standards for mercury in biota were exceeded by a factor of between 2 and 16[52].
However, the mercury concentrations currently measured in aquatic organisms are not only caused by emissions from “active” sources, but also by uptake of mercury from legacy contamination or deposits of mercury pollution within the global cycle. According to the Federal Environment Ministry, one of the main reasons for the high mercury concentrations in biota is the accumulation of mercury in the sediments of water bodies.
A publication by Hope and Louch (2013)[53] calculated scenarios for mercury concentrations in fish more than 4000 years ago, i.e. before the industrial age. These calculations indicate that the predatory fish would have exceeded present-day environmental quality standards. It must also be noted that both the catchment area, e.g. the proportion of wetlands, and the characteristics of a water body have an influence on how mercury behaves in the environment, e.g. its conversion to methyl mercury.

[52] Vignati, D.A.L., Polesello, S., Bettinetti, R., Bank, M.S., Mercury environmental quality standard for biota in Europe: opportunities and challenges, Integr Environ Assess Manag 9, 2013, 167-168.
[53] Hope, B.K. und Louch, J, Pre-Anthropocene mercury residues in North American freshwater fish, Integr Environ Assess Manag 10, 2013, 299-308.

Table 28 and Map 5 show the chemical status of the surface water bodies in Lower Saxony. In view of the state-wide non-compliance with the environmental quality standard for mercury in biota, no water body achieves good chemical status. In Lower Saxony's coastal waters, for example, mercury concentrations in biota (fish, shellfish) were found to exceed the environmental quality standards.

Table 28: Assessment of chemical status with mercury in biota – All surface water bodies

	Chemical status Number of water bodies		
	Flowing waters		**Substances**
	Good	**Not good**	
Chemical status	**-**	**1,562**	
Heavy metals	-	1,562	Mercury
	Standing waters		
	Good	**Not good**	
Chemical status	**-**	**27**	
Heavy metals	-	27	Mercury
	Transitional and coastal waters		
	Good	**Not good**	
Chemical status	**-**	**16**	
Heavy metals	-	16	Mercury

4.2.3.2 Chemical status of surface waters without mercury in biota

To make it possible to show the results for the other substances and substance groups, Table 29 and Map 6 show the results for flowing waters broken down by the substance groups heavy metals (excluding mercury), pesticides, industrial pollutants and other substances. The adoption of Directive 2013/39/EU extended the list of ubiquitous substances. As well as mercury, the eight substances/substance groups classified as ubiquitous include tributyl tin and the polycyclic aromatic hydrocarbons.
Since chemical investigation of all water bodies in Lower Saxony would be too time and cost intensive, the table makes a distinction between "measured" and "interpolated" chemical status. Interpolation was largely on the basis of the chemical status of neighbouring water bodies for which study results were available. Even with the aid of interpolation, it is not possible to provide a technically reliable state-wide description of the chemical status of all flowing waters in Lower Saxony. For this reason, 1,051 flowing waters were not included in the assessment of chemical status with ubiquitous substances.

Table 29: Assessment of chemical status on the basis of substance groups, with ubiquitous substances – Flowing waters (multiple entries possible for each water body)

	Chemical status (with ubiquitous substances) – measured – Number of water bodies		
	Good	**Not good**	Substances
Chemical status	**49**	**59**	**Cadmium, isoproturon, polycyclic aromatic hydrocarbons, fluoranthene, tributyl tin**
Heavy metals (without mercury)	102	6	Cadmium
Pesticides	106	2	Isoproturon
Industrial pollutants	108	-	-
Other substances	52	56	Polycyclic aromatic hydrocarbons, fluoranthene, tributyl tin
	Chemical status (with ubiquitous substances) – interpolated – Number of water bodies		
	Good	**Not good**	Substances
Chemical status	**307**	**96**	**Cadmium, isoproturon, polycyclic aromatic hydrocarbons, fluoranthene, tributyl tin**
Heavy metals (without mercury)	347	56	Cadmium
Pesticides	346	1	Isoproturon
Industrial pollutants	347	-	-
Other substances	307	40	Polycyclic aromatic hydrocarbons, fluoranthene, tributyl tin
Chemical status – assessment not possible – Number of water bodies			
1,051			

It is not possible to perform a chemical assessment for all lakes in Lower Saxony, because chemical investigation of all lakes would be too time and cost intensive, and interpolation of the results for other lakes is not technically correct. Nine standing waters were assessed (cf. Table 30 and Map 6). Zwischenahner Meer exceeded the environmental quality standard for tributyl tin. Tributyl tin was formerly used in ships paint and was banned worldwide in 2008 because of its very high eco-toxicity. Tributyl tin was also found in Steinhuder Meer. There were also finds in the substance group of polycyclic aromatic hydrocarbons such as benzo(a)pyrene and fluoranthene.

Table 30: Assessment of chemical status on the basis of substance groups, with ubiquitous substances – Standing waters (multiple entries possible for each water body)

	Chemical status (with ubiquitous substances) Number of water bodies		
	Good	**Not good**	Substances
Chemical status	**7**	**2**	**Tributyl tin, polycyclic aromatic hydrocarbons, fluoranthene**
Heavy metals (without mercury)	9	-	-
Pesticides	9	-	-
Industrial pollutants	9	-	-
Other substances	7	2	Tributyl tin, polycyclic aromatic hydrocarbons, fluoranthene
Chemical status – Assessment not possible Number of water bodies			
18			

At places in the transitional and coastal waters, the concentrations of polycyclic aromatic hydrocarbons, such as benzo(a)pyrene and benzo(ghi)perylene, that exceeded the environmental quality standard were also measured in the water. In the highly turbid transitional waters of the Ems, elevated concentrations of the polycyclic aromatic hydrocarbons benzo(b)fluoranthene and benzo(k)fluoranthene were found in addition to the two compounds already mentioned. Moreover tributyl tin, which is also one of the ubiquitous substances, exceeds the current environmental quality standard laid down in the Surface Waters Ordinance in the transitional waters of the Ems (Leer to Dollart) and Weser (cf. Table 31 and Map 6).

Table 31: Assessment of chemical status on the basis of substance groups, with ubiquitous substances – Transitional and coastal waters (multiple entries possible for each water body)

	Chemical status (with ubiquitous substances) – measured – Number of water bodies		
	Good	Not good	Substances
Chemical status	**2**	**6**	**Tributyl tin, polycyclic aromatic hydrocarbons, fluoranthene**
Heavy metals (without mercury)	8	-	-
Pesticides	8	-	-
Industrial pollutants	8	-	-
Other substances	2	6	Tributyl tin, polycyclic aromatic hydrocarbons, fluoranthene
	Chemical status (with ubiquitous substances) – interpolated – Number of water bodies		
	Good	**Not good**	Substances
Chemical status	**4**	**4**	**Polycyclic aromatic hydrocarbons**
Heavy metals (without mercury)	8	-	-
Pesticides	8	-	-
Industrial pollutants	8	-	-
Other substances	4	4	Polycyclic aromatic hydrocarbons

4.2.3.3 Chemical status of surface waters, without ubiquitous substances

Various substances that are taken into account in chemical assessment occur everywhere in the aquatic environment, i.e. they are ubiquitous. In many cases these substances are not readily degradable and may still be found in the water bodies even if measures have already been taken to reduce or eliminate emissions of such substances.
One example of a ubiquitous substance is tributyl tin. Tributyl tin has been banned in the EU since 2003, and worldwide since 2008. Tributyl tin is very slow to degrade, especially in aquatic sediments. For this reason, 44 of the 140 measuring stations investigated in Lower Saxony continued to exceed the environmental quality standard for tributyl tin. Further measures are only possible on a minor scale (cf. Lower Saxony contribution to the programs of measures 2015 to 2021 for the Elbe, Weser, Ems and Rhine river basins, NLWKN 2014b).

To provide a differentiated picture compared with the contamination with priority hazardous substances, results without ubiquitous substances are also shown (cf. Table 32 and Map 7). The non-ubiquitous substances which were found to exceed the standards at measuring stations include cadmium, isoproturon, hexachlorobenzene and fluoranthene. A

consideration of this selection reveals the following picture for flowing waters in Lower Saxony:

Table 32: Assessment of chemical status on the basis of substance groups, without ubiquitous substances – Flowing waters (multiple entries possible for each water body)

	Chemical status, (without ubiquitous substances) – measured – Number of water bodies		
	Good	**Not good**	Substances
Chemical status	**82**	**26**	**Cadmium, isoproturon, hexachlorobenzene, fluoranthene**
Heavy metals	102	6	Cadmium
Pesticides	106	2	Isoproturon
Industrial pollutants	108	0	-
Other substances	85	23	Hexachlorobenzene, fluoranthene
	Chemical status, (without ubiquitous substances) – interpolated – Number of water bodies		
	Good	**Not good**	Substances
Chemical status	**335**	**68**	**Cadmium, isoproturon, hexachlorobenzene, fluoranthene**
Heavy metals	347	56	Cadmium
Pesticides	346	1	Isoproturon
Industrial pollutants	347	0	-
Other substances	335	12	Hexachlorobenzene, fluoranthene
Chemical status (without ubiquitous substances) – assessment not possible – Number of water bodies			
856			

In the case of lakes and transitional and coastal waters, the only member of the group of non-ubiquitous substances that was detected at a few measuring stations was fluoranthene (cf. Tables 33 and 34 and Map 7).

Table 33: Assessment of chemical status on the basis of substance groups, without ubiquitous substances – Standing waters (multiple entries possible for each water body)

	Chemical status (without ubiquitous substances) – measured – Number of water bodies		
	Good	**Not good**	Substances
Chemical status	**8**	**1**	**Fluoranthene**
Heavy metals	9	0	-
Pesticides	9	0	-
Industrial pollutants	9	0	-
Other substances	8	1	Fluoranthene
Chemical status – Assessment not possible Number of water bodies			
18			

Table 34: Assessment of chemical status on the basis of substance groups, without ubiquitous substances – Transitional and coastal waters (multiple entries possible for each water body)

	Chemical status (without ubiquitous substances) – measured – Number of water bodies		
	Good	**Not good**	Substances
Chemical status	**5**	**3**	**Fluoranthene**
Heavy metals	7	-	-
Pesticides	7	-	-
Industrial pollutants	7	-	-
Other substances	5	3	Fluoranthene
	Chemical status, (without ubiquitous substances) – interpolated – Number of water bodies		
	Good	**Not good**	Substances
Chemical status	**8**	**-**	**-**

Concentrations of fluoranthene in excess of the environmental quality standard were measured in the transitional waters of the Ems and the Weser. Hexachlorobenzene was found in the transitional water of the Elbe. Thus the transitional waters do not have good chemical status even when non-ubiquitous substances are considered (cf. Map 7).

4.2.4 Conclusions

Flowing waters:

In the flowing waters category, 94% of natural water bodies and 99% of artificial and heavily modified water bodies have failed to achieve good ecological status or good ecological potential.
As far as chemical status is concerned, the situation for all flowing waters is “not good”. Problematic substances that present obstacles to achieving the objectives are the heavy metals mercury and cadmium, tributyl tin, and polycyclic aromatic hydrocarbons, fluoranthene and, in isolated cases, hexachlorobenzene and isoproturon.

Standing waters:

In the flowing waters sector in Lower Saxony, 91% of the natural water bodies do not possess good ecological status. 25% of heavily modified and 75% of artificial water bodies fail to achieve good ecological potential. In view of the excessive mercury levels in biota, no standing water body has achieved good chemical status. Further cases of environmental quality standards being exceeded have been found for tributyl tin, various polycyclic hydrocarbons and fluoranthene.

Transitional and coastal waters:

None of the water bodies in the transitional and coastal waters sector was found to possess good ecological status/good ecological potential or, in view of the excessive concentrations of mercury in biota, good chemical status. In addition to mercury, these waters also show conspicuous levels of the substances or substance groups polycyclic hydrocarbons, fluoranthene and tributyl tin.

4.3 Monitoring and status of groundwater

4.3.1 Monitoring of groundwater

The existing monitoring system was adapted to the requirements of the WFD in the field of groundwater monitoring as well (cf. Chapter 4.1). The following key points can be distinguished:

- monitoring of the assessment of quantitative status in all groundwater bodies, and
- monitoring of the assessment of chemical status in all groundwater bodies.

Whereas no difference is made between different monitoring intensities in the case of quantitative monitoring, a distinction is made between surveillance monitoring and

operational monitoring in the case of quality monitoring. The number of measuring stations in Lower Saxony is shown inTable 35.

Table 35: Measuring stations in groundwater

Number of measuring stations for monitoring chemical status	Number of measuring stations for monitoring quantitative status
1,084	1,122

The monitoring network in Lower Saxony was set up in accordance with the requirements of Articles 7 and 8 of the WFD. It was designed to ensure that a coherent and comprehensive overview of groundwater status exists in every catchment area. Responsibility for selecting the measuring stations rested with the branches of the Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency (NLWKN), so that allocation of the measuring stations could be based on local and regional knowledge.
The agency collaborated closely with the Lower Saxony Agency for Mining, Energy and Geology (LBEG), which provided a wealth of statewide hydrogeological data for determining the measuring stations. The LBEG also prepared further information for the groundwater bodies as part of a pedological and hydrogeological model, such as geological cross-sections and the characterisation of individual areas that were to be as uniform as possible from a hydrogeological, hydrodynamic, hydrochemical and pedological point of view.
The measuring concept for the set envisages one measurement per month or 12 measurements per year and is based as far as possible on measuring stations with data series going back many years.

4.3.2 Groundwater status

4.3.2.1 Groundwater – Quality

Good chemical status exists if the threshold figures to be complied with under Section 7 and Annex 2 of the groundwater ordinance are not exceeded at any measuring station, or if monitoring shows that there are no signs of pollutant inputs as a result of human activities, the quality of the groundwater does not result in any significant deterioration in the ecological or chemical status of the surface waters and the groundwater quality does not give rise to any significant damage to the terrestrial ecosystems directly dependent on the groundwater body.
The Groundwater Ordinance contains criteria and methods for determining the chemical status of the groundwater. The conductivity and the measured pollutant concentrations of the parameters pursuant to Annex 2 of the Groundwater Ordinance for the groundwater body in question are to be taken as parameters for determining chemical status.
The results of the inventory and monitoring processes form the basis for assessing the chemical status of the groundwater bodies at the end of the first management period. Information on the methods and procedures can be found in the Guide to assessing the chemical status of groundwater bodies in Lower Saxony and Bremen in accordance with the

Water Framework Directive (WFD) (NLWKN 2014). The assessment method has not changed compared with the assessment method for 2009.
Status assessment for the parameter “nitrate” was based on the data for 2008 to 2013, the latest annual mean for 2013 and the emission investigations or the calculation of the potential concentration of nitrate in seepage water (LBEG 2013) on the basis of the agricultural statistics for 2007 and 2010.
For crop protection agents, the assessment was based on the actual data for 2009 to 2013. The data for 2004 to 2009 were used for plausibility checking and taken into account in the assessment, if other measuring stations in the groundwater body were found to have up-to-date figures exceeding the threshold values.
For other parameters (arsenic, cadmium, lead, mercury, ammonium, chloride, sulphate, tri- and tetrachloroethene) assessment was on the basis of the data for 2008 to 2013.
In the case of transboundary water bodies, the assessment results were co-ordinated with the neighbouring federal states. Map 8 and Table 36 shows the results for the assessment of chemical status.

Table 36: Results of chemical status assessment for groundwater bodies (GWB)

Total number of GWBs	Number of groundwater bodies							
	Bad chemical status *Nitrate*		Bad chemical status *Crop protection agents*		Bad chemical status *Other pollutants*		Bad chemical status Total	
	Total	%	Total	%	Total	%	Total	%
90	42	47	10	11	8	9	44	49

Table 103 in Appendix B-3 shows the assessment result for every groundwater body located in Lower Saxony. A breakdown of the groundwater bodies by river basins can be found in Appendix B-2.
The risk assessment for Lower Saxony’s groundwater bodies revealed conspicuous findings for the parameters nitrate, crop protection agent active ingredients and cadmium, whereas no significant conspicuous findings were identified for ammonium, arsenic, lead, chloride, mercury and sulphate, having regard to geogenic background levels.

Nitrate

The assessment of groundwater quality for the parameter “nitrate” showed that 42 water bodies in Lower Saxony had to be classified as having “bad status” (cf. Map 9). The main reason for nitrate contamination in the groundwater was agricultural land uses and the associated nitrate surpluses from farmyard manure and mineral fertilisers. The nitrate in the sandy soils of the geest with their low retention capacity and high groundwater recharge rates very readily migrates into the groundwater. In the solid rock areas there is often little or

no overburden, and denitrification processes cannot take place at all or only on a limited scale.
48 groundwater bodies were found to have good status for the parameter “nitrate”. The majority of these groundwater bodies were located in southern Lower Saxony (solid rock regions) and in the coastal marshlands and the East Frisian islands. As a rule, the groundwater conditions prevailing in marshland and lowland areas have a reducing effect, with the result that nitrate is degraded and only low nitrate concentrations can be found in the groundwater, even in areas of intensive agricultural use.

Crop protection agents

Crop protection agents are chemical or biological active ingredients and preparations that protect plants and plant products from harmful organisms (fungicides and insecticides) and undesirable competing plants (herbicides) or act on plants in some other way.
The assessment classified 10 groundwater bodies as having “bad status” due to inputs of crop protection agent active ingredients (cf. Map 10). “Non-relevant metabolites” were disregarded when assessing the groundwater bodies.

Cadmium

As a result of conspicuous cadmium concentrations, eight groundwater bodies were found to have “bad status” (cf. Map 11). In addition to phosphate fertilisers containing cadmium, possible sources include inputs from the atmosphere or natural release of carbonate minerals. Furthermore, cadmium is frequently found in groundwater where the buffer capacity of the underlying soils or strata is low, because the mobility of cadmium rises sharply with falling pH.
The “other pollutants” in Table 36 are exclusively cases of cadmium pollution. All other parameters in Lower Saxony showed no significant pollution.

4.3.2.2 Groundwater – Quantity

The results of the inventory and monitoring processes form the basis for assessing the quantitative status of the groundwater bodies. Information on the methods and procedures can be found in the Guide to assessing the quantitative status of groundwater bodies in Lower Saxony and Bremen in accordance with the Water Framework Directive (WFD) (NLWKN 2013b).
According to Section 4 of the Groundwater Ordinance, the quantitative groundwater status is good if

- the development of groundwater levels or spring discharges shows that the long-term mean annual groundwater abstraction does not exceed the available groundwater resource, and
- changes in groundwater levels due to human activities will not in future result in

- ⇨ failure to achieve the management objectives pursuant to Sections 27 and 44 of the Federal Water Act for surface waters with hydraulic connections to the groundwater body,
- ⇨ significant deterioration of the status of such surface water bodies within the meaning of Section 3 No. 8 of the Federal Water Act,
- ⇨ significant damage to terrestrial ecosystems that are directly dependent on the groundwater body, and
- ⇨ adverse changes taking place in the groundwater due to inflows of saltwater or other pollutants as a result of changes of a limited temporal and spatial nature in the direction of groundwater flow.

According to the decree dated 25.03.2014 -Ref23-62170/06-0006- by the Lower Saxony environment ministry, a groundwater body has bad quantitative status if, in addition to the anthropogenic change in groundwater level, at least one of the protection objectives listed under Section 4 (2) of the Groundwater Ordinance is not achieved.
Thus assessment solely on the basis of groundwater level is not sufficient. The decree therefore recommends using the following as further parameters for assessment: water balance, groundwater-dependent terrestrial ecosystems, associated surface waters, and salt intrusion. Appropriate judgements of the relevant parameters were made in the course of the inventory.
The three groundwater bodies that were classified in the inventory as unclear with regard to the quantitative objective were subjected to more detailed examination. The same applies to the groundwater body Große Aa, for which achievement of the objective was classified as “endangered”. As a result, no groundwater body is classified as having bad status (cf. Map 12 and Table 37). No relevant environmental goods are affected in the groundwater bodies “Leda-Jümme”, “Große Aa” and “Leine unconsolidated left”. In the groundwater body “Wietze Fuhse unconsolidated” the potential adverse effects on the surface waters Wietze and Wuhlbeek have already been the subject of proceedings under water law, and their impacts have therefore been taken into account.
In the case of transboundary groundwater bodies, the assessment results were co-ordinated with the neighbouring federal states.

Table 37: Results of quantitative status assessment for groundwater bodies (GWB)

Good status Number of GWBs	Failing to achieve good Number of GWBs
90	0

4.4 Monitoring and status of protected areas

Water bodies designated for the abstraction of water intended for human consumption

In accordance with Article 7 of the WFD, water bodies used for drinking water abstraction are to be assessed not only in accordance with the provisions of the WFD, but also on the basis

of the quality standards of the Directive on drinking water quality (98/83/EG, Drinking Water Directive). The directive was transposed into national law in the Ordinance on the quality of water for human use (Drinking Water Ordinance, Federal standard).
Under Article 7 of the WFD, water bodies from which an average of more than 10 m³ per day is abstracted for human use are to be listed in the management plans. Water bodies with drinking water abstraction of 100 m³ per day are also to be assessed in accordance with the quality standards of the Directive on drinking water quality. Such water bodies are monitored in accordance with the provisions of Article 7 of the WFD. As regards the Directive on drinking water quality, all cases of drinking water abstraction are subject to monitoring by the health authorities pursuant to Section 18 ff. of the Drinking Water Ordinance. For installations abstracting more than 1,000 m³ per day, the results of such monitoring are notified to the European Commission.
In the case of those water bodies which are used for drinking water purposes, the initial objective is to achieve good chemical and good ecological status for surface waters and good qualitative and good chemical status for groundwater. However, not only do water bodies from which drinking water is abstracted have to achieve the objectives of Sections 27 and 47 and Article 4 of the WFD (including the quality standards laid down at Community level under Article 16), but the water produced must also satisfy the requirements of the Drinking Water Directive (98/83/EC), having regard to the water treatment method used and the provisions of Community law.

In Lower Saxony, water for human consumption is taken from surface water bodies and groundwater bodies. The status of the surface and groundwater bodies from which water is abstracted for drinking water production is shown in the following tables.
Table 38 shows an analysis of the status of the relevant surface water bodies, broken down by

- Criteria of the WFD: Good ecological and chemical status of the surface water bodies, and
- Criteria of the Drinking Water Directive: Non-compliance with Drinking Water Ordinance.

Table 38: Analysis of status of surface water bodies for the abstraction of drinking water pursuant to Art. 7 WFD

Number of SWBs	Number of SWBs DW abstraction > 10 m³/d	Number of SWBs with facilities for DW abstraction > 1,000 m³/d			
		Total	Ecological status/potential less than good	Chemical status not good	Non-compliance with DWO *in DW*
Total	Total				
1,605	9	7	5	7	0

Five water bodies from which drinking water is abstracted do not possess good ecological status. One river cannot be assessed. All rivers failed to achieve good chemical status as a

result of state-wide contamination with mercury in biota. The quality of the drinking water taken from surface waters fully satisfies the requirements of the Drinking Water Ordinance.

Table 39 shows an analysis of the status of the relevant groundwater bodies, broken down by

- Criteria of the WFD: Exceedance of environmental quality standards/ threshold values for assessing the chemical status of the groundwater bodies, and
- Criteria of the Drinking Water Directive: Non-compliance with Drinking Water Ordinance.

Table 39: Analysis of status of groundwater bodies for the abstraction of drinking water pursuant to Art. 7 WFD

Number of GWBs Total	Number of GWBs DW abstraction > 10 m³/d Total	Number of GWBs with facilities for DW abstraction > 1,000 m³/d				
		Total	with exceedance EQS nitrate *in GW*	with exceedance EQS crop protection agents *in GW*	with exceedance Other pollutants *in GW*	with non-compliance with DWO *in DW*
90	89	89	42	10	8	0

It should be noted that the bad status of groundwater bodies is due to their bad chemical status (infringement of environmental quality standards, cf. Chapter 4.3.2.1). In Lower Saxony there is no evidence of bad status regarding the quality of drinking water obtained from groundwater bodies.
Throughout Lower Saxony, the water available for drinking water supplies complies fully with the provisions of the Drinking Water Ordinance. This assessment covers all drinking water abstraction areas, which supply about 94% of the population of Lower Saxony with drinking water. About 87% of drinking water comes from groundwater or spring water, about 12% from surface waters (reservoirs) and less than 1% from other sources (e.g. riverbank filtrate).

Areas designated for the protection of economically significant aquatic species (fishing waters/shellfish waters)

The Fish Water Directive (78/659/EEC) and the Shellfish Water Directive (79/923/EEC) ceased to apply on 22.12.2013. Where the WFD does not cover the requirements of the directives, these will be taken into account in the revision of the Surface Waters Ordinance. All fish waters and shellfish waters are included in the activities for implementing the WFD.

Recreational and bathing waters

The basis for monitoring bathing water quality is the Directive concerning the management of bathing water quality 15 February 2006 (2006/7/EG, revised version). In Lower Saxony it was

transposed into state law by means of the “Lower Saxony ordinance on the quality and management of bathing waters” (Bathing Waters Ordinance – BadgewVO) of 10 April 2008.

A bathing water is any section of a surface water body for which the competent authority expects a large number of bathers and for which it has not issued a permanent ban on bathing or does not permanently advise against bathing. The purpose of the directive is to conserve and protect the environment, improve its quality and protect human health. Since the Bathing Waters Ordinance pursues interministerial objectives, it is a joint ordinance of the Ministry of Social Affairs, Health and Gender Equality and the Ministry of the Environment, Energy and Climate Protection. It is lead managed by the Ministry of Social Affairs. The quality of bathing waters is monitored by means of a special measuring programme run by the health authorities, and their hygienic status is assessed on the basis of defined quality parameters. The focus is on protecting the health of the bathers.
The objective of the directive is that all bathing waters should possess at least poor status by the end of the 2015 bathing season. Furthermore, realistic and reasonable steps should be taken to increase the number of bathing waters classified as good or excellent.

In general, the measures planned to achieve the objectives of the WFD are aimed at improving bathing water quality by reducing substance inputs and associated blooms of cyanobacteria. The bathing water profile is a supplement to the water management requirements already laid down by the WFD with the aim of protecting bathers from health risks. Bathing water profiles, which are regularly reviewed, are created for all bathing waters. These make appropriate use of the data obtained from monitoring and assessment of water bodies under the WFD. In the event of non-compliance with the objectives of the Bathing Waters Directive they can form the basis for the planning and implementation of further management measures.

The assessment of bathing waters in accordance with the Bathing Waters Directive in the categories excellent, good, poor and inadequate quality is performed at the end of each bathing season and submitted to the European Commission in an annual report. Up-to-date descriptions are published in the Lower Saxony Bathing Waters Atlas (www.apps.nlga.niedersachsen.de/eu/batlas/). Nearly all bathing waters in Lower Saxonys are of excellent quality. Since the descriptions of bathing water status are notified to the European Commission in separate reports in accordance with the directive, there is no need to provide detailed information here.

Sensitive and nutrient-sensitive areas

The objectives and the implementation of the Urban Waste Water Directive and the Nitrates Directive are an important basis for the management of surface waters and groundwater bodies under the WFD with the aim of good status. The Urban Waste Water Directive (91/271/EEC) sets out the minimum requirements for wastewater discharged into water bodies from municipal sewage plants. The objective of the Nitrates Directive (91/676/EEC) is to reduce or prevent direct and indirect contamination, especially due to nitrate inputs from

the agricultural sector. Since the status descriptions are notified to the European Commission in separate reports in accordance with the directives, there is no need to provide detailed information here.

Water-dependent bird sanctuaries and Habitats Directive areas

When coordinating monitoring programmes, WFD monitoring in water-dependent Natura 2000 areas is in particular to be co-ordinated at an early stage with the monitoring of Natura 2000 areas. For example, water bodies or sections of water bodies in Natura 2000 areas are to be included in the operational monitoring procedure of the WFD in all cases where the objectives for conserving habitat types and water-dependent species are influenced by the water quality or quantity and they therefore failed to achieve the management objectives.
The results must be taken into account when establishing or updating the operational monitoring system under the WFD. If the results show evidence of water-related risks to and impairment of water-dependent species and habitat types, e.g. disturbances of the water balance that make it impossible to achieve the defined conservation objectives, appropriate measures must be taken.

The procedure for monitoring in Natura 2000 areas is described in the “Lower Saxony monitoring programme under the Water Framework Directive for the Elbe, Weser, and Rhine river basins” (NLWKN 2007).

In accordance with Section 29 (4) of the Federal Water Act and Article 4 (1 c) of the WFD, the objectives and standards of the WFD in the water-dependent protected areas are also to be achieved by 2015. Article 4 (2) of the WFD provides that in the case of water bodies affected by more than one of the objectives stated in Article 4 (1) of the WFD, the more ambitious objective shall apply. The inclusion and consideration of the water-dependent Natura 2000 areas in the WFD is intended to ensure that management planning under the WFD also contributes to achieving the objectives of the Habitats Directive and Birds Directive (92/43/EEC and 79/409/EEC) in these areas and at the same time prevents the relativisation of any stricter regulations for the protected area in question.
Two thirds of the habitat types in Annex I to the Habitats Directive that are found in Lower Saxony are classified as water-dependent or as water-dependent in certain variations. In addition to the actual flowing waters and accompanying perennial bank vegetation and water-meadow forests, these include many other – sometimes small-scale – Habitats Directive habitat types with moderate to high sensitivity to lowering of water levels, such as alluvial meadows of *Cnidion dubii*, still waters of varying trophic states, wet oak- hornbeam forests, *Molina* meadows, wet *Erica* heathlands, active raised bogs, transition mires and quaking bogs, and animal and plant species in the annexes to the Habitats Directive that are tied to aquatic habitats and groundwater-dependent habitats. In the Lower Saxony strategy for species and biotope protection, these habitats are largely classified as having high or highest priority and an urgent to priority need for action (NLWKN 2011a).

On present knowledge, the water-related requirements and conservation objectives for the occurrence of water-dependent habitat types and species are to be taken into account at least on parts of 85% of the notified Habitats Directive areas. The Lower Saxony contribution to the last Habitats Directive report[54] in 2013 mentioned anthropogenic hydromorphological changes and substance pollution of surface waters as a major medium term risk for the conservation status of water-dependent Habitats Directive habitat types, in addition to other risk factors. In view of the continued existence of impairments due to development, maintenance and inputs of nutrients and sand and fine sediment, the conservation status of river habitat types had to be assessed as unfavourable to bad.

The technical planning basis for localising the occurrence of water-dependent Habitats Directive habitat types in Lower Saxony's Habitats Directive areas and for selecting possible area-based measures is the acquisition of basic data by the NLWKN, which has been pursued on a state-wide basis since 2001. In view of the results of this basic data, it is planned to update the standard data sheets for 2015 (e.g. estimate of significance and status of habitat type occurrences in the individual Habitats Directive areas, possibly incorporation of new findings on the occurrence of species listed in the annexes to the Habitats Directive).

Since the status descriptions are notified to the European Commission in separate reports in accordance with the directives, there is no need to provide detailed information here.

[54] The 2013 national report on the implementation of the Habitats Directive can be found on the website of the Federal Nature Conservation Agency.

5 Environmental/management objectives

5.1 Supra-regional strategies for achieving the environmental objectives

The core idea in the development of the Water Framework Directive was that it should be possible to consider and develop the water bodies independently of administrative boundaries. In line with this core idea, supra-regional strategies were developed for achieving the environmental objectives in the four river basins in which Lower Saxony has a share. The basis for updating is the LAWA product data sheet “Identification of supra-regional management objectives in the river basins under German lead management” (LAWA 2012f).

The main water management issues are concerned with the major inter-state problems in the river basins and indicate the subject areas for which joint supra-regional action is necessary. In the second management period as well, highly significant key pressures in all river basins continue to include considerable hydromorphological changes in flowing waters, including continuity deficits, and significant contamination of surface waters and groundwater by nutrients and pollutants (RBC Elbe 2013, RBC Ems 2013, RBC Weser 2013)[55]. These issues are still topical in Lower Saxony during the second management period. In view of their complexity, work on the issues will continue throughout the three management periods.

Supra-regional cooperation is of essential importance, especially for the objective of restoring continuity. Supra-regional priority water bodies are selected in each of the four river basins for restoration of continuity on a priority basis (e.g. “Establishment of continuity for fish and cyclostomata in the priority water bodies of the Ems international river basin unit”, RBC Ems 2012). The major fish migration routes in Lower Saxony are part of these various concepts, and priority measures are to be taken in these waters to restore continuity (cf. Lower Saxony contribution to the programmes of measures for the Elbe, Weser, Ems and Rhine river basins).

Joint action is also necessary to combat nutrient pollution. The coastal waters are a particularly clear example of this. A target value of 2.8 mg/l total nitrogen at the limnic/marine transition point for all rivers flowing into the German North Sea can make a significant contribution to achieving the environmental objectives for coastal waters in the medium to long term (BLMP 2011). The target values can only be achieved by means of measures that cover the entire river basin district (coastal, transitional and in particular hinterland waters including their catchment areas). For this reason, transferring the marine ecology objectives

[55] The documents on the main water management issues for the four river basins can be found on the NLWKN website: www.nlwkn.niedersachsen.de

to the hinterland requires close technical cooperation between all responsible bodies. To this end, LAWA has published “Recommendations on applying marine ecology reduction objectives of river origin to the hinterland” (LAWA 2014b). It was recommended that the figure of 2.8 mg/l total nitrogen determined as a target figure for rivers flowing into the North Sea should also be used as a target figure for the hinterland waters. A statutory basis for the target value is to be created with the revision of the Surface Waters Ordinance.

The basic information on the nutrient situation will continue to be reviewed with the aid of modelling techniques (nutrient balance surpluses, nutrient inputs, nutrient loads and concentrations). For example, in the Weser river basin unit the project “AGRUM Weser: Analysis of agricultural and environmental measures in the field of agricultural water conservation in the Weser river basin unit in the context of the Water Framework Directive” (2009) will be continued as the project “AGRUM^{+}-Weser” (2014). The objectives pursued by this project include the following:

- actual situation analyses for nitrate and phosphate (balance surpluses, inputs into groundwater and surface waters),
- Determination of baseline scenario 2021 and forecast of the impacts on nitrate and phosphate contamination (balance surpluses, input into groundwater and surface waters),
- Determination of additional need for action on nitrate and phosphate going beyond the baseline scenario 2021, and estimation of the situation in groundwater and surface waters for 2027 on the basis of the nutrient surpluses calculated for 2021.

Pollutants will continue to be the focus of attention by the river basins and LAWA based on the transposition of Directive 2008/105/EC into the Surface Waters Ordinance and the new Directive of 2013 amending the WFD (2000/60/EC) and the Directive on Environmental Quality Standards (2008/105/EG) as regards priority substances in the field of water policy (2013/39/EU). In 2014 the Elbe River Basin Commission published its “Concept for pollutant and sediment management in the Elbe river basin” (FGG Elbe 2014a). Only a holistic approach to sediment management in the entire catchment area of the Elbe with effective source-specific measures or – if this is not possible – measures close to the source offers prospects of success. This is also in the interests of the WFD. As a result of their chemical properties, many priority and river basin specific pollutants tend to be preferentially stored in sediments. At times of increased discharge rates, contaminated sediments from calmer zones of the Elbe and its tributaries are a source of pollutant emissions that have impacts as far downstream as the North Sea. On the basis of this concept, the federal states are planning measures for the second management period.

A new issue to be addressed is the question of water volume management. Changes in the water balance, e.g. as a result of climate change and water body uses, can make it difficult to achieve the objectives in accordance with the WFD. To regionally varying extents, the impacts of climate change concern flood control due to increasing frequency and levels of extreme flooding, water supply due to changes in groundwater recharge and groundwater

quality and reservoir management, and the subject of low water levels in rivers. Climate change is an external pressure that is capable of affecting all other management issues (cf. Chapter 5.2). The first step on the way to a supra-regional water volume management concept for the German catchment area of the Elbe was to prepare the “Basis for a supra-regional water management system in the German catchment area of the Elbe having regard to changes in climate and land-use”. This basis provides an initial foundation for the planning of supra-regional measures to improve water volume management in the second management cycle.

Lower Saxony is also investigating the possible impacts of climate change and their effects on water resources management. Appropriate additions have been made to the Lower Saxony contribution to the programmes of measures for the river basins (cf. Lower Saxony contribution to the programmes of measures 2015 – 2021 for the Elbe, Weser, Ems and Rhine river basins).

As well as the issues addressed in all four river basins, there are various river basin specific topics. One example is the salt concentrations in the Werra and Weser. Despite the considerable reductions already achieved, the salt pollution of the Werra and Weser as a result of past and present potash mining continues to be an important water management issue in the Weser river basin. Further information can be found in the document “Detailed management plan 2015 to 2021 for the Weser River basin with regard to salt pollution pursuant to Section 83 of the Federal Water Act”.

5.2 Catering for climate change

As part of the Common Implementation Strategy (CIS) for supporting the implementation of the WFD in the member states, a guidance document was prepared on “River basin management in a changing climate”[56]. This document focuses largely on the links between the WFD and climate change, but also looks at flood risk management, water scarcity and droughts, and how they are expected to be affected by climate change.
On the basis of eleven guiding principles, the document describes what technical ideas/ aspects can be used to cater for climate change in the second management plan. These principles form the basis for the structure of the following chapter.

5.2.1 Climate trends in Germany

Since the beginning of the last century, the mean annual (air) temperature in Germany has risen by approximately 1°C[57]. This is the clearest sign of climate change; one example of visual evidence is the receding Alpine glaciers.
During the same period, the long-term average of mean annual rainfall in Germany has increased by around 10%[45], though there are sizeable regional differences within Germany. The increase in rainfall has largely taken place during the winter half-year (in some cases

[56] EU Commission 2009
[57] DWD – 27.04.2010 - Pressekonferenz des Deutschen Wetterdienstes zum Klimawandel in Deutschland, www.dwd.de/presse

more than 20% increase). In the summer months there is no clear trend for Germany as a whole. In some regions the increase in winter rainfall is more or less offset by the decrease in summer rainfall.
The studies of long-term patterns in meteorological and hydrological time series show that there can be very wide variations in the trends of rainfall and discharge parameters in individual catchment areas (unlike the clear increase in air temperature). There is therefore a need for detailed regional studies at river basin level.
The climate change that has taken place to date has already had an impact on the water balance of river basins. Most of these effects are not directly obvious, however, because management activities have been exerting increasing influence on the water balance for centuries. The influence of climate change on surface and subsurface water bodies can only be identified separately from the ongoing process of change in the spatial and temporal availability of water due to anthropogenic activities necessary to adapt to social needs, if the long-term behaviour of preferably uninfluenced series of measurements shows changes in the form of statistically significant trends.
The changes in climate in Germany with impacts on the water balance will continue in future, because climate research findings indicate that the temperature rise will be maintained.
On the whole, the following trends are expected:

- Further increase in mean air temperature,
- Increase in winter precipitation,
- Decrease in number of rain events in summer,
- Increase in heavy rainfall events as regards both frequency and intensity,
- Longer and more frequent periods of drought

Moreover there is a general expectation that in addition to the long-term changes in mean conditions, there will also be an increase in the frequency and intensity of extremes, as regards both temperature and rainfall.
The impacts will vary from region to region, however, which will make it necessary to take an approach based on river basins, or in the case of large catchment areas on smaller subdivisions, depending on state-specific conditions. In view of the existing uncertainties associated with the climate models, which make themselves felt in the form of sometimes considerable systematic variations in model calculations for a given reference period, especially with regard to precipitation (plausibility, statistical uncertainties), any statements about the possible development of extreme values have only been possible subject to a considerable range of variation. The smaller the region in question and the less frequent the extreme event, the greater the uncertainty.
The scale of climate change and the resulting impacts on the water balance can only be quantified with the aid of simulation calculations. However, the findings to date still involve uncertainties, especially with regard to future changes in rainfall. These primarily reflect the great variability of rainfall, from day to day, month to month, year to year, and even on the scale of decades. There are also model-related uncertainties, because rainfall is too small-scale and to complex to permit the exact simulation. These model uncertainties are

increased by the combination of global and regional models and different emission scenarios. Where climate projections are used, the uncertainties are imprinted on the results of downstream simulation models (water balance models, quality models, heat load models). These uncertainties will continue to exist despite further progress with climate research. It is therefore particularly important to quantify them as far as possible. This is preferably done by comparing model results with measured data for a lengthy control period (reference period), in order to assess the quality of the model. However, this will continue to be the case for quite some time because of the inadequate data situation, so these uncertainties will still exist despite further progress with climate research. It is therefore particularly important to quantify them as far as possible. This is preferably done by comparing model results with measured data for a lengthy control period (reference period), in order to assess the quality of the model. However, for quite some time this will not necessarily be possible because of the inadequate data situation with regard to various parameters of interest. Moreover, since different models yield different results for various parameters of interest, it will continue to be particularly important to record the uncertainties over a range of variation with the aid of an “ensemble approach”, in other words by using various models and combinations of models or by varying the model parameters.

5.2.2 Impacts on water resources management

In the long term, the predicted climate change can be expected to bring significant changes in the precipitation and evaporation regime in Germany as well (long-term changes in mean situation, seasonal distribution, fluctuations and extremes). We can therefore expect further impacts on the groundwater and soil water regime and on surface run-off. Depending on their scale, the changes in these elements of the hydrological cycle may have regionally varying direct effects on important segments of the water management sector, for example

- flood risk management and especially
  - ⇨ coastal defence – due to the faster rise in sea level and, as a consequence, storm tide levels and the resulting increase in risk,
  - ⇨ inland flood control – due to changes in the size, duration and frequency of flood water discharges and any resulting change in flood risk,
- groundwater resources and water supply – due to changes in groundwater recharge, groundwater quality and groundwater management,
- water body conservation – due to changes in seasonal run-off and temperature conditions with impacts on the materials balance of rivers and lakes and on biocenosis,
- water body development – due to changes in the dynamics of rivers and lakes, their morphological situation, their heat balance, and possibly reservoir management,
- water body use – due to increased heat input resulting from use of water for cooling purposes, or water abstraction for agricultural irrigation in particular,

- effects on the run-off situation – due to increased water storage for maintaining low water levels or for flood water retention.

In addition to these direct impacts, there are also indirect impacts on water bodies, e.g. as a result of changes in land use. Further information about possible direct and indirect impacts of climate change on water bodies and about action options for water management are listed in Appendix C.
There continues to be an urgent need for ongoing development of scientific and technical knowledge and findings for observing and calculating the impacts of climate change on the entire water balance.

5.2.2.1 Monitoring for the water management sector in the light of climate change

Monitoring has a variety of orientations: as an inventory of the actual situation and its ongoing development, for dynamic control of intervention in the water balance (e.g. water abstraction), and also as a means of controlling the progress of the impacts of measures. In all cases it is indispensable to use existing measuring stations/networks to record and analyse appropriate parameters or indicators in comparison with a reference condition. The orientation of the monitoring system may require further development of measuring networks to make it possible to answer the questions in hand.
Climate monitoring requires a synthesis of meteorological and hydrological parameters. For the quantitative side of the water balance it is therefore necessary to record at least the parameters air temperature, precipitation, run-off and groundwater level as an initial basis for analysing the past decades (sufficiently long periods of time – preferably 30 years or more); the selected representative series of measurements for catchment areas/planning periods are analysed for suitable parameters in terms of natural variability and change trends and, where appropriate, from the point of view of extreme value statistics as well. The same applies to the sea level parameter in the context of coastal defence.
Regular repetition of the process of analysis and comparison with the reference period, taking account of any other influences, permits quantitative representation of (measured) climate change signals. The results are also a necessary basis for assessing the simulated future changes.
This method can also be applied in a similar way to the field of qualitative hydrology, although the situation here is more complex. For the purpose of registering long-term water temperature patterns, sufficient numbers of adequate measurement series are available for making a quantitative record of trends resulting from global warming. However, climate change also brings about gradual changes in aquatic ecology; these relate in particular to biocenosis in rivers and lakes. In the longer term this may also result in changes in the reference conditions for quality assessment that were laid down in the context of the inventory. At present, however, it is not possible to reach any clear conclusions, because there are hardly any reliable series of measurements over a long period.
Investigations have therefore been made of the extent to which the existing monitoring programs under the WFD are sufficient for reliable measurement and analysis of the impacts

of climate change. Where the impacts of climate change constitute a risk to the planned achievement of the environmental objectives, targeted adaptation measures can be taken to counteract this if adequate findings are available. Climate monitoring based on aquatic ecology again plays an important role here with a view to ensuring timely identification of such developments in conjunction with quantitative trends making an appropriate response.

5.3 Objectives

On the whole, the main supra-regional pressures on water bodies in the river basin units under German lead management are very far-reaching and, in many cases, of historical origin. They can only be reduced by concerted efforts on the part of all the federal states and member states of a river basin unit. In the case of nutrient and pollutant contamination of the coastal water bodies and seas, salt pollution, transverse and impounding structures, the deviations from the objectives are so great and the necessary improvements so cost intensive that the management objectives can only be achieved gradually in steps extending across several management periods. It is therefore important to have recourse to and justify the statutory provisions of Sections 29 and 30 of the Federal Water Act. These state that the deadlines can in certain circumstances be extended for the purpose of gradual implementation of the objectives for water bodies. The possibility of divergent management objectives is to be investigated for water bodies in which the objectives cannot be achieved by 2027.

The status assessment results in Lower Saxony show that considerable deficits need to be remedied throughout the state in relatively short periods. Despite great efforts, achievement of good status/potential by 2021 is improbable or at risk in the majority of surface water bodies and a large number of groundwater bodies.
In the event that good status cannot be achieved, the Federal Water Act (Sections 29 and 30) and the WFP (Article 4) provide for the possibility of deadline extensions or divergent management objectives (cf. Table 40). In such cases the deadline for achieving good status/potential in surface waters and groundwater may be extended by two periods of six years, and thus ends not later than 22.12.2027. If natural conditions make it impossible to achieve the objectives, a date later than 2027 is possible. Divergent management objectives are based on taking account of temporary impairment of or changes in the properties of a water body.
If it becomes necessary to take advantage of deadline extensions or divergent management objectives, the following justification requirements must be observed.

Table 40: Justification requirements for deadline extensions and divergent management objectives pursuant to Sections 29 and 30 of the Federal Water Act

Section 29 WHG: Deadlines for achieving management objectives
(2) The competent authority may extend the deadline in subsection 1 if there is no further deterioration in the status of the water body and
1. the necessary improvements in the status of the water body cannot be achieved by the deadline

as a result of natural conditions,
2. technical implementation of the measures planned is only possible in stages over a long period or
3. compliance with the deadline would involve unreasonably high costs.

Section 30 WHG: Divergent management objectives

In derogation of Section 27, the competent authorities may lay down less stringent management objectives for certain surface water bodies if

1. the water bodies are so impaired by human activities or their natural conditions are such that the achievement of the objectives is impossible or would involve unreasonably high costs,
2. the ecological and socio-economic needs that are served by these human activities cannot be achieved by other means that would have considerably less adverse impacts on the environment and would not involve unreasonably high costs,
3. further impairment of the status of the water body is avoided, and
4. the best possible ecological status or ecological potential and the best possible chemical status are achieved having regard to the impacts on the properties of the water body that were unavoidable in view of the nature of the human activity.

Deadline extensions pursuant to Section 29 and divergent management objectives pursuant to Section 30 of the Federal Water Act must not permanently exclude or endanger the achievement of the management objectives set out in Sections 27, 44 and 47 (1) of the Federal Water Act in other water bodies within the same river basin unit.
The inventory updated in 2013 and the assessment have shown that there are a large number of significant pressures militating against achievement of the objectives. Reducing pollutant and nutrient inputs into surface water bodies and the groundwater, and improving water body structure, call for soundly based data acquisition and analysis and extensive financial and human resources for implementing the measures. The time taken from the first idea through local agreement to authorisation and implementation of the measures, and also progress control, often takes many years. In the case of groundwater, the long flow times from the surface of the soil into the groundwater and the resulting delay in the impact of the measures (several decades) are a particularly serious factor.

By identifying the pressures, assessing the risks and monitoring the process, it was possible to determine the action needed (cf. Chapters 2, 3 and 4) to achieve the objectives resulting from Sections 27 and 47 of the Federal Water Act and Article 4 of the WFD and compile the Lower Saxony contribution to the programmes of measures 2015 to 2021 for the Elbe, Weser, Ems and Rhine river basins.
These measures are being implemented on a step-by-step basis. This is due partly to the need to spread the costs of the measures, and partly to the administrative resources necessary to deal with the large number of measures. To keep this step-by-step implementation in line with the requirements of the directive, it is necessary for a large number of water bodies in all categories to make use of deadline extensions and also, to some extent, of divergent management objectives. A precondition for extensions of deadlines is that there is no further deterioration in the status of the water body.

Definition of diverging management objectives pursuant to Section 30 of the Federal Water Act can only be considered if, in addition to a large number of statutory conditions being satisfied, it is clear that the objectives cannot be achieved in practice. In view of the fact that the measurements are not sufficiently detailed in some cases and in view of the need to wait for the impacts of the measures implemented in the first management period, such a definition can only be undertaken in the present second management period, or even later in the third management period. In some cases the definition of divergent management objectives can be expected before the end of the second management period.
The deadline extensions which are primarily used in Lower Saxony are categorised on the basis of various grounds provided for in the Federal Water Act. Under Section 29 of the Federal Water Act, deadline extensions can be justified on the grounds of natural conditions, technical feasibility and unreasonably high cost. It is the joint understanding of the LAWA group of experts on economic analysis that further subdivision of the grounds is possible. This subdivision is not exhaustive (cf. Table 41).

Table 41: Non-exhaustive list of justifications for deadline extensions on the grounds of "natural conditions", Sections 29 (2) WHG and 47 (2) WHG, Art. 4 (4a) No. iii WFD

"Natural conditions"	**Sections 29 (2) No. 1 WHG and 47 (2) WHG Art. 4 (4a), No. iii WFD**
Temporal impact of measures planned or already implemented	- Long groundwater flow times - Time needed to eliminate phosphate nutrient load in an entire landscape
Duration of inherent dynamic development	- Time needed for ecological systems to react to measures
Other natural conditions	- Hydrogeological conditions
"Technical feasibility"	**Sections 29 (2) No. 2 WHG and 47 (2) WHG Art. 4 (4a), No. i WFD**
Reason for divergence not known	- Origin of substance pollution totally unknown - No explanation to date of divergent biological quality elements - Need for investigation to clarify relevance of different input paths / source sectors - Unclear interactions of different pressure factors on biological quality elements
Mandatory technical sequence of measures	- Need to draw up concepts for rainwater disposal - Preparation or updating of heat load plans - Combination of effective aquatic ecology measures with measures by other responsible bodies - Need for investigation and planning with regard to sediments and former mining activities
Duration of procedure not changeable	- Preparation of measures, planning of measures, tender procedures, authorisation procedures
Need for research and development	- Existing technologies are not sufficient to achieve the requirements relating to the water body (e.g. downward fish ladders) - Insufficient evidence of the effects of possible measures - Knowledge is not sufficient to permit appropriate management decisions

Other technical grounds	- Lack of space in narrow valleys (continuity) - Excessive height to be overcome (continuity) - Environmental quality standards cannot be achieved due to large proportion of wastewater
Massive unacceptable environmental impacts	- Risks to management objectives in other water bodies - More than temporary impairment of water body status - Obviously unacceptable environmental impact
Unreasonably high cost"	**Sections 29 (2) No. 3 WHG and 47 (2) WHG Art. 4 (4a), No. ii WFD**
Excessive burden on non-governmental cost units, need to spread costs over time	- Excessive burden of charges - Spreading for provision of public funding - Lack of alternative financing mechanisms
Excessive burden on governmental cost units, need to spread costs over time (disputed)	- Spreading for provision of public funding - Lack of alternative financing mechanisms - Incompatibility with other policy areas
Cost benefit analysis disproportionate ratio of costs to benefits	- Result of cost-benefit analysis - Defined cost effectiveness thresholds exceeded - Consideration of key/priority water body concept
Uncertainty about effectiveness of measures to achieve objectives	- Environmental quality standards not yet underpinned by scientific evidence (also classify under technical feasibility, if appropriate) - Methodological deficits (also classify under technical feasibility, if appropriate) - Compliance with environmental quality standard cannot be verified due to high detection limits (also classify under technical feasibility, if appropriate) - Uncertainty due to influence of weather on monitoring - Uncertainty regarding representativeness of measurement - Dependence on other measures
Limiting factors due to market mechanisms	- Land not available or only at unreasonably high cost - Capacity problems all lack of availability of qualified service providers for preparing the necessary technical plans (consultants, planning officers, engineering and construction services or other technical services)

Clear allocation is not always possible in the case of deadline extensions. In fact, different forms of justification may support or supplement each other.

The LAWA action recommendation for the justification of deadline extensions on the grounds of unreasonably high cost is currently being examined with a view to meaningful transferability to Lower Saxony (LAWA 2013f). During the last management plan cycle, Lower Saxony used multi-criteria analysis to test the methods of the "Leipzig approach" (ecologic: proportionality of costs of measures for the purposes of the Water Framework Directive) on two examples with regard to lack of proportion and divergent management objectives. The findings regarding the application limits resulted in Lower Saxony currently taking part in a LAWA research project to examine the disproportionality of costs. Together with the Helmholtz Centre for Environmental Research in Leipzig, and taking account of the

findings of previous studies, this is investigating ways of making targeted use of this justification.

As far as the use of deadline extensions on the basis of the individual water bodies is concerned, Lower Saxony is continuing to apply the two justifications of “technical feasibility” and “natural conditions”. Although the third justification of “unreasonably high cost” is described here, it cannot be used in view of the investigation currently in progress. At this point we provide below an overview of the reasons for selecting the individual criteria.

In Lower Saxony, the three justifications of “technical feasibility”, “unreasonably high cost” and “natural conditions” are based on the following situations:

1) Technical feasibility:

- Mandatory technical sequence of measures
- Duration of procedure not changeable: In view of the duration of the organisational preparations and implementation (planning, authorisation procedures etc.), it will only be possible to implement the necessary measures on a step-by-step basis, and it is expected that this implementation may not be completed until after the end of the second management cycle.

2) Unreasonably high cost:

- Uncertainty with regard to impacts: When it comes to the implementation of measures, some water bodies still do not have enough knowledge resulting from the inventory and/or the subsequent monitoring to permit a sufficiently accurate estimate of the success of a measure and its impact on the quality elements.
- Need to spread costs over time: Rough calculations show that compared with the use of funds in the water sector to date, there is a significantly greater need for finance in the coming management periods. Until all alternative sources of funds have been explored and can be excluded, it is first of all assumed that there will be a delay in achieving the objectives.
- Limiting factors in the sense of market mechanisms: implementation of a large proportion of measures is initially not possible, because of the limiting effect of external factors such as inadequate availability of land or lack of own financial resources. Furthermore, the implementation of the measures means an increased need for technical capacities and qualified service providers that cannot be met without delays.

3) Natural conditions:

- Temporal impact of measures planned or already implemented: in view of long reaction times (such as long flow times in the groundwater), it is to be expected that

some measures will not make their planned impacts felt until after the first management period.

- Duration of inherent dynamic development: in the case of some water bodies it is assumed that the time taken for the ecological systems to react to the measures taken will extend beyond the end of the first management cycle. Thus in many cases there will be a delay before measurement of the impacts of a measure is possible.

5.3.1 Objectives for surface water bodies

The key action areas in Lower Saxony in the second management period continue to focus on reducing diffuse pollution and restoring and improving continuity and hydromorphology. For surface waters this corresponds to the questions developed at national level in the four river basins.

Water body specific preparation of deadline extensions in Lower Saxony with regard to good ecological status/potential takes place in a multistage selection process. The first step is to identify all surface water bodies that possess good status or good ecological potential. No deadline extensions are claimed for these. Here it makes no difference whether they are natural, artificial or heavily modified water bodies.

For all other water bodies, deadline extensions are planned on the grounds of technical feasibility or natural conditions (cf. Table 41). As a rule, clear assignment of a single justification to a water body is not possible.

Deadline extensions due to failure to achieve good chemical status are claimed for all water bodies with a chemical status that is “not good”, and justified exclusively on the grounds of technical feasibility. This procedure has been agreed for the whole of Germany, and is the consequence of the nationwide failure to achieve the environmental quality standard for mercury in biota.

Table 42 shows the number of surface water bodies for which Lower Saxony intends to claim extensions of the deadline. The measures for the second management planning cycle are based on the 2009 programme of measures and will probably be continued in the third management planning cycle as well. New developments or requirements will be taken into account.

Table 42: Deadline extensions pursuant to Section 29 WHG and Article 4 (4) WFD for surface water bodies (SWBs)

Deadline extensions on the grounds of failure to achieve good ecological status or good ecological potential				
	Number of SWBs	**Number of SWBs to which the grounds apply**		
		1) Technical feasibility	**2) Unreasonably high cost**	**3) Natural conditions**
Flowing waters	1,498	1,498	-	1,498
Standing waters	18	18	-	18
Transitional waters	3	3	-	3
Coastal waters	10	10	-	10
Deadline extensions on the grounds of failure to achieve good chemical status				
	Number of SWBs	**Number of SWBs to which the grounds apply**		
		1) Technical feasibility	**2) Unreasonably high cost**	**3) Natural conditions**
Flowing waters	1,562	1,562	-	-
Standing waters	27	27	-	-
Transitional waters	3	3	-	-
Coastal waters	13	13	-	-

The rivers originating in the Harz are heavily polluted as a result of mining activities down the centuries. Apart from the heavy metals transported in the dissolved phase, the water meadows constitute a very large reservoir of pollutants because of their contaminated sediments. The main reasons for contamination of the waters in the Harz mountains and foothills are the former mining sites (tip heaps and boundary sites) which were established beside the waters because of their water and energy requirements. In historical times the wastewater and processing residues were discharged into the receiving waters. Furthermore, seepage water contaminated with lead, cadmium and mercury from the tip heaps and foundry sites was and is transported into surface waters via the near-surface groundwater. In view of these pressures, divergent management objectives were laid down for 62 water bodies in accordance with Section 30 of the Federal Water Act (cf. Table 43 and Chapter 4.2.3).

Table 43: Divergent management objectives pursuant to Section 30 WHG and Article 4 (5) WFD for surface water bodies (SWBs)

Divergent management objectives on the grounds of failure to achieve good chemical status			
	Number of SWBs	Number of SWBs to which the grounds apply	
		1) Technical feasibility	2) Unreasonably high cost
Flowing waters	61	61	-

Table 97 in Appendix A-4 lists the surface waters for which divergent management objectives have been decided.

Development of Outer Weser and Lower Weser

The plan approval decision of 15.07.2011 (P-143.3/75 and 77) by the Northwestern Waterways and Shipping Directorate (WSD) approved relevant applications by Lower Saxony and Bremen for the development of the Outer Weser and Lower Weser. The plan approval decision takes the precaution of permitting an exception to the management objectives within the meaning of Section 31 (2) Alternative 2 WHG (page 1,273 of the above-mentioned plan approval decision). The verification of compatibility with the requirements of the WFD and the exception to the management objectives relates to the water bodies: Weser/tidal zone above Brake (26035), transitional waters of the Weser (T1.4000.01), open coastal waters of the Weser (N3_4900_01), western Wadden Sea of the Weser (N4_4900_01), Ochtum tidal zone (23001), Lesum and Hamme (24007), Wörpe II (24049), Hunte tidal zone (25073), Geeste (26064), Wümme Südarm (24005), Wümme V (24006), Wümme-Mittelarm (24043) and Wümme-Nordarm II (24038). The three development projects are described in the plan approval decision on page 85 ff. (development of Outer Weser from the sea to Bremerhaven) and page 89 ff. (development of Outer Weser from Bremerhaven to Brake and from Brake to Bremen). The development of the Outer Weser relates to the section extending seawards from Weser-km 65 near Bremerhaven to Weser-km 130. The fairway is to be deepened in this section so that container vessels with a maximum loaded draught of 13.5 m can call at the container port of Bremerhaven irrespective of the tide. To improve the conditions for two-way traffic involving large vessels, the fairway is also to be widened at certain points. The existing turning point at the container port is also to be deepened accordingly. The development of the Lower Weser relates in part to the section extending up river from Bremerhaven (kilometre 65) to Brake (kilometre 40). In this section the fairway is to be deepened so that bulk goods vessels with a maximum loaded draught of 12.8 m can call at the port of Brake irrespective of the tide. Moreover, the section of the Lower Weser extending up river from Brake to Bremen (between kilometres 40 and 8) is also to be developed. Here there are plans to dredge out the fairway so that bulk goods vessels with a loaded draft of up to 11.1 m can call at the port of Bremen irrespective of the tide.

The project involves lasting changes in water body structure in the tidal zone of the Weser. These and other impacts of the water bodies mentioned are described in detail on page 1,267 ff. and page 217 ff. of the plan approval decision. The reasons for the development projects, which are of overriding public interest within the meaning of Section 31 (2) sentence 1 No. 2 of the Federal Water Act, are described in detail for the development of the Outer Weser on page 1,273 in conjunction with page 119 ff., and for the development of the Lower Weser from Bremerhaven to Brake and from Brake to Bremen in conjunction with page 163 ff. of the plan approval decision of 15.07.2011. All three projects are largely justified by a considerable transport-related need for vessels of greater loaded draught to be able to navigate the Weser as part of the “Trans-European Transport Network”. Furthermore, the projects are associated with considerable positive impacts on regional economic structure and the labour market, and will promote shipping as an eco-friendly means of transport.
There are no other suitable means of achieving the projects’ objectives that have substantially lower adverse effects on the environment, are technically feasible and do not involve unreasonably high cost (page 1,273 in conjunction with page 146 ff. and page 187 ff. of the plan approval decision of 15.07.2011). The plan approval decision provides for extensive measures to reduce the adverse effects on water body status or compensate for unavoidable deterioration. In this connection, reference is made to page 455 ff. and page 603 ff. of the decision.
At present the enforceability of the plan approval decision is limited because of various legal actions. In view of an informative decision by the Federal Administrative Court, the Federal Waterways and Shipping Directorate is currently working to supplement the contested plan approval decision.

Development of the Outer Ems

In response to an application by Lower Saxony, the Federal Waterways and Shipping Directorate is planning to develop the fairway of the Outer Ems. As part of the necessary authorisation procedure under public law, compliance with the requirements resulting from the WFD is to be verified.

Modification of the fairway of the Lower and Outer Elbe

Until 2015, no use was made for surface water bodies of exceptions on the grounds of temporary impairment or exceptions on the grounds of fresh changes in the properties of water bodies or fresh and lasting anthropogenic development activities pursuant to Section 31 (2) (or Section 31 (1)) of the Federal Water Act in the German part of the Elbe river basin. However, the existing management plan does not rule out the possibility of using such exceptions in the future. Whether the exceptions can be used in individual cases, i.e. whether the conditions are satisfied, must be examined and decided by the competent authority in the context of the relevant authorisation procedure.
In the case of water bodies DEHH_el_01, DEHH_el_02, DESH_el_03, DESH_T1.5000.01 and N3.5000.04.01, precautionary exceptions were granted in respect of the modification of

the fairway of the Lower and Outer Elbe under supplementary planning decisions dated 01.10.2013 . The supplementary planning decisions are not yet enforceable because a case currently before the courts means that the relevant authorisation procedures have yet to be finally completed. In the end it may not be necessary to take advantage of the exceptions granted. It must however be assumed that enforceable approval of the fairway modifications will be granted during the management period of this management plan, and that the exceptions granted may also be necessary for this purpose.
Details of the project can be found in the plan approval decisions of 23.04.2012, together with the supplementary planning decisions of 01.10.2013 and the planning documents (www.fahrrinnenausbau.de). If advantage is taken of an exception to the ban on deterioration, all suitable practical precautions must be taken in accordance with Section 31 (2) WHG (Art. 4 (7) WFD) to minimise the adverse effects on the status of the water body. In the context of the project, these precautions are considered in relation to the elements that might be affected by any deterioration. If the precautions laid down in the project approval have an influence on the programme of measures, they will subsequently be implemented and published as additional measures pursuant to Section 82 (5) WHG (Art. 11 (5) WFD). A detailed description of the additional measures will be provided in the report on progress with the implementation of the programme of measures in December 2018. The third management plan in December 2021 will include a summary report on additional measures implemented during the period 2016 to 2021.

Offshore terminal Bremerhaven

The offshore terminal is to be constructed between approximately km 64 and 65 of the Lower Weser, in the Blexer Bogen area in the south of Bremerhaven. It will serve as a heavy load, assembly and transshipment facility for wind power systems and elements. The implementation of the project is tied to a large number of authorisation decisions under public law. Some already exist and some are expected before the end of 2015.
A precautionary exception pursuant to Section 31 (2) WHG is currently being examined as part of the water body development project for the “transitional waters of the Weser” (T1.4000.01). The key aspect of the possible changes lies in the loss of tidal flats and shallow water areas due to temporary use of land during the construction period and permanent use of land after construction of the terminal (approximately 25 hectares). There will also be changes in the composition of sediments in the access and mooring berth area, and changes in sediment structure and substance inputs as a result of the necessary dumping of material during the construction period. Furthermore, encroachments on the morphology of the water body will take place as a result of the necessary maintenance dredging in the project zone even after the construction work is completed. It must however be assumed that enforceable approval of the project will be granted in November 2015, and an exception may also be necessary for this purpose. Details of the project can be seen from the application documents for plan approval of the project.
The project is justified on the grounds of overriding public interests. The purpose of the project is sustainable development of the economic region of Bremerhaven and the ecological energy transition (see application documents for Offshore Terminal Bremerhaven). The central precondition for this was and still is the extensive creation of a specific

infrastructure needed for the development of the technology-intensive offshore wind power industry and also the production and shipment of its products.
The project also involves the implementation of measures to substantially reduce (in other words practically eliminate) the adverse effects on the status of the water body. The planning objective of developing the regional economic area for the wind power industry cannot be achieved by other suitable means.

5.3.2 Objectives for groundwater bodies

The objectives for groundwater are, in addition to the ban on deterioration, not only good quantitative and chemical status, but also the reversal of rising trends in pollutant concentrations.

For selected groundwater bodies it is necessary to claim deadline extensions on the grounds of bad chemical status (cf. Table 44). For these groundwater bodies an extension of deadline is claimed on the grounds of natural conditions which rule out timely improvements in status (Section 47 in conjunction with Section 29 (2) to (4) WHG, Article 4 (4-3) WFD). This is connected with the fact that simply because of natural flow times it may take years or decades before any change can be detected in the status of the groundwater bodies as a result of the measures. Furthermore, the deadline extension for groundwater bodies that fail to achieve good status because of contamination with metals and/or crop protection agents is necessary in view of the technical implementation of measures (research and development, mandatory technical sequences of measures, time-based effects of measures already taken, e.g. ban on active ingredients of crop protection agents). For groundwater bodies for which a deadline extension has been obtained, uncertainty factors make it impossible as yet to determine when such bodies will achieve the objective of good status. The measures for the second management planning cycle are based on the 2009 programme of measures and will probably be continued in the third management planning cycle as well. Especially in view of the long periods needed for the measures to make themselves felt in the groundwater, continuity in the planning of measures is important. New developments or requirements will be taken into account.
No divergent management objectives are claimed for the groundwater bodies in Lower Saxony.

Table 44: Deadline extensions pursuant to Section 47 in conjunction with Section 29 (2) to (4) WHG and Article 4 (4) WFD for groundwater bodies (multiple entries are possible)

Deadline extensions on the grounds of failure to achieve good chemical status			
Number of GWBs	Number of GWBs to which the grounds apply		
	1) Technical feasibility	2) Unreasonably high cost	3) Natural conditions
44	18	-	43

Table 103 in Appendix B-3 lists all groundwater bodies including the deadline extensions.

5.4 Environmental objectives in protected areas

The protected areas designated in Lower Saxony for which there is a special need to protect the surface waters and groundwater or to conserve water-dependent habitats and species are listed in Chapter 1.4. Monitoring of the protected areas is in accordance with the requirements of the relevant EC directives.

According to Section 29 (4) of the Federal Water Act and Article 4 (1c) of the Framework Water Directive in conjunction with Annex IV, the protected areas are to achieve all standards and objectives of the WFD by 2015, or at the latest by 2027, except as otherwise provided by the statutory requirements which formed the basis for designating the individual protected areas. The management of surface water bodies and groundwater bodies located in protected areas therefore has to take account of the objectives resulting from the relevant legal provisions, such as protected area ordinances.

Implementation of the objectives is prescribed in the protected areas, except as otherwise provided by the statutory requirements under which the protected areas were designated. In many cases the objectives are the same. In individual cases where conflicts of objectives occur, it is necessary to weigh up the relative merits of the individual objectives. For all types of protected areas, the measures planning process always involves checking whether the objectives specific to the individual protected areas are in line with the management objectives of the WFD and what synergies exist with other protection objectives. Deadline extensions and divergent management objectives are possible.

6 Summary of economic analysis of water use

6.1 Economic significance of water uses

6.1.1 Introduction

As part of the inventory pursuant to Section 12 of the Surface Waters Ordinance and Section 14 of the Groundwater Ordinance, or Article 5 and Annex III of the FWD, it is necessary to update the economic analysis of water use at river basin level.

The economic analysis is intended to support the planning of effective programmes of measures that are appropriate to the causes, taking account of the economic background to the present uses and contamination of the water bodies. For the first update of the economic analysis in 2013, the Joint Water Commission of the Federal States (LAWA-AO) prepared an action recommendation to ensure a standardised description of the analytical results (LAWA 2012g). In addition to a model classification, this harmonised data preparation for all federal states by including only water management issues of relevance to the directive and defining a standard reference year of 2010 for the data.

The main data sources used were the data of the official water and wastewater statistics (2013) as of 30.06.2010 and 31.12.2010 (economic statistics) and the data of the agricultural census 2010. The report on wastewater disposal issues also included data from the management report (MU NI 2013). The standardised reference year used for the data in the economic analysis was 2010, as far as this was possible in view of data availability and except otherwise stated.

The WFD basically places the focus on river basin units (RBUs). Thus the WFD concentrates on the hydrological situation and disregards the existing political and administrative boundaries. To ensure nationwide harmonisation of the data, a method was therefore developed that permitted standardised combination of the statistical data (which in general were originally based on administrative boundaries) with hydrological land units (use of “qualified control bands”). As a result, the various data (population figures, areas etc.) for a community whose area extends across different river basin units can be assigned to these RBUs. The status of the control band for the RBU is 31.12.2010. The combination of the statistical data was handled on a central basis for all federal states by the Baden-Württemberg Statistical Office and the resulting dataset was subsequently made available to the federal states (Statistische Landesämter 2013).

In accordance with the LAWA action recommendation, the economic analysis describes the water uses by using macroeconomic indicators to identify the socio-economic framework conditions. It also analyses the nature and scale of water uses.

These relate to water extraction by public and non-public water suppliers, water supplies to final consumers by public water suppliers, use of water by branches of industry, irrigation of agricultural land, public-sector wastewater treatment, wastewater discharges by public and non-public installations, existing wastewater disposal facilities, proven wastewater loads,

water and wastewater charges, and investment in environmental protection by the manufacturing sector. Other issues considered are hydro power, heat power, inland shipping and flood control.
In each case, the data sources used are stated in the following table.

6.1.2 Description of economic importance of water uses

6.1.2.1 Description of updated macroeconomic indicators

Population and land area, gainfully employed persons, gross value added

Lower Saxony is the second-largest federal state in terms of area. it has a population of nearly 8 million, 66% of whom live in the Weser River basin unit. The Weser RBU, with 58%, covers the largest share of the area of Lower Saxony, followed by the Ems RBU with approximately 21% and the Elbe RBU with nearly 19%. The Rhine RBU accounts for only a very small percentage of the area of Lower Saxony. The macroeconomic indicators for Lower Saxony's river basin units are summarised in Table 45.

Table 45: Macroeconomic indicators in Lower Saxony RBUs in 2010

Indicator	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Population	Number	7,918,293	142,063	1,518,797	5,257,267	1,000,166
Total area (land area)	km²	47,613	1,056	9,885	27,651	9,021
Forest areas	km²	10,339	169	1,224	6,719	2,227
Population density in RBUs in NI	**[E/km²]**	**166**	**135**	**154**	**190**	**111**
Total gainfully employed	Number (thousands)	3,704	68.4	745	2,502	389
of which: services sector	Number (thousands)	2,727	45.4	508	1,881	292
of which: manufacturing sector	Number (thousands)	879	20.4	206	574	79
of which: agriculture and forestry, fisheries	Number (thousands)	99	2.6	31	47	18
Gainfully employed in % of population	**%**	**46.8**	**48.2**	**49.1**	**47.6**	**38.9**
GDP – Gross domestic product	in '000 EUR	214,922,497	3,352,505	42,015,449	148,998,827	20,555,716
Gross value added	%	89.5	89.5	89.5	89.5	89.5
Gross value added	in '000 EUR	192,362,059	3,000,592	37,605,082	133,358,404	18,397,981
Services sector	in '000 EUR	131,149,652	1,834,877	24,621,496	90,932,015	13,761,264
Manufacturing sector	in '000 EUR	58,232,546	1,061,874	12,035,728	41,008,718	4,126,226

Indicator	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Agriculture, forestry and fisheries	in '000 EUR	2,979,858	103,841	947,857	1,417,668	510,492
Source: State Statistical Offices 2013 (Table NI_FGE_VGR_Bev_Fläche.csv)						

6.1.3 Updated description of nature and scale of water services

6.1.3.1 Economic importance of water uses

In Lower Saxony some 270 public water supply enterprises provide the population with drinking water, 86% of which is extracted from the groundwater. The greater part of this drinking water is used and distributed within Lower Saxony. The population's average connection rate to the public water supply is 99.4%. The indicators for the public water supply are summarised in the following tables (Table 46 to Table 50).
Non-public water suppliers are dealt with separately in Section 6.2.3.1.

Table 46: Public water supplies in Lower Saxony RBUs in 2010 – water supply companies and extraction

Public water supply [1] in 2010	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Analysis based on registered office of supply company						
Water supply companies	**Number**	**269**	**4**	**48**	**182**	**35**
Total water extraction [2]	**'000 m³**	**537,515**	**10,684**	**74,668**	**391,666**	**60,497**
from groundwater	%	85.9	99.9	99.5	81.0	98.9
from spring water	%	1.8	0.1	0.5	2.3	0.7
from bank filtrate	%	0.0	–	–	0.1	–
from recharged groundwater	%	0.4	–	–	0.6	–
from lakes and reservoirs	%	11.7	–	–	16.0	0.4
from river water	%	0.1	–	–	0.1	–
from groundwater	'000 m³	461,991	10,675	74,300	317,180	59,836
from spring water	'000 m³	9,703	9	368	8,932	394
from bank filtrate	'000 m³	221	–	–	221	–
from recharged groundwater	'000 m³	2,293	–	–	2,293	–
from lakes and reservoirs	'000 m³	63,001	–	–	62,734	267
from river water	'000 m³	306	–	–	306	–
Analysis based on site of extraction facility						
Water extraction facilities	**Number**	**646**	**7**	**105**	**446**	**88**
Total water extraction [2]	**'000 m³**	**537,286**	**8,991**	**118,313**	**343,973**	**66,009**
from groundwater	%	85.9	99.7	99.7	78.4	98.5
from spring water	%	1.8	0.3	0.3	2.5	0.9

Public water supply [1] in 2010	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
from bank filtrate	%	0.0	–	–	0.1	–
from recharged groundwater	%	0.4	–	–	0.7	–
from lakes and reservoirs	%	11.7	–	–	18.2	0.4
from river water	%	0.1	–	–	0.1	0.1
from groundwater	’000 m³	461,762	8,982	117,945	269,799	65,036
from spring water	’000 m³	9,703	9	368	8,699	627
from bank filtrate	’000 m³	221	–	–	221	–
from recharged groundwater	’000 m³	2,293	–	–	2,293	–
from lakes and reservoirs	’000 m³	63,001	–	–	62,734	267
from river water	’000 m³	306	–	–	227	79

1) Analysis based on qualified control band: In some cases the combination of the statistical data with hydrological land units results in a division into two or more RBUs and hence in non-integer results, which are rounded here.
2) Definition of water types according to Federal Statistical Office
Source: State Statistical Offices 2013 (Table NI_FGE_Sitz_WVU; Table NI_FGE_Anlage.csv)

Table 47: External purchases by public water suppliers in Lower Saxony RBUs in 2010

Public water supply [1] in 2010 – external purchases	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Total external purchases	’000 m³	**138,548**	**6,509**	**6,509**	**120,651**	**4,879**
from other public water suppliers within Lower Saxony	’000 m³	120,983	385	5,783	109,975	4,840
from industrial companies within Lower Saxony	’000 m³	10,353	2	101	10,250	–
from other federal states	’000 m³	1,090	–	625	426	39
from other countries	’000 m³	–	–	–	–	–

[1] Analysis based on qualified control band: In some cases the combination of the statistical data with hydrological land units results in a division into two or more RBUs and hence in non-integer results, which are rounded here.
Source: State Statistical Offices 2013 (Table NI_FGE_Sitz_WVU; Table NI_FGE_Anlage.csv)

Table 48: Public water supplies in Lower Saxony RBUs in 2010 – water supply to final consumers

Public water supply – water supply to final consumers [1)] in 2010	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Analysis based on registered office of supply company						
Number of people directly supplied within Lower Saxony	Number	7,871,038	142,443	1,021,449	5,795,118	912,028
Total water supply to final consumers	'000 m³	460,573	8,089	68,933	329,288	54,263
of which: households and small consumers	'000 m³	362,865	5,917	50,452	263,470	43,026
of which: commercial and other customers (differential calculation)	'000 m³	97,708	2,172	18,481	65,818	11,237
Total water supply to final consumers	l / (E*d)		156	185	156	163
Analysis based on community supplied						
Number of people directly supplied within Lower Saxony	Number	7,868,998	140,612	1,500,363	5,238,329	989,694
Total water supply to final consumers (within Lower Saxony)	'000 m³	460,488	7,998	100,018	292,685	59,787
of which: households and small consumers	'000 m³	362,779	5,871	69,880	238,942	48,086
of which: commercial and other customers (differential calculation)	'000 m³	97,709	2,127	30,138	53,743	11,701

[1)] Final consumers are private households, commercial enterprises and other customers which the public water supply companies charge directly for the water quantities supplied.
Source: State Statistical Offices 2013 (Table NI_FGE_Sitz_WVU; Table NI_FGE_versGemeinde.csv)

Table 49: Public water supplies in Lower Saxony RBUs in 2010 – water supply for further distribution, internal consumption by waterworks

Public water supply 2010 – further distribution, own consumption, losses	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Water supply for further distribution, totals	'000 m³	160,987	2,278	6,245	146,970	5,494
to other public water suppliers within Lower Saxony	'000 m³	120,784	385	5,376	110,008	5,015
to other distributors within Lower Saxony	'000 m³	10,260	0	49	9,901	310
to other federal states	'000 m³	28,050	0	820	27,061	169
to other countries	'000 m³	1,893	1,893	0	0	0
internal consumption by waterworks	'000 m³	18,181	394	2,738	13,326	1,723
water losses / measuring differences, positive	'000 m³	30,200	310	3,261	22,733	3,896
water losses / measuring differences, positive	%	4.7	2.9	4.2	4.6	6.3

Source: State Statistical Offices 2013 (Table NI _FGE_Sitz_WVU.csv)

Table 50: Public water supplies in Lower Saxony RBUs in 2010 – Connection situation

Public water supply connection situation in 2010	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Total population	Number	7,932,282	142,163	1,521,665	5,268,336	1,000,118
Number of people not connected to a public water supply (by place of residence)	Number	48,158	1,552	21,302	20,680	4,624
connected inhabitants (by place of residence), differential calculation	Number	7,884,124	140,611	1,500,363	5,247,656	995,494
connected inhabitants (by place of residence)	%	99.4	98.9	98.6	99.6	99.5
Source: State Statistical Offices 2013 (Table NI_EWAnschluss_FGE.csv)						

Water charges

Drinking water charges for private households and small businesses

The charges for drinking water are strongly influenced by regional conditions and may differ from one community to another. As a rule, the drinking water charge consists of a consumption-related component and a component not related to consumption (basic charge). Table 51 shows the population-weighted mean values of the two individual components for the four RBUs in Lower Saxony, and also their ranges. It should be noted that simple addition of the minimum and maximum values does not reflect real price levels.

Table 51: Range of drinking water charges in Lower Saxony RBUs in 2010

Drinking water charges in 2010	Unit	Range RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Consumption price per m³ mean consumption price	EUR/m³	0.92 to 1.35	1.12	0.92	1.35	0.93
Basic charge (usual charge independent of consumption) per annum	EUR/a	40.0 to 49.9	40.0	49.2	49.9	45.0
Source: State Statistical Offices 2013 (Table NI _FGE_Entgelte_2010.csv)						

Water abstraction charge

In Lower Saxony a charge is made for the abstraction of water from surface waters and aquifers under Section 21 of the Lower Saxony Water Act of 2010 for certain uses of water. The size of the water abstraction charge is based on the individual water use.

6.1.3.2 Economic importance of wastewater discharges

Public wastewater disposal

The public wastewater disposal system is a water service with the function of wastewater removal and treatment. It is a public interest service, permits commercial activities and has a positive impact on water conservation.
Every two years, Lower Saxony submits a situation report to the EU on the disposal of municipal wastewater and sewage sludge, as required by Article 16 of the EU directive (Urban Wastewater Directive). For the purpose of the economic analysis, the data on public wastewater disposal are taken from the situation report 2013. The data on wastewater treatment originate from 2011.
To satisfy the criterion of largely standardised nationwide data in accordance with the LAWA guideline (LAWA 2012g), the data from the Lower Saxony situation report are supplemented by the centrally harmonised data, especially in cases where the allocation of the data to a specific river basin is not evident from the situation report. The combination of the data (cf. Chapter 6.1) may give rise to slight deviations in the statistical data, but these are negligible for the purposes of the economic analysis.

Public sewage works

In 2010, 94.4% of the nearly 8 million inhabitants of Lower Saxony were connected to the public sewerage system and to municipal wastewater treatment plants, all of which had both a mechanical and a biological purification stage. Some 445,000 inhabitants disposed of their wastewater by means of small sewage plants.
According to the situation report, there were 452 municipal sewage plants in Lower Saxony in 2010 with a treatment capacity of 2,000 population equivalents and a total development size of 15.1 million population equivalents (MU NI 2013). The total of all public sewage plants, however, came to 634 (LSKN 2010, Statistische Landesämter 2013). The indicators for public wastewater treatment for the individual river basin units in Lower Saxony are summarised in Table 52.

Table 52: Indicators for public wastewater treatment in Lower Saxony RBUs in 2010

Public sewage plants in 2010 (based on location of plant)	**Unit**	**Total RBU NI**	**RBU Rhine**	**RBU Ems**	**RBU Weser**	**RBU Elbe**
Total public sewage plants	Number	634	10	124	402	98
Mechanical sewage plants	Number	0	0	0	0	0
Biological sewage plants	Number	634	10	124	402	98
Inhabitants connected (E)	Number	7,265,911	118,265	1,346,902	4,976,299	824,445
Mean annual population equivalents connected (EW)	Number	11,880,723	247,054	2,573,243	7,536,682	1,523,744
Developed size	Inhabitants	15,211,828	361,735	3,283,615	9,536,956	2,029,522
Total quantity of	'000 m³	611,503	7,957	106,669	437,137	59,740

Public sewage plants in 2010 (based on location of plant)	**Unit**	**Total RBU NI**	**RBU Rhine**	**RBU Ems**	**RBU Weser**	**RBU Elbe**
wastewater treated						
Domestic and commercial foul water	'000 m³	454,860	6,877	93,294	304,401	50,288
External water	'000 m³	120,300	1,010	11,841	99,616	7,833
Rainwater	'000 m³	36,342	69	1,534	33,120	1,619
Wastewater volume treated in mechanical sewage plants	'000 m³	0	0	0	0	0
Domestic and commercial foul water	'000 m³	0	0	0	0	0
External water	'000 m³	0	0	0	0	0
Rainwater	'000 m³	0	0	0	0	0
Wastewater volume treated in biological sewage plants	'000 m³	611,503	7,957	106,669	437,137	59,740
Domestic and commercial foul water	'000 m³	454,860	6,877	93,294	304,401	50,288
External water	'000 m³	120,300	1,010	11,841	99,616	7,833
Rainwater	'000 m³	36,342	69	1,534	33,120	1,619
Direct discharges of wastewater						
Foul water for direct discharge [1)]	'000 m³	24	2	3	13	6

[1)] Foul water discharged directly into a surface water or the subsoil via the combined sewer system without being treated in a central wastewater treatment plant.

Source: LSKN 2010 or subdivision by RBUs in accordance with Statistische Landesämter 2013 (Table NI_FGE_ABA_alle.csv, Table NI_FGE_ABA_mech.csv, Table NI_FGE_ABA_bio.csv,Table NI_ Direkt_FGE)

Loads in the course of the system

The nationwide minimum requirements for discharges from municipal sewage plants laid down in Annex 1 to the Wastewater Ordinance. In Lower Saxony all municipal sewage plants with a developed size of 2,000 population equivalents or more achieve a load reduction of 96% for chemical oxygen demand (COD), 94.6% for total phosphate and 91.5% for total nitrate (MU NI 2013). For the Lower Saxony catchment areas and the North Sea, Table 53 shows differentiated figures for the load reductions in municipal sewage plants and the discharge loads from such plants.

Table 53: Load reductions in municipal sewage plants in Lower Saxony and North Sea RBUs (MU NI 2013)

Load reductions in municipal sewage plants	Unit	RBU Rhine (Vechte)	RBU Ems	RBU Weser	RBU Elbe	North Sea
Input load N_{total}	t/d	1.5	19.4	67.8	10.9	1.9
Output load N_{total}	t/d	0.2	1.5	5.9	0.9	0.1
Degradation N_{total}	%	87.2	92.2	91.2	91.6	95.1
Input load COD	t/d	16.8	238.1	884.8	158.1	18.7
Output load COD	t/d	1.1	10.9	34.6	5.9	1.0
Degradation COD	%	93.2	95.4	96.1	96.3	94.5
Input load P_{total}	t/d	0.26	3.75	13.09	2.16	0.33
Output load P_{total}	t/d	0.02	0.18	0.72	0.11	0.03
Degradation P_{total}	%	94.0	95.1	94.0	95.0	91.5
Source: Wastewater situation report Lower Saxony (MU NI 2013)						

Table 54: Connection to public wastewater disposal in Lower Saxony RBUs in 2010

Connection to public wastewater disposal in 2010 (analysis based on place of residence)	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Population equivalents in RBU	Number	7,932,282	142,163	1,521,665	5,268,336	1,000,118
Inhabitants connected to public sewerage system	Number	7,487,258	127,145	1,350,170	5,098,859	911,084
Inhabitants connected to a sewage plant	Number	7,486,502	127,100	1,350,134	5,098,491	910,777
Inhabitants not connected to a sewage plant	Number	756	45	36	368	307
Inhabitants connected to public sewerage system	%	94.4	89.4	88.7	96.8	91.1
Inhabitants connected to a sewage plant	%	94.4	89.4	88.7	96.8	91.1
Inhabitants not connected to a sewage plant	%		0.0	0.0	0.0	0.0
Inhabitants not connected to public sewerage system	Number	445,024	15,018	171,495	169,477	89,034
of which: inhabitants connected to a small sewage plant	Number	437,607				
of which: inhabitants connected to an undrained cesspit	Number	7,418				
Source: State Statistical Offices 2013 (Table NI_EWAnschluss_FGE.csv, LSKN 2010)						

Length of public sewerage system

In Lower Saxony drainage is largely in separate systems, in other words domestic foul water and collected rainwater are disposed of in separate sewers. The indicators for public sewerage systems, i.e. sewer lengths and relief structures, are shown in the following Tables 55 and 56.

Table 55: Indicators for public sewerage systems in Lower Saxony RBUs in 2010

Length of public sewerage systems in 2010		Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Sewer network – Total length	km	77,678	1,521	15,424	50,404	10,329
Combined sewers	km	3,339	59	165	2,884	231
Foul water sewers	km	45,909	980	9,886	28,644	6,398
Rainwater sewers	km	28,431	482	5,373	18,876	3,700
Inhabitants connected to public sewerage system	Number	7,487,258	127,145	1,350,170	5,098,859	911,084
Total sewer length per inhabitant connected	m/E	10	12	11	10	11

Source: LSKN 2013 or subdivision by RBUs in accordance with Statistische Landesämter 2013 (Table NI_Entsorgungsgebiet_FGE.csv, Tab.NI_EW-Anschluss.csv)

Table 56: Indicators for rainwater relief systems in Lower Saxony RBUs in 2010

Rainwater relief systems in 2010	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Rainwater basin	Number	144	1	3	137	3
Rainwater overflow basins, volume	m³	262,909	1,800	720	253,604	6,785
Rainwater retention basins	Number	4,239	70	1,051	2,453	665
Rainwater retention basins, volume	m³	10,408,472	141,885	2,951,247	6,040,452	1,274,888
Rainwater clearing tanks	Number	89	2	17	60	10
Rainwater clearing tanks, volume	m³	106,129	300	17,502	78,802	9,525
Rainwater overflows without basin	Number	550	0	6	525	19

Source: State Statistical Offices 2013 (Table NI_Entsorgungsgebiet_FGE.csv)

Wastewater charges

A charge is made for the disposal of wastewater. As a rule this consists of a volume-related component for foul water and rainwater, and a basic component which is independent of volume. The structure of these charges may differ from one community to another. The population-weighted mean values and ranges stated in Table 57 for the RBUs in Lower Saxony do not take account of any special features in individual charge structures. It should be noted that simple addition of the minimum and maximum values does not reflect real price levels.

Table 57: Wastewater charges in Lower Saxony RBUs in 2010

Wastewater charges in 2010	Unit	Range RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Wastewater or foul water charge	EUR/m³	2.01 to 2.5	2.50	2.01	2.38	2.17
Rainwater charge	EUR/m³	0.13 to 0.28	0.26	0.21	0.28	0.13
Usual household charge, independent of volume and area	EUR/a	8.86 to 19.45	19.45	15.04	8.86	9.78

Source: State Statistical Offices 2013 (Table NI_FGE_Entgelte_2010.csv)

6.1.4 Updated description of importance of other water uses

6.1.4.1 Non-public water supply

Industry has a high level of internal supplies of process water. The greater part of water abstraction for internal purposes is in the manufacturing sector. In Lower Saxony there are also irrigation associations that supply most of the water for irrigation in the agricultural sector. Irrigation associations in Lower Saxony are mostly assigned to the agricultural sector, but in isolated cases they may belong to the services sector. The results of the special statistical analysis of water abstraction by the irrigation associations are therefore largely a sub-item in the agricultural sector and only to a small extent a sub-item in the services sector. The indicators for non-public water supply are summarised in Tables 58 and 59.

Table 58: Own water abstraction for non-public water supplies in Lower Saxony RBUs in 2010

Own water abstraction 2010 (by company location)	**Unit**	**Total RBU NI**	**RBU Rhine**	**RBU Ems**	**RBU Weser**	**RBU Elbe**
Agriculture and silviculture	**'000 m³**	**106,110**	**no data**	**621**	**50,103**	**55,386**
Groundwater	'000 m³	95,250	no data	420	47,211	47,619
Spring water	'000 m³	0	no data	0	0	0
Bank filtrate	'000 m³	0	no data	0	0	0
Recharged groundwater	'000 m³	0	no data	0	0	0
from rivers, lakes and reservoirs	'000 m³	10,860	no data	201	2,892	7,767
Manufacturing sector	**'000 m³**	**3,459,434**	**2,330**	**92,124**	**3,150,408**	**214,572**
Groundwater	'000 m³	105,831	1,866	25,149	62,645	16,171
Spring water	'000 m³	5,001	0	41	4,853	107
Bank filtrate	'000 m³	4,543	0	8	4,535	0
Recharged groundwater	'000 m³	750	0	0	750	0
from rivers, lakes and reservoirs	'000 m³	3,343,309	464	66,927	3,077,625	198,294
of which: Energy supply*	**'000 m³**	**3,046,177**	**311**	**53,764**	**2,985,866**	**6,236**
Groundwater	'000 m³	6,769	2	291	238	6,236
Spring water	'000 m³	0	0	0	0	0
Bank filtrate	'000 m³	1,999	0	0	1,999	0
Recharged groundwater	'000 m³	0	0	0	0	0
from rivers, lakes and reservoirs	'000 m³	3,037,410	309	53,473	2,983,629	0
Services sector	**'000 m³**	**1,496**	**1**	**279**	**686**	**529**
Groundwater	'000 m³	1,294	1	253	533	506
Spring water	'000 m³	0	0	0	0	0
Bank filtrate	'000 m³	0	0	0	0	0

Own water abstraction 2010 (by company location)	**Unit**	**Total RBU NI**	**RBU Rhine**	**RBU Ems**	**RBU Weser**	**RBU Elbe**
Recharged groundwater	’000 m³	1	0	0	1	1
from rivers, lakes and reservoirs	’000 m³	201	0	26	153	23
Irrigation associations** (showing item from agricultural and forestry sector or services sector)	**’000 m³**	**105,438**	**1**	**205**	**49,847**	**55,384**
Groundwater	’000 m³	94,577	1	4	46,955	47,618
Spring water	’000 m³	0	0	0	0	0
Bank filtrate	’000 m³	0	0	0	0	0
Recharged groundwater	’000 m³	0	0	0	0	0
from rivers, lakes and reservoirs	’000 m³	10,860	0	201	2,892	7,767

Source: State Statistical Offices 2013 (Table NI_Gewinnung_FGE_NichtöffWasser.csv,
*Table NI_Gewinnung_Energie_NichtöffWasser.csv,
**Table NI_Beregnungsverbände_FGE_NichtöffWasser.csv)

Table 59: Use of water from non-public water supplies in Lower Saxony RBUs in 2010, broken down by branches of industry

Water uses by branches of industry, freshwater quantities used in 2010	**Unit**	**Total RBU NI**	**RBU Rhine**	**RBU Ems**	**RBU Weser**	**RBU Elbe**
Agriculture and silviculture	’000 m³	106,188	no data	627	50,154	55,407
Manufacturing sector	’000 m³	3,485,527	2,876	103,066	3,160,765	218,820
Services sector (excl. irrigation associations)	’000 m³	1,181	2	475	188	517
Total quantity of fresh water used	’000 m³	3,592,896	2,877	104,169	3,211,106	274,744

Source: State Statistical Offices 2013 (Table NI_Verwendung_FGE_NichtöffWasser.csv)

6.1.4.2 Internal non-public wastewaterdisposal

Most of the volume of industrial waste water not requiring treatment (as a rule non-contaminated cooling water or special process water) is discharged untreated direct into the water body independently of the public wastewater disposal system.

The indicators for non-public wastewater disposal, i.e. the whereabouts of untreated, unused and treated water, are shown in the following Tables 61 and 62 for the river basin units in Lower Saxony.

Table 60: Whereabouts of unused water from establishments in the non-public sector in 2010, broken down by branches of industry

Discharges of unused water 2010	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
from industry branch 08: Extraction of non-metallic minerals, other mining activities (WZ 08)	'000 m³	483	0	0	483	0
into public sewerage system	'000 m³	0	0	0	0	0
into internal wastewater treatment plant	'000 m³	0	0	0	0	0
directly into a surface water body or the subsoil	'000 m³	483	0	0	483	0
Source: State Statistical Offices 2013 (Table NI_ Betriebe_mit_Gewinnung_NichtöffWasser.csv)						

Table 61: Whereabouts of untreated water from establishments in the non-public sector in 2010

Direct discharges of untreated wastewater into surface waters / subsoil	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Total from manufacturing sector *	**'000 m³**	**3,233,400**	**278**	**37,116**	**3,030,972**	**165,034**
Personnel purposes	'000 m³	19	0	1	17	2
Wastewater from cooling systems	'000 m³	3,212,329	142	35,799	3,012,174	164,214
Production-specific and other wastewater	'000 m³	15,872	135	1,317	13,602	818
Wastewater from other establishments	'000 m³	5,180	0	0	5,180	0
AOX and COD loads in direct discharges						
AOX load **	t	3.01	0.00	0.55	2.36	0.11
COD load ***	t	14,359	1	3,075	10,013	1,270
Total from services sector *	**'000 m³**	**119**	**no data**	**102**	**no data**	**17**
Personnel purposes	'000 m³	1	no data	0	no data	1
Wastewater from cooling systems	'000 m³	118	no data	102	no data	16
Production-specific and other wastewater	'000 m³	0	no data	0	no data	0
Wastewater from other establishments	'000 m³	0	no data	0	no data	0
AOX and COD loads in direct discharges						
AOX load ***	t		no data	no data	no data	no data
COD load ***	t	18	no data	no data	no data	18
Source: State Statistical Offices 2013 (NI, *Table Direkteinleitung_unbehandelt_FGE_NichtöffAbwasser.csv, ** Table Direkteinleitung_unbehandelt_AOX_FGE_NichtöffAbwasser.csv *** Table Direkteinleitung_unbehandelt_CSB_FGE_NichtöffAbwasser.csv)						

Table 62: Whereabouts of treated water from (manufacturing sector) establishments in the non-public sector in Lower Saxony RBUS in 2010

Direct discharges of wastewater treated in internal wastewater treatment plants into a surface water body / subsoil (based on location of discharge point)	**Unit**	**Total RBU NI**	**RBU Rhine**	**RBU Ems**	**RBU Weser**	**RBU Elbe**
Total from manufacturing sector	**'000 m³**	**135,259**	**1,264**	**25,528**	**70,691**	**37,776**
Wastewater volume for which an AOX measurement was specified (without NN)**	'000 m³	92,649	1,105	16,510	38,542	36,492
AOX load (without NN)	t	10	2	2	5	1
Wastewater volume for which a COD measurement was specified (without NN)	'000 m³	134,259	1,264	25,528	69,871	37,596
COD load (without NN)	t	7	0	2	5	1
Total from services sector *	'000 m³	**84**	**no data**	**19**	**41**	**24**
Wastewater volume for which an AOX measurement was specified (without NN)***	'000 m³	41	no data	no data	41	no data
AOX load (without NN)	t	0	no data	no data	0	no data
Wastewater volume for which a COD measurement was specified (without NN)	'000 m³	84	no data	19	41	24
COD load (without NN)	t	0	no data	0	0	0

Source: State Statistical Offices 2013 (NI,
*Table Direkteinleitung_behandelt_FGE_NichtöffAbwasser.csv,
** Table Direkteinleitung_behandelt_AOX_FGE_NichtöffAbwasser.csv
*** Table Direkteinleitung_behandelt_CSB_FGE_NichtöffAbwasser.csv)

6.1.4.3 Use by agriculture and forestry sector

In Lower Saxony nearly 2.6 million ha (approx. 61% of the state's area) is used by the agricultural sector. The share of gross value added is around 1.5%, which corresponds to nearly €3 billion.

Table 63: Farms, areas, water quantities used

Farms and areas in 2010	**Unit**	**Total RBU NI**	**RBU Rhine**	**RBU Ems**	**RBU Weser**	**RBU Elbe**
Number of farms 2010 (incl. double entries)	Number		2,047	15,518	28,227	9,487
Total agricultural land	ha	2,577,016	60,619	594,391	1,432,892	489,114
Arable land	ha	1,863,848	52,277	418,377	1,060,567	332,627
Permanent pasture	ha	693,042	8,203	172,066	367,059	145,714
Permanent crops incl. home and vegetable gardens	ha	20,126	139	3,948	5,266	10,773
Agricultural land with artificial rainfall						
Area that would have had to be watered in 2009	ha	313,693	2,071	15,189	165,602	130,831
Potentially waterable area as	%	12.2	3.4	2.6	11.6	26.7

Farms and areas in 2010	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
percentage of total area						
Area actually watered in 2009	ha	219,070	637	7,358	110,405	100,670
Actually watered area as percentage of total area	%	8.5	1.1	1.2	7.7	20.6
Water quantity used in 2009	'000 m³	167,900	397	5,253	85,246	77,003
Water quantity used / area actually watered	m³/ha	766	623	714	772	765
Source: State Statistical Offices 2013 (Table NI_Gemeinde_FGE_Landwirtschaft.csv)						

Table 64: Gross value added by agriculture in 2010

Gross value added by agriculture in 2010	Unit	Total RBU NI	RBU Rhine	RBU Ems	RBU Weser	RBU Elbe
Total gross value added in RBU	in '000 EUR	192,362,059	3,000,592	37,605,082	133,358,404	18,397,981
Gross value added by agriculture/forestry in RBU	in '000 EUR	2,979,858	103,841	947,857	1,417,668	510,492
Gross value added by agriculture/forestry as percentage of gross value added in RBU	%	1.5	3.5	2.5	1.1	2.8
Source: State Statistical Offices 2013 (Table NI_FGE_VGR.csv)						

6.1.4.4 Energy industry uses

Hydro-power plants

In quantitative terms, electricity generation from hydro power only plays a relatively minor role in Lower Saxony. The hydro-power share of power generation in Lower Saxony came to around 0.4% in 2010, whereas the share due to renewable energy sources came to 2.1%. In total, Lower Saxony generated approximately 324 million kWh of electricity in 2010, in 250 hydropower plants with an installed capacity of 85 MW (BDEW 2011).

Thermal power plants

Thermal power plants use a variety of fuels such as natural gas, coal, heating oil/diesel, waste or other energy sources (e.g. biomass) to produce thermal and electrical energy. The water in thermal power plants is used mainly for cooling purposes, and with the exception of losses due to evaporation it is discharged directly into the surface waters. In Lower Saxony 125 thermal power plants (>1 MW) generated about 11.2 million MWh of heat (net heat) and about 4.99 MWh of electricity in 2010 (Statistische Landesämter 2013). More detailed information on the quantities, conversion and use of energy sources in Lower Saxony is published in the Energy Balance 2010, which was prepared by the Lower Saxony Ministry of the Environment, Energy and Climate Protection in cooperation with the Lower Saxony Statistical Office (LSN) (LSKN 2013).

6.1.4.5 Shipping uses

In all scenarios underlying the Federal Transport Routes Plan, inland waterway traffic shows below-average growth compared with road and rail traffic. Appreciable increases in goods transport are only forecast for mixed cargo. Lower Saxony's seaports are of considerable regional and structural importance for the coastal region. The trend in the economic significance of the seaports is described in the chapter on the baseline scenario. Detailed information (e.g. infrastructure, goods traffic) for the main seaports and inland ports has been compiled by the Lower Saxony Ministry of Economic Affairs, Labour and Transport (MW NI 2014).

6.1.4.6 Flood control uses

In recent years there has been an increase in awareness of flood risks on the part of individuals affected and local authorities. Moreover, the requirements of the Flood Risk Management Directive apply. This shows the success of the instruments used by Lower Saxony in the field of flood precautions, which are listed in the chapter on the baseline scenario.

6.2 Baseline scenario

This chapter describes the main social and economic driving forces that could have a decisive influence on future trends in water body status. The description is based on the conditions currently prevailing and identifiable trends. One cannot rule out the possibility that political decisions, for example, might give rise to further trends or even conflicting trends with impacts on water body status – even within the six-year planning horizon (up to 2021).
The baseline scenario as a planning instrument is intended to make for greater certainty in achieving the objectives and to avoid unnecessary measures/costs.

6.2.1 Demographic change

Demographic change in Germany will lead to a considerable decrease in population figures (Statistisches Bundesamt 2006). The trends in population figures will show great variations, both regionally and locally. The differences in trends in eastern and western Germany which have been observed since the 1990s will continue to exist. At the same time, growth and shrinkage processes will take place in close proximity. For space-related infrastructures such as water, wastewater or district heating, these developments will mean a need to adapt in view of the fact that the efficiency of these infrastructures is largely dependent on population density, and that a drop in user numbers could create a need for additional technical changes due to operating problems.
The impacts of demographic change can be divided into operational impacts on water supply, wastewater transport systems and sewage plants, and ecological, structural and economic impacts. Declining population figures result in lower water consumption. This can lead to deposits, corrosion and odour problems in the sewerage system. It could be necessary to adjust the capacity of sewerage systems and sewage plants, or even to close

and deconstruct installations. Unless the situation can be influenced by improvements in efficiency or adaptation measures, this will lead to increases in specific water prices and/or wastewater charges in the areas affected by demographic change.
Water supply plans and wastewater disposal concepts are intended to fulfil the social, economic and environmental components of the sustainability principle. Additional organisational measures are possible, such as strategic refurbishment and investment planning or deconstruction and closure strategies. Such measures are aimed at optimising the operation and resource economics of the plants. They are thus strategically geared to cost reductions and are primarily intended to offset the economic impacts of demographic change. Increased inter-municipal cooperation on planning and operational management is both advisable and important with a view to further improvements in efficiency − especially in areas with a rapidly shrinking population.

It will be of crucial importance for water supply and wastewater disposal companies to make timely preparations for the expected changes, ensure coordination of urban development and corporate strategy, and draw up long-term investment plans geared to the changing background conditions.
According to the findings of the regional population forecast for Lower Saxony until 01.01.2031[58], the basic tendencies also apply to Lower Saxony and its parts of the river basin units:

- The population of Lower Saxony will probably show a decrease of 6.4% to 7.44 million by 01.01.2031. The main reason for the drop in the population figures is the ongoing birth deficit. The gap between the number of births and the number of deaths will continue to widen in the future. The expected positive migration balance will still not be sufficient to offset the lack of births.
- Demographic trends show great variations between Lower Saxony's regional units. In most districts the population figures will decrease because of both deficits and migration losses. Districts with an increase in population benefit partly from migration gains and partly from an excess of births over deaths. There is likely to be an increase in the number of people living in the major cities of Hanover, Göttingen and Hildesheim, the independent towns of Braunschweig and Oldenburg, and in several rural districts.

The (excerpts from) results shown here are based on the most recent and hence most up-to-date forecast using the 2009 assumptions with a forecast period ending in 2031. Some of those assumptions are already out of date, however, and a reliable new forecast is not expected until next year. Migratory movements in particular are the variable factor in population forecasts and have a great influence on predicted population numbers. Net migration gains have increased again since 2010, with the result that from 2010 to 2012 Lower Saxony gained approximately 20,000 persons per year from outside the state. In other

[58] Lower Saxony Agency for Statistics and Communication Technology (LSKN 2011).

words these changes in the figures have already “smoothed out” the predicted decline in population numbers.
The need for drinking water and wastewater infrastructure will still tend to decrease accordingly, but with sizeable regional differences which will have to be taken into account.

6.2.2 Climate change

The general climate change scenarios suggest that, on an annual average, Germany will become warmer. The summers will be hotter and drier, and the winters mild and wetter[59]. The methods used to determine regional climate projections are undergoing further development. Although the results still show signs of uncertainties, the tendency of the changes identified in the principal meteorological parameters such as temperature and rainfall is pointing in the same direction for all methods.
The KLIFF research alliance “Climate Impact Research in Lower Saxony” forecasts that the mean annual temperature in Lower Saxony towards the end of the century (2071-2100) will rise by about 2.5°C compared with the reference period 1971-2000. The increase will be highest in winter, at approximately 3 degrees. The higher temperatures could also result in an increase in the length of the vegetation period by up to about 60 days by the end of the century; as a result, there could be a drop of about two thirds in the number of frost days. Climate researchers expect an increase in rainfall in winter, spring and autumn towards the end of the century, while a decrease of around 10% is forecast for Lower Saxony. The calculations indicate that there could be a marked increase in the number of heavy rainfall days, especially in the autumn. The average duration of heat periods in summer could increase by 50%.

The impacts of economic relevance to the water industry can therefore be expected to bring changes:

- coastal defence: due to the faster rise in sea level and, as a consequence, storm tide levels and the resulting increase in risk,
- inland flood control: due to changes in the size, duration and frequency of flood water discharges and any resulting change in flood risk,
- groundwater resources and water supply: due to changes in groundwater recharge, groundwater quality and groundwater management,
- water body conservation: due to changes in seasonal run-off and temperature conditions with impacts on the materials balance of rivers and lakes and on biocenosis,
- soil protection/water conservation: due to increased erosion as a result of more frequent heavy rainfall events; increase in inputs of substances into water bodies,

[59] The following remarks are taken from the Lower Saxony Government Commission on Climate Change Mitigation (MU NI 2012).

- water body development: due to changes in the dynamics of rivers and lakes, their morphological situation, their heat balance, and possibly reservoir management,
- water body use: due to increased heat input resulting from use of water for cooling purposes, or water abstraction for agricultural irrigation in particular,
- effects on the run-off situation: due to increased water storage for raising low water levels or for flood water retention.

The impacts will vary from region to region, which will make it necessary to take an approach based on river basins, or on smaller subdivisions in the case of large catchment areas, depending on state-specific conditions.

6.2.3 Trends in water demand

6.2.3.1 Private households

Developments in the “private households” sector can be seen from the population statistics in particular (cf. Chapter 6.2.1 Demographic change)
In the past 25 years there was first a sharp decrease in population-specific drinking water consumption per head per day, followed by stagnation in recent years. Consumption in Lower Saxony is around 126 litres per head per day. In parallel with the decline in water consumption, there has been a rise in drinking water prices and wastewater charges. However, the decline in consumption is not due entirely to the rise in costs, but also to increased public awareness of environmental issues, accompanied by increased use of energy-saving and water-saving appliances. In view of the nationwide population trend and specific per capita consumption, however, future demand will only fall slightly, if at all.

6.2.3.2 Agriculture

Watering is practised on about 300,000 ha of agricultural land in Lower Saxony, which amounts to nearly 12% of the state’s agricultural area. In the eastern rural districts of Lower Saxony the watered area may be as much as 90% of the agricultural area. A total of over 200 million cubic metres of water, mainly from groundwater, can be used for watering farmland in Lower Saxony.
In the short and medium term, the trend in demand for water and hence the impacts on the water balance depend on the legal framework and also on the agricultural policy framework which is largely determined by the EU. Predicted changes in the climate are not expected to have significant impacts before 2021. In the long term, the lower summer rainfall resulting from climate change can be expected to lead to an increase in watering.
This will affect the north-eastern part of Lower Saxony in particular, see Fig. 11.

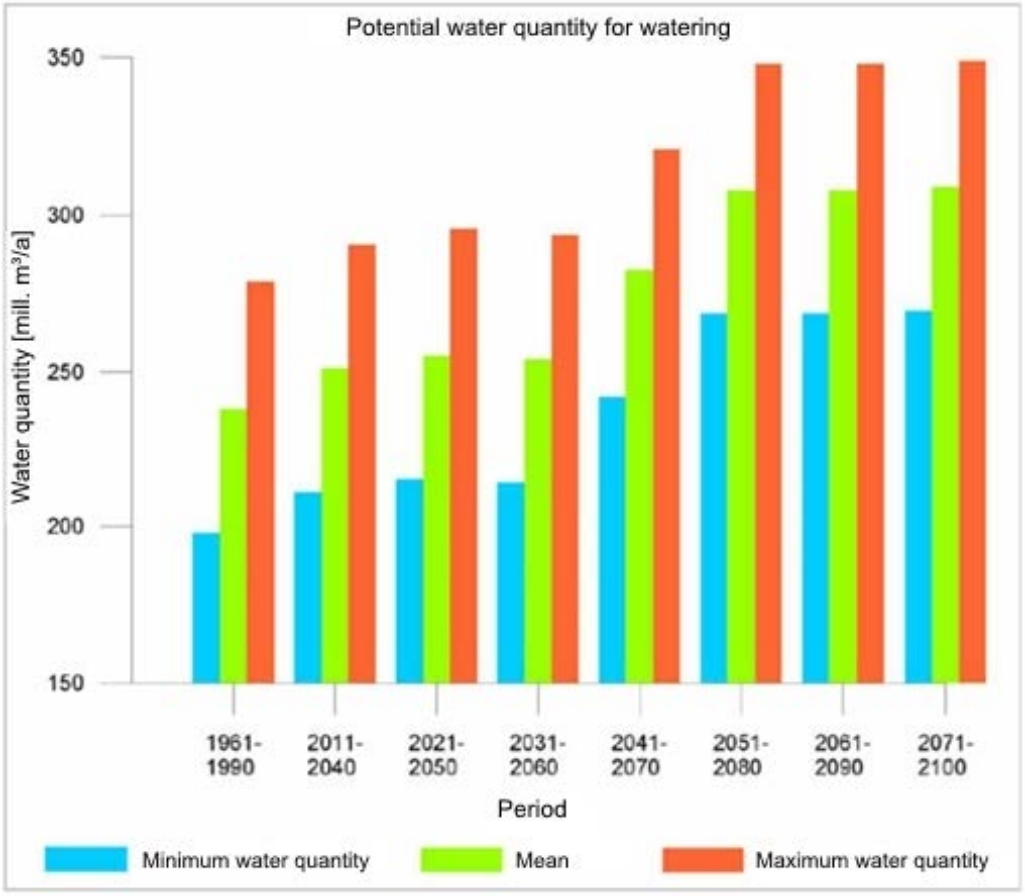


Fig. 11: Potential volume of water in million m³/a for watering an area of 8,400 km² in north-eastern Lower Saxony (Heidt, L. 2009)

6.2.3.3 Industry

Studies to assess the development of industrial water consumption up to 2020 show that in recent years the various branches of industry have developed and implemented numerous technical approaches for improving wastewater treatment, making further reductions in water consumption and increasing the closure of water cycles. Further measures of this kind can be expected in the future. By 2020 different developments can be expected in individual branches of industry with regard to the specific water intensity factor: for example, reductions averaging 20 to 30% in the metal producing and processing industry, the food industry or petroleum processing, and reductions of up to 50% in the paper industry (Hillenbrandt & Böhm 2008).

It is the declared aim of energy policy in Lower Saxony to further expand the contribution of renewable energy sources to energy supply. In the course of these developments, we can expect a decrease in power production by cooling-intensive thermal power plants and a reduction – and also greater fluctuations – in water abstraction for cooling purposes. The Grohnde nuclear power plant will cease to operate not later than 2021, and the Emsland nuclear power plant not later than 2022. There will tend to be a decrease in cooling water demand for conventional power plants – which are also needed to support the energy

transition during the period in question – as a result of shorter life cycles and the reduction of surplus capacity on the electricity market.

6.2.4 Trends in wastewater discharges

6.2.4.1 Households

The implementation of the Urban Wastewater Directive led to a marked reduction in pollutant loads from municipal sewage plants. In recent years no further significant improvements in purification performance have been found for the parameters COD (TOC), nitrate and phosphate. The requirements of the directive are satisfied.
The effects of demographic trends on wastewater quantities are obscured by the impacts of climate change. The influence of a change in the rainfall run-off situation has to be seen in direct connection with the trend in sealing of surfaces. An increase in sealed surfaces leads to an increase in the run-off and pollutant loads from these surfaces. As far as municipal drainage is concerned, a marked increase can therefore be expected in the importance of rainwater drainage and treatment.
The reduced water consumption could give rise to deposits, corrosion, odour problems and a less favourable C/N ratio as a result of degradation in the sewer. It could be necessary to take measures to adapt to these trends, such as capacity adjustment, plant deconstruction or closure.
Limiting or reducing contamination of water bodies with anthropogenic trace substances such as pharmaceuticals and cosmetics will become increasingly important. However, there is still a great need here for scientific findings as a basis for sustainable decisions and investment decisions.
Another connection between demographic developments and the environment that is discussed in the literature exists in relation to inputs of pharmaceuticals into wastewater and water bodies. Although inputs of pharmaceuticals or their active ingredients into the aquatic system can not be attributed entirely to demographic change, the increasing age of society – in conjunction with the increase in non-prescription medicines – is contributing to greater consumption of pharmaceuticals (cf. Chapter 2.3.4 of the Lower Saxony contribution to the programmes of measures).
Over 96% of the population of Lower Saxony are connected to a sewerage system. In non-built up areas, wastewater is treated on a decentralised basis, so no further change in the connection rate is to be expected. The demand that may arise on a regional basis from the above-mentioned effects on planning, e.g. amalgamation of sewage plants, does not as yet show any clear trends in the river basins.

6.2.4.2 Industry

The development of wastewater discharges by industry is influenced by the factors: economic development and economic change, technological development, integrated pollution control measures and legislative measures and funding programmes.

Integrated pollution control measures can be expected to continue reducing wastewater loads and wastewater quantities.

6.2.5 Trends in the agricultural sector

For the Thünen baseline 2013 – 2023 the development of agriculture largely depends on the implementation of the reform of European agricultural policy decided in 2013 and its transposition into national law in line with the decision by the German conference of ministers of agriculture (Offermann et al., 2014).
The reform of the Renewable Energy Sources Act (EEG) in 2012 and a comparatively high level of agricultural prices are resulting in less dynamic expansion of biogas production. Nevertheless, measures to promote bioenergy still have a great influence on the development of agricultural land use in Germany. The Thünen baseline 2013 − 2023 shows that around 1.2 million hectares are being used to grow maize for energy. This also contributes to a further decline in the area under cereal crops (-7%). As a result of rising milk prices following the end of the milk quota, production will expand to about 34.5 million t by 2023. This corresponds to a rise in milk production of around 18% compared with the years 2009/2011. Above-average expansion of milk production is taking place mainly in the coastal regions, on the lower Rhine, in a number of central upland regions and in the Allgäu and the Alpine foothills, whereas a decline in milk production can be observed especially in arable farming areas, e.g. the Cologne lowlands, Hildesheimer Börde and the north-east of Brandenburg.

6.2.6 Trends in hydro power

In quantitative terms, hydro power plays a relatively minor role in the renewable energy sector in Lower Saxony. Electricity is generated here in about 250 plants. Their installed capacity is around 85 megawatts. Thus about 0.4% of Lower Saxony's electricity is generated by hydro power. The possibilities for generating energy from hydropower in Lower Saxony are regarded as largely exhausted. However, other projects are under discussion and the use of small-scale hydroelectric power plants is being investigated. Other possibilities could be developed here.
In future the question of whether the construction, expansion or modification of a hydro-power plant can be considered justifiable will continue to depend on the circumstances of the individual case, having regard to the type of project, the local conditions, the statutory and/or regulatory requirements, the management objectives and programmes of measures, and the discretionary decisions taken by the approval and licensing authority. Expansion or efficiency improvements at existing hydro-power locations may make sense.
Lower Saxony also has technical potential for large-scale storage technologies, and especially for surface pumped storage systems. One problem here is economic feasibility, which is viewed in a critical light in today's energy market design. Other challenges on the way to large-scale pumped storage systems are the question of legal feasibility and, above all, of public acceptance. Answers must be found here in a dialogue with the responsible bodies and the general public.

6.2.7 Trends in shipping

In all scenarios underlying the Federal Transport Routes Plan, inland waterway traffic shows below-average growth compared with road and rail traffic. Appreciable increases in goods transport are only forecast for mixed cargo.
Lower Saxony's seaports are of considerable regional and structural importance for the coastal regions of Lower Saxony. Since 2010 the ports have suffered considerable setbacks in the field of goods traffic. The development of Lower Saxony's seaports since the year 2000 shows an up and down trend. The biggest turnover of goods in Lower Saxony's seaports was 66.6 million tonnes in 2005. After that, the total turnover figures showed an almost continuous decrease until 2010. However, the slight upward trend in 2011 was maintained in 2012. A further increase in container traffic is forecast for marine shipping as a whole in the years ahead.
The government of Lower Saxony expects that the JadeWeserPort will gain increasing acceptance as Germany's only deepwater port and and that this will lead to changes in transport routes. The fairway modifications to the Elbe, Weser and Outer Ems, for which the applications have yet to be decided, will also have an influence on transport routes.

6.2.8 Trends in flood control

In recent years there has been an increase in awareness of flood risks on the part of individuals affected and local authorities. This shows the success of the instruments used by Lower Saxony in the field of flood precautions:

- designation of flood areas,
- preparation of flood control plans and assistance for local authorities with preparing flood control concepts for small water bodies, and
- provision of information in the form of hazard and risk maps.

General information on the development of precipitation in recent decades is also available from the project "Global climate change – water management impacts for the hinterland" (KliBiW). Among other things, the project investigated past trends in precipitation and calculated trend forecasts.
In the field of climate impact research, a water balance model is also being used to conduct water management studies of potential impacts of climate change in relation to flooding and low water. There are close synergies here which can be directly applied in the use and further development of a flood forecasting model.
In addition to continuing work on calculations and safeguards for flood areas, Lower Saxony also intends to successively extend the Flood Forecasting Centre (HWVZ) that has been in existence since 2009 to other catchment areas. In addition, it will step up cooperation with partners like the local authority environmental campaign (U.A.N.) and continue the research project investigations into possible impacts of climate change on the flood situation in Lower Saxony.

The Flood Risk Management Directive envisages that the flood risk management plans are to be in place by the end of 2015. Important items of content based on the findings of the flood risk management plans that are to be drawn up from the hazard and risk maps include suitable objectives and measures appropriate to the endangered area which can be used to reduce flood risks. While flood risk management plans take account of all aspects of the Flood Risk Management Directive, the focus is on prevention, control and precautions, including flood forecasting and early warnings, and also on non-constructional measures for flood control and reducing the probability of floods.
Since local and regional flood control and risk prevention are tasks of the local authorities and associations, the local actors were called upon to take part in the process of drawing up flood risk management plans and to notify any measures in their own material and spatial spheres of responsibility that they want to begin or implement with their own financial resources. The measures will then be included in the individual flood risk management plans drawn up for the Elbe, Weser, Ems and Rhine river basins.
Under the Flood Risk Management Directive, this is to be co-ordinated with the requirements of the WFD. In accordance with Section 80 of the Federal Water Act, the two directives are to be co-ordinated with a view to improving the efficiency, exchange of information and joint advantages for achieving the environmental objectives of the WFD.

6.2.9 Water body maintenance

As an important contribution to added value for agriculture, industry, services and trade, especially in the lowland areas of the North German plain, the maintenance associations throughout Lower Saxony in the Elbe, Weser, Ems and Rhine river basins perform their services to ensure proper discharge of the water having regard to the natural balance. Water body maintenance is a public-sector obligation which involves potential conflicts with nature and species conservation in particular. The requirements for water body maintenance are regulated in the water legislation at federal level and in Lower Saxony.

In Lower Saxony, second-order water bodies covering a total area of 45,800 km are maintained by a workforce of about 1,200 at a total cost of about €61 million. Water body maintenance in Lower Saxony is currently being reorganised to take account of the requirements of the Water Framework Directive (“as little as possible, as much as necessary”). To this end, a start has been made on drawing up guidelines and providing training to familiarise the maintenance personnel with the new requirements. To take account of environmental concerns in the maintenance of federal waterways, the Federal Institute of Hydrology (BfG) provides a suitable guideline on its website.

Table 65: Water body maintenance in Lower Saxony

Area of association Total	Length of second-order water bodies	Administrative budget spending on maintenance of second-order water bodies	Administrative budget spending Total
4,686,144 ha	28,560 km	€56,172,786	€98,239,111

6.3 Covering the cost of water services

6.3.1 Description of statutory requirements

"Water services" means drinking water supply and wastewater disposal[60]. According to the requirements of Article 9 (1) of the WFD, the principle of cost coverage of water services, including environmental and resource costs, is to be observed on the basis of the "polluter pays" principle. The term "water services" is defined in Article 2 No. 38 of the WFD, the term "water uses" in Article 2 No. 39 of the WFD.
In Germany it can be assumed – except in individual regional cases – that hardly any resource costs arise from water shortages. A study in Lower Saxony shows that in this connection the distinction between environmental and resource costs generally fails to serve the purpose in view (Buchs & Cortekar 2013).

In the public-sector calculation of water charges, the principal of cost coverage is based on the relevant municipal charges legislation in the individual federal states. These are based on a comprehensive commercial definition of costs. However, costs of external effects, such as environmental and resource costs, are not systematically included.
In Lower Saxony the requirements for the calculation can be found in Section 5 of the Municipal Charges Act, "User Charges"[61]. This states that the income for an accounting period (usually the calendar year) must cover the costs for the operation of the water supply and wastewater disposal facilities. At the same time there is also a basic ban on exceeding costs. In other words, the income received must not exceed the amount necessary to cover the operating costs. Because the user charges have to be calculated in advance and this involves considerable use of estimates of both the probable costs and the probable water quantities, court practice tolerates minor cost exceedances to a certain extent. The responsible bodies have to cancel out any cost surpluses or deficits in the years that follow.

The calculation of private-sector charges also has to be undertaken having regard to the basic principles of municipal charges legislation. Among other things, this follows from the fairness test pursuant to Section 315 of the German Civil Code. This states that where companies, under a private-law use relationship, provide public-interest services on which the other contracting party is dependent, their rules on tariffs and other charges must be fixed on the basis of reasonably exercised discretion and their fairness must be verifiable.

Water services provided in public-law form (charges) are subject to local government supervision; water services provided in private-law form (prices) are subject to control of abuse under cartel legislation.

[60] In this connection the European Commission has decided to bring an action against Germany. (Status May 2012).
[61] Cf. Section 5 (User Charges) of the Lower Saxony Municipal Charges Act (NKAG) in the version of 23.01.2007 (Nds. GVBl p. 41), as most recently amended by Section 3 of the Act of 18.07.2012 (Nds. GVBl. p. 279)

6.3.2 Description of the (unchanged) cost coverage levels and indicator comparison in Lower Saxony

Lower Saxony has updated the evidence of cost coverage first compiled in 2009. To this end it performed a primary data analysis of the commercial data from the local authority annual accounting statistics and the end-of-year statistics on funds, facilities and companies (FEU) of all water service providers that are majority-owned by local authorities.

Table 66: Cost coverage of water supply

Water supply (2012)	Income [EUR]	Expenditure [EUR]	Cost coverage level [%]
RBU Rhine	17,897,157	16,862,718	106.1
RBU Ems	105,199,779	100,643,162	104.5
RBU Weser	390,961,047	374,421,484	104.4
RBU Elbe	53,011,491	50,755,901	104.5
NI total	567,069,474	542,683,265	104.4

Table 67: Cost coverage of wastewater disposal

Wastewater disposal (2012)	Income [EUR]	Expenditure [EUR]	Cost coverage level [%]
RBU Rhine	10,944,720	9,727,374	113.0
RBU Ems	173,224,572	144,622,076	119.8
RBU Weser	811,177,565	724,895,976	111.9
RBU Elbe	142,517,451	132,026,401	107.9
NI total	1,137,914,308	1,011,271,827	112.5

The principle of cost coverage is a central component of the municipal charges legislation of Lower Saxony. The charge rates are fixed on the basis of the principles: cost coverage, equal treatment and equivalence.
The German water management sector runs a wide variety of benchmark projects that are usually commissioned by the ministries of the interior, economic affairs and the environment of the federal states; in some cases the projects are commissioned by the associations themselves. The cost effectiveness of the water services “water supply” and/or “wastewater disposal” has a special significance among the parameters measured. In this connection some projects determine cost coverage by comparing the cost and income for the water service in question. Even if the benchmark projects are primarily initiated to strengthen the companies’ economic and technical performance, these projects yield a wealth of economic data and information that can also be relevant to the economic analysis.
In Lower Saxony the comparison of water supply parameters was performed in 2010 and 2012. One parameter always determined was the cost coverage ratio, with the following results

- Project year 2010: 105.7% (mean)
- Project year 2012: 105.2% (mean)

The comparison of parameters in 2012 covered 62% of the recorded water supply to households and trade.

6.3.3 Description of the nature and scale of the inclusion of environmental and resource costs in cost coverage

To be able to apply the principle of cost coverage, it is first necessary to clarify what costs are and which costs can be considered. Art. 9 of the WFD works on the basis of the term “costs”, without actually defining it. To ensure an extensive incentive to make efficient use of water, the underlying commercial costs include not only cash-based costs (which do not take account of the depreciation of assets), but also value-based costs (which include the depletion of the value of assets). By contrast, the environmental and resource costs specifically mentioned in Article 9 are costs to the national economy. They are not defined in the WFD either. The situation is complicated by the fact that in the course of the joint implementation process (CIS) the WATECO guideline and the information paper by the Drafting Group (DG) ECO 2 arrived at definitions that were not identical. This primarily concerns the definition of resource costs, which are given a very broad interpretation in the DG ECO 2 information paper (in the sense of incorrect allocation of water resources).

In view of the lack of clarity and the current situation described, a study was performed in Lower Saxony to focus on the possibilities of recording environmental and resource costs in Lower Saxony. The design of the study also included the application of the “polluter pays” principle where possible. In view of the unclarified legal interpretation of the terms “environmental costs” and “resource costs” and the uncertain situation arising from the proceedings for infringement of treaty obligations, an economic abstraction of the directive’s requirements formed the starting point for the study. Its method and results are described below. The central question here is: to what extent can environmental and resource costs be included in pricing, and to what extent does rigorous application of the “polluter pays” principle makes sense with regard to achieving the objectives of the directive? (Buchs & Cortekar 2013)

The design of the study comprised a statewide approach based on the facts and figures from the management plan and also investigated possible environmental and resource costs directly at the water services provider. The results were as follows: in the first instance, registering contamination as a basis for determining environmental and resource costs did not present any special challenges. Determining the environmental and resource costs themselves was more difficult, because the recording methods sometimes involve considerable input. In most cases, no cost-based assessment exists at present. The statewide approach reveals a complex picture of the contamination of the water bodies and its impacts. In particular this showed the limits to the determination of action paths, and hence the difficulty of quantifying the environmental and resource costs or even clearly identifying polluters.

According to these findings, the existing evidence of cost coverage by water service providers is indeed inadequate, not because the activities of water service providers impede the achievement of the WFD objectives, but because for various reasons it is not possible to internalise external costs on the basis of the polluter-pays principle.

One of the implications of the study is that the distinction between water services and water uses does not offer any added value from an economic perspective and with regard to achievement of the WFD objectives. This is due to the fact that, irrespective of the provision of water services, environmental and resource costs arise which have to be considered, but cannot meaningfully be internalised through water prices. To date, the existing burdens have largely been internalised by means of regulatory instruments, for which no further information on the size of environmental and resource costs is needed or for which the effort required for more detailed data acquisition would be out of proportion to the gain in information (cf. Annex III to WFD).

6.3.4 Description of the (unchanged) importance of the instruments “wastewater charge” and “water abstraction charge”

In addition to the environmental conditions imposed on water service providers, the requirement in Article 9 that environmental and resource costs be taken into account with regard to cost coverage of water services is already largely implemented in Germany by means of two instruments in particular: the water abstraction charges payable to the federal states, and the nationwide wastewater charge. Through their steering and financing functions, these instruments not only serve the purpose of internalising environmental and resource costs, but also contribute to achieving the management objectives of the WFD. Furthermore, the costs of a large number of precautionary and damage prevention measures such as precautions in water conservation areas, voluntary quality assurance measures going beyond the statutory requirements etc., are already covered as environmental and resource costs.

6.3.4.1 Water abstraction charges

Water abstraction charges observe the principle laid down in Article 9 that environmental and resource costs are to be charged in accordance with the polluter-pays principle, and their design contributes to regionally differentiated and precaution oriented resource management. They make the use of water more expensive and thereby draw attention to the environmental impacts of water abstraction. They create incentives to make sparing use of resources and hence support sustainable and precaution oriented resource management (Gawel et al. 2011).
The introduction of the water abstraction charge in Lower Saxony in 1992 for the first time provided additional funds explicitly earmarked for water management and nature conservation. The levying of the water abstraction charge is regulated in Section 21 of the Lower Saxony Water Act, and the use of this income in Section 21 (6) of the act. The income is invested for a variety of tasks in the field of water conservation (e.g. drinking water protection for coastal defence). A water abstraction charge is payable depending on the type of abstraction. The relevant regulations can be found in Section 22 of the Lower Saxony Water Act. The greater part of the income results from abstraction by power plants and industry for cooling purposes and the production quantities of the public water supply system.

Additional income arises in the field of trade and industry, and also water retention, irrigation and fish farming.
In 2013 the total income from water abstraction charges in Lower Saxony came to around €47.5 million.

6.3.4.2 Wastewater charge

The wastewater charge has been levied since 1981 on the basis of the Wastewater Charges Act of 1976. It has demonstrably contributed to reducing pollutant inputs into water bodies, and has encouraged investment in wastewater management. The environmental costs associated with discharging wastewater are charged in accordance with the polluter-pays principle by assessing the burden of charges on the basis of the harmfulness of the wastewater discharged. The wastewater charge thus contributes to internalising environmental and resource costs due to wastewater discharges, and thereby extensively addresses the objective of Article 9.
A scientific expertise commissioned by the Federal Environment Agency yielded extensive evidence that the existing systems of charges (water abstraction charges and wastewater charges) have proved their worth (Gawel et al. 2011). A follow-up study investigated the extent to which the wastewater charge can be adapted to changing basic conditions in the wastewater management sector to provide even better support for the process of implementing the WFD (Gawel et al. 2014). Wastewater charges in 2010 totalled €18.44 million[62]. The wastewater charge is allocated under the wastewater charge levying system. The percentage of the wastewater fee due to the wastewater charge averages around 3% (DWA 2011). The income from the wastewater charge is earmarked and used in particular for measures to improve water quality.
In 2013 the total income from wastewater charges in Lower Saxony came to around €32.2 million.

6.3.5 Description of nature and scale of contribution to cost coverage by other water uses

Article 9 (1), sentence 2, second indent of the WFD requires that the various water uses, which are to be broken down at least into the sectors households, industry and agriculture, must make an appropriate contribution to covering the costs of water services.
Indirect discharges (households and industry) into municipal sewage plants have impacts on the costs of the water service “municipal wastewater disposal”. The input required to provide the necessary infrastructure (sewage plants and sewer network) varies depending on the nature and scale of the discharges. Appropriate participation by indirect dischargers is ensured by levying wastewater charges, in this case by means of consumption-based and non-consumption-based price components. Quantity-based charges are made for foul water and wastewater, usually on the basis of fresh water consumption. Area-based charges are used for discharges of rainwater and surface water, and in some cases also for foul water discharges. For rainwater assessment purposes, a distinction is also made between

[62] Water charge collected: €18.44 million (assessed charge: €22.71 million, settled charge: €4.27 million

recurring fees and recurring contributions, the latter being payable for the mere availability of a service even if it is not used.
In the case of industrial wastewater discharges into the public sewerage system and sewage plants, the special pollution load on the sewage plant can be taken into account by means of “heavy polluter contributions”.
Water abstraction (households, industry and agriculture) from the public water supply system have an impact on the cost of providing this water service. The rates for providing drinking water for the uses mentioned include volume-based prices and basic prices to cover fixed costs. Participation can therefore be assumed to be based on appropriate shares.
Diffuse substance inputs into water bodies (surface waters and groundwater) by the agricultural sector in particular may give rise to a need for increased treatment on the part of the water service “public water supply”. Here Article 9 (1), sentence 2, second indent of the WFD requires an “appropriate contribution” to covering the costs of water services on the basis of the economic analysis and having regard to the polluter-pays principle.
Since precise individual allocation of authorship as would be required under the rule of law is practically impossible here, and since no public-charge instruments exist as yet, regulatory law is used in this sector to charge the costs to the polluter.
There are a number of instruments in regulatory law that are aimed at preventing substance inputs and ensuring precautionary protection of water bodies (such as the requirements and prohibitions in water conservation areas, designation of riparian strips with bans on use, regulations in fertiliser and pesticide legislation), which indirectly result in the costs being at least partially charged to the polluter.

6.3.6 Description of existing and new incentives in water fees policy

Considerable incentives to provide efficient water supplies have been created in Germany in the past and are still used to the present day:
A comparative analysis of water and wastewater prices for Germany, England/ Wales, France and Italy found, among other things, that

- per capita water consumption in Germany is very low;
- average water and wastewater prices in Germany are very high;
- investment, especially in the wastewater sector, in Germany is high;
- Germany has a high standard of purification in wastewater treatment;
- public grants only account for a small share of the income from water supply/ wastewater disposal in Germany (Metropolitan Consulting Group 2006).

These findings indicate not only high quality standards in the water services sector in Germany, but also a high level of cost coverage and considerable fee policy incentives to make efficient use of water in the spirit of the WFD.
The “Profile of the German water industry 2008” confirms these findings and underlines the great efficiency of water supply and wastewater disposal in Germany (ATT et al. 2006):

- The decline in per capita water consumption in Germany from 1990 to 2011 (on a European comparison as well) shows that German water fees policy has in the past created appropriate incentives for users to make efficient use of water resources and thereby contribute to the environmental objectives of the WFD.
- With over 99% of the population connected to public water supplies, Germany achieves a very high level. The same is true of the 96% connection rate to the public sewerage system in Germany.
- In accordance with the objectives of the WFD, the status of the drinking water network in Germany is a very good. Water losses in the public drinking water network, including quantities removed for internal purposes and fire protection, amount to 6.8%, which is a very low figure on a European comparison.
- The proportion of wastewater discharged untreated into the environment is extremely low at only 1%. Moreover, Germany's figure of 90% for connection of the population to municipal sewage treatment plants with the highest treatment stage is already very high.
- In Germany nearly all households have a water meter which permits allocation of costs to the responsible party.

Per capita water consumption in Germany has been substantially reduced over the past 20 years. In 1991, average water consumption was around 141 litres per head per day. More economical washing machines, dishwashers and toilets, and also increasing water costs, resulted in average water consumption in Germany falling to 122 litres per head per day in 2007.
It can therefore be stated that the objectives of Article 9 (1), first indent of the WFD are already fulfilled:

- owing to relatively high user-appropriate prices for drinking water supply and wastewater disposal, per capita water consumption in Germany has been steadily falling for years.
- High technical standards aimed at reducing water losses in the water services sector have been in force in Germany for many years.
- Furthermore, the wastewater charge is levied nationwide and various regionally differentiated water abstraction charges are payable.

The tariffs for water services in the water supply and wastewater disposal sector provide extensive incentives to make efficient use of resources. As a rule, the water supply companies in Lower Saxony use a two-stage tariff system consisting of a consumption-based component and a fixed component that is not based on consumption. To determine the consumption-based component, every residential building in Germany that is connected to the public water supply has a water meter. On average, the non-consumption-based component accounts for only about 10% of the total charge for drinking water supplies.

Suitably strong incentives are provided by the consumption-based tariff component. This is confirmed by the trend in per capita water consumption in Germany.
These incentive structures also apply to the water service provided by the wastewater disposal sector, because the wastewater fees are usually calculated on the basis of the quantity of fresh water consumed. About 11% of the population have to pay a basic fee for wastewater disposal. Many citizens also receive an invoice broken down by foul water and rainwater.

7 Summary of Lower Saxony contribution to the programmes of measures 2015 to 2021 for the Elbe, Weser, Ems and Rhine river basins

The Lower Saxony contribution to the programmes of measures for 2015 to 2021 for the Elbe, Weser, Ems and Rhine river basins pursuant to Section 117 of the Lower Saxony Water Act or Article 11 of the WFD includes a list of the legal provisions as basic measures and the types of supplementary measures pursuant to Article 11 (2) to (4) of the WFD.

Chapter 1 provides an introduction to the Lower Saxony contribution to the programmes of measures in the river basins. Lower Saxony has once again designed the Lower Saxony contribution to the programmes of measures as a range of offerings.

Chapter 2 is a very important chapter, which explains the strategies and concepts for achieving good status in surface waters and groundwater in Lower Saxony. On the basis of the updated inventory, the important water management issues and the assessment findings, it sets out for both surface waters and groundwater the types of supplementary measures needed to achieve the management objectives in the second management cycle and beyond. The supplementary types of measures are based on the list of measures drawn up by LAWA as a basis for notifying the measures to the European Commission. Accordingly, 51 types of measures to be offered for surface waters and groundwater in Lower Saxony were selected from the LAWA list. These types of measures also have recourse to the first programme of measures and the experience gained during their implementation. The chapter also explains aspects relating to the use of surface waters and groundwater bodies in conservation areas. Chapter 3 describes the implementation of the 2009 programme of measures. It provides a brief outline of successes and problems.

The basic measures are set out in Chapter 4. A common feature of basic measures is the fact that they have to be implemented by means of abstract general provisions in relevant acts, ordinances and binding instruments for the protection of the environment and especially of water bodies in Lower Saxony. In its presentation of the supplementary types of measures, Chapter 4 of the contribution to the management plans explicitly describes measures that are new or particularly important for Lower Saxony. The relevant types of measures for each water body are described in the Appendix. No differentiated description is provided of the location, size and design of the individual type of measure. This is due to the programmatic approach of the Lower Saxony contribution to the programmes of measures for the river basins, since a certain flexibility in implementing the measures needs to be ensured in view of the long planning period. Aspects of implementation, especially information on financing, are addressed in Chapter 5.

8 List of detailed programmes and management plans

8.1 Integrated management plans: Elbe, Weser, Ems

The lower reaches and estuary zones of the Elbe, Weser and Ems are characterised by tidal flows and the interaction of seawater and freshwater influences. For these highly dynamic and productive natural regions between river and sea, Lower Saxony has drawn up "Integrated Management Plans"[63] (IMPs) jointly with the relevant federal states of Hamburg, Schleswig-Holstein and Bremen and the Netherlands (Arbeitsgruppe Elbeästuar 2011, Arbeitsgruppe Weser 2012). The integrated management plans provide the conceptual conditions for satisfying the requirements of nature conservation (Natura 2000) and water conservation (WFD) in harmony with other social, economic and cultural requirements and implementing them within a planning period of 10 – 15 years.
In a transparent process, regional industrial and environmental associations, the competent technical and administrative authorities and representatives of other stakeholder interests were given the opportunity of taking part in the multi-year drafting process. As a result, the action recommendations and proposed measures set out in the individual integrated management plans take account of use-related issues as far as is compatible with the ecological requirements of the assets protected under Natura 2000.
The IMP Elbe (November 2011) and the IMP Weser (February 2012) are completed and are already undergoing further implementation, especially by the competent state authorities for nature conservation or the federal authorities (Federal Waterways and Shipping Directorate). Work on the IMP Ems only started in Lower Saxony and the Netherlands at the beginning of 2011 and is to be completed by spring 2016. The IMP Ems well then be available for Lower Saxony and the Netherlands in a joint document in the relevant national languages.

8.2 Ems Master Plan 2050

In view of the present ecological status of the Ems estuary, and particularly the lower Ems, the need for action is particularly great here. The Ems steering group will therefore develop a programme of measures for making sustainable improvements in water quality and restoring typical estuarine habitats and natural sediment dynamics. This Ems Master Plan 2050, for which a declaration of intent was signed on 16 June 2014, included the signing of an agreement between the parties concerned (Lower Saxony government, Federal Waterways and Shipping Directorate, local authorities, environmental associations and the maritime industry). It runs until the year 2050. The extensive programme of measures is intended to restore important estuarine ecosystem services, especially by overcoming the mud

[63] http://www.nlwkn.niedersachsen.de/naturschutz/natura_2000/integrierte_bewirtschaftungsplaene_aestuare/integrierte-bewirtschaftungsplaene-fuer-die-aestuare-von-elbe-weser-und-ems-45640.html

problems. It is also to improve capacity to regulate the nutrient balance. The objectives and measures of the master plan are to be supported by measures financed under the EAFRD programme PFEIL (duration 2014 to 2020), and by practice-oriented research and the resulting recommendations on management in the estuary and its catchment area.

8.3 Water management area, Goslar rural district

In view of its history of mining activities, large parts of the area covered by the Goslar rural district are contaminated with pollutants. With regard to the implementation of the WFD, a provision meeting the requirements of the WFD lays down that a background level resulting from mining activities and typical of the Harz is to be recognised as a basis for all subsequent steps. The standard for good status of the water bodies cannot be achieved either in the course of time or by means of specific measures. It was therefore necessary to set divergent management objectives. In the context of planning for the water management area of the Goslar rural district, various concepts have been presented for achieving the best possible ecological and chemical status and reversing the trend (Landkreis Goslar 2007)

9 Summary of measures to inform and obtain feedback from the public, and the results of public participation

9.1 Measures to inform and actively involve the public

According to Section 85 of the Federal Water Act, member states are to encourage the active involvement of all interested parties in the implementation of the directive, in particular in the preparation, review and updating of the river basin management plans. In addition to the management plan, this includes the timetable and work programme (already published) for drawing up the management plan, and also the overview of important water management issues. The draft of the Lower Saxony contribution to the management plans 2015 to 2021 for the Elbe, Weser, Ems and Rhine river basins was exhibited for six months starting on 22 December 2014. In parallel with this, the draft of the Lower Saxony contribution to the programmes of measures 2015 - 2021 for the Elbe, Weser, Ems and Rhine river basins was also part of the public participation process.

This had been preceded by the inquiries into the timetable and work programme and the major water management issues. The inquiries were accompanied by a wall calendar published by the NLWKN: “Was das Wasser bewegt – Wichtige Wasserbewirtschaftungsfragen in Niedersachsen”. This calendar takes up major water management issues in its text and illustrations, and can be downloaded from the NLWKN website together with documents on the river basins.

In Lower Saxony, interested parties and water users are involved in reviewing and updating the drafts of the Lower Saxony contributions to the management plans and programmes of measures.

At regional level, the regional cooperation alliances are being continued in the individual working areas. These bodies enable the stakeholders and users to take an active part in the planning process at an early stage by discussing specific problems and possible solutions in the region. Local authorities, interest groups, associations etc. are also involved in implementation through the regional forums held at regular intervals in the river catchment areas.

The regional cooperation alliances and regional forums inform the parties concerned about the implementation process and facilitate joint discussion of important steps in the process. The extended expert groups set up by the Lower Saxony Ministry of the Environment, Energy and Climate Protection are primarily concerned with matters relating to strategic implementation of the WFD. These official bodies also deal with important technical matters relating to the responsibilities of various municipal and technical authorities.

Further information on the river basin associations and the implementation of the WFD can be found on the websites of the individual river basin associations.

Table 68: List of websites of river basin associations

River basin association	Website
RBA Elbe	www.fgg-elbe.de and www.ikse-mkol.org
RBA Weser	www.fgg-weser.de
RBA Ems	www.ems-eems.de
RBA Rhine	www.fgg-rhein.de und www.iksr.org

Furthermore, all reports, inquiries and publications can be downloaded or have active links. In 2011 the brochure “Der Zukunft das Wasser reichen” provided the public with information on the contents of the Lower Saxony contributions to the management plans and programmes of measures for the Elbe, Weser, Ems and Rhine river basins (NLWKN 2011b). Information and various other publications can also be accessed on the websites of the Lower Saxony Ministry of the Environment, Energy and Climate Protection (www.umwelt.niedersachsen.de), the Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency (www.nlwkn.niedersachsen.de) and the WFD Information Exchange (wib) of the local authorities in Lower Saxony (www.wrrl-kommunal.de). For example, the wib website includes the brochures relating to the Lower Saxony water body competition “Bach im Fluss” (“Flowing Stream”) that has been held every two years since 2010. Articles by institutions or other initiatives about successful measures to develop Lower Saxony’s rivers, and also presentations and awards for such articles, are intended to provide encouragement to engage in similar activities.

9.2 Public inquiries – Evaluation and consideration of comments

The inquiries into the procedure and timing of the implementation of the WFD and into the major water management issues, the comments on which are dealt with by the river basin offices, were followed at the end of 2014 by the inquiry into the management plans and programmes of measures.

The public inquiry into the draft of the Lower Saxony contribution to the management plans 2015 to 2021 for the Elbe, Weser, Ems and Rhine river basins, and into the draft of the Lower Saxony contribution to the programmes of measures 2015 to 2021 for these river basins, was held during the period from 22.12.2014 to 22.06.2015.

In addition to the exhibition of the inquiry documents, public participation also included the presentation of the results of the 2013 inventory, the up-to-date status assessment of surface waters and groundwater, a comparison with the statements in the first management plan, and the strategies and measures for achieving the objectives by 2021 in the 28 regional cooperation alliances in Lower Saxony. The inquiry documents were also presented in the four state-wide regional forums by the Lower Saxony Ministry of the Environment, Energy and Climate Protection. The public participation process made it possible to inform numerous institutions, local authorities, associations, neighbouring federal states, and members of the general public and give them an opportunity to submit comments.

A total of 32 statements were received on the Lower Saxony contributions exhibited.

Of these, 23 statements related to the Lower Saxony contribution on the management plans, and 25 related to the Lower Saxony contribution on the programmes of measures. Statements concerned with the international and national management plans were passed on to the relevant office of the river basin association.
These statements were submitted in particular by the nature conservation associations, the maintenance associations in Lower Saxony, the agricultural sector and the Federal Waterways and Shipping Directorate. Only a small number of local authorities commented on the Lower Saxony contributions. No statements were received from private individuals.
These statements by the various stakeholders were to some extent of conflicting tenor with regard to their basic ideas (e.g. in relation to the principle of voluntariness) and also differed as a whole with regard to points of detail. They covered virtually the entire contents of the Lower Saxony contributions, both from a fundamental point of view and also with a highly differentiated approach to individual comments. Furthermore, numerous statements had the character of an appeal or provided pointers to the future concrete implementation of the WFD. The state was unable to follow up generalised remarks to the effect that the preparation of the plans was basically faulty. The Lower Saxony contributions were prepared in accordance with nationwide recommendations by the Joint Water Commission of the Federal States (LAWA).
Statements relating to possible incorrect information/wording, tables and maps were checked and, when necessary, taken as a basis for corrections.
In view of the statements, additional information was incorporated on contamination of standing waters (cf. Chapter 2.2.2) and on changes in strategies for achieving the environmental objectives (cf. Chapter 13.5). Moreover, the appendix to the present document was supplemented by a list of water-dependent Habitats Directive and Birds Directive areas (cf. Appendix D). The chapter “Ems Master Plan 2050” (cf. Chapter 8.2) was updated and the chapter “Pharmaceuticals in surface waters in Lower Saxony” (cf. Lower Saxony contribution to the programmes of measures 2015 to 2021 for the Elbe, Weser, Ems and Rhine river basins, Chapter 2.3.4).
In consultation with the Federal Waterways and Shipping Directorate (WSV) and the state of Bremen, a text description was provided of the following planned construction projects: development of the Outer and Lower Weser and the Ems, modification of the fairway of the Lower and Outer Elbe, and construction of the Bremerhaven offshore terminal (cf. Chapter 5.3.1).
The criticism that excessive use was made of deadline extensions was noted. However, this criticism did not result in any relevant changes, because the extensions were based on the statutory justifications of Section 29 of the Federal Water Act and there was no possible alternative.
Lower Saxony will continue its strategy of providing a standard range of offerings with regard to implementation of the measures in the second management period as well. With regard to demands by individual water users for divergent management objectives for certain rivers, it must be pointed out that Lower Saxony will actively pursue and intensify the process for identifying and justifying divergent management objectives on the basis of projects and experience to date (cf. Chapter 13.5).

In the context of the many demands for possible financing options/alternatives, attention is drawn to the prevailing legal and technical situation regarding compensation measures in the field of nature conservation, and to existing funding programmes and the wide range of financing options that already exist and can be used for implementing the measures.
A detailed analysis was prepared of the objections in all statements and a tabular summary was produced. The evaluation of the inquiry is published on the NLWKN website.
http://www.nlwkn.niedersachsen.de/startseite/wasserwirtschaft/egwasserrahmenrichtlinie/umsetzung_egwrrl/ergebnisse_anhoerung/ergebnisse_anhoerung_2014/ergebnisse-der-anhoerung-2014-129960.html

10 List of competent authorities

This chapter is concerned with the contents of the report pursuant to Article 3 (8) of the WFD. In view of the federal structures in Germany, responsibility for the implementation of the WFD rests with the federal states. Within the federal states, the implementation of the WFD is represented by the highest state authority for water management – usually a ministry (cf. Table 69). The body responsible for implementation of the WFD in Lower Saxony is the Lower Saxony Ministry of the Environment, Energy and Climate Protection (Niedersächsisches Ministerium für Umwelt, Energie und Klimaschutz).

Table 69: List of the competent authorities in the Elbe, Weser, Ems and Rhine river basins

Name of competent authority	Address of competent authority	Email addresses and website
Umweltministerium Baden-Württemberg	Kernerplatz 9 D-70182 Stuttgart	poststelle@um.bwl.de www.um.baden-wuerttemberg.de
Bayerisches Staatsministerium für Umwelt und Verbraucherschutz	Rosenkavalierplatz 2 D-81925 München	poststelle@stmuv.bayern.de www.stmuv.bayern.de
Senatsverwaltung für Stadtentwicklung und Umwelt	Württembergische Straße 6 D-10707 Berlin	info@senstadtum.berlin.de www.stadtentwicklung.berlin.de/umwelt/
Ministerium für Umwelt, Gesundheit und Verbraucherschutz des Landes Brandenburg	Heinrich-Mann-Allee 103 D-14473 Potsdam	poststelle@mugv.brandenburg.de www.mugv.brandenburg.de
Senator für Senator für Umwelt, Bau und Verkehr der Freien Hansestadt Bremen	Ansgaritorstr. 2, D-28195 Bremen	office@umwelt.bremen.de www.umwelt.bremen.de
Behörde für Stadtentwicklung und Umwelt der Freien und Hansestadt Hamburg	Neuenfelder Straße 19 D-21109 Hamburg	info@bsu.hamburg.de www.hamburg.de/bsu
Hessisches Ministerium für Umwelt, Klimaschutz, Landwirtschaft und Verbraucherschutz	Mainzer Straße 80 D-65189 Wiesbaden	poststelle@umwelt.hessen.de www.umweltministerium.hessen.de
Ministerium für Landwirtschaft, Umwelt und Verbraucherschutz Mecklenburg-Vorpommern	Paulshöher Weg 1 D-19061 Schwerin	poststelle@lu.mv-regierung.de www.lu.mv-regierung.de
Niedersächsisches Ministerium für Umwelt, Energie und Klimaschutz	**Archivstrasse 2 D-30169 Hannover**	**poststelle@mu.niedersachsen.de www.umwelt.niedersachsen.de**

Name of competent authority	Address of competent authority	Email addresses and website
Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen	Schwannstr. 3 D-40476 Düsseldorf	poststelle@mkulnv.nrw.de www.umwelt.nrw.de
Ministerium für Umwelt, Landwirtschaft, Ernährung, Weinbau und Forsten des Landes Rheinland-Pfalz	Kaiser-Friedrich-Straße 1 D-55116 Mainz	Poststelle@mulewf.rlp.de www.mulewf.rlp.de
Ministerium für Umwelt und Verbraucherschutz des Landes Saarland	Keplerstraße 18 D-66117 Saarbrücken	poststelle@umwelt.saarland.de www.saarland.de/umwelt
Sächsisches Staatsministerium für Umwelt und Landwirtschaft	Archivstraße 1 D-01097 Dresden	info@smul.sachsen.de www.smul.sachsen.de
Ministerium für Landwirtschaft und Umwelt des Landes Sachsen-Anhalt	Leipziger Straße 58 D-39112 Magdeburg	poststelle@mlu.sachsen-anhalt.de www.mlu.sachsen-anhalt.de
Ministerium für Energiewende, Landwirtschaft, Umwelt und ländliche Räume des Landes Schleswig-Holstein	Mercatorstraße 3 D-24106 Kiel	internetredaktion@melur.landsh.de www.schleswig-holstein.de/UmweltLandwirtschaft
Thüringer Ministerium für Landwirtschaft, Forsten, Umwelt und Naturschutz	Beethovenstraße 3 D-99096 Erfurt	poststelle@tmlfun.thueringen.de www.thueringen.de/tmlfun

11 Contact centres for background documents and information

The following background documents have been produced as part of the LAWA work programme for updating the management plans and programmes of measures:

- Entwurf einer Mustergliederung für den Bewirtschaftungsplan 2016 - 2021 nach WRRL
- Standardtexte für den digitalen Zwischenbericht nach Art. 15 (3) WRRL (WRRL 1.1; Stand: 06.06.2012)
- Handlungsempfehlung für die Aktualisierung der wirtschaftlichen Analyse (WRRL 2.1.1 und 2.5.2; Stand: 27.07.2012)
- Überprüfung und Aktualisierung der Bestandsaufnahme nach Wasserrahmenrichtlinie bis Ende 2013 -Kriterien zur Ermittlung signifikanter anthropogener Belastungen in Oberflächengewässern, Beurteilung ihrer Auswirkungen und Abschätzung der Zielerreichung bis 2021- (WRRL 2.1.2; Stand: 30.01.2013)
- Überprüfung und Aktualisierung der Bestandsaufnahme nach EG-Wasserrahmenrichtlinie bis zum 22. Dezember 2013 - Aktualisierung und Anpassung der LAWA-Arbeitshilfe zur Umsetzung der EG-Wasserrahmenrichtlinie, Teil 3, Kapitel II.1.2 -Grundwasser- (WRRL 2.1.6; Stand: 24.09.2013)
- Unterstützende Bewertungsverfahren Ableitung von Bewertungsregeln für die Durchgängigkeit, die Morphologie und den Wasserhaushalt zur Berichterstattung in den reporting sheets (WRRL 2.2.6; Stand: 11.07.2012)
- Handlungsempfehlungen zur Berücksichtigung grundwasserabhängiger Landökosysteme bei der Risikoanalyse und Zustandsbewertung der Grundwasserkörper (WRRL 2.2.7; Stand: 29.02.2012)
- Anlage Fortschreibung LAWA-Maßnahmenkatalog (WRRL, HWRMRL)(WRRL 2.3.3-Anlage; Stand: 24.01.2014)
- Begleittext Fortschreibung LAWA-Maßnahmenkatalog (WRRL, HWRMRL)(WRRL 2.3.3; Stand: 24.01.2014)
- Empfehlung zur Ausweisung HMWB/AWB im zweiten Bewirtschaftungsplan in Deutschland (WRRL 2.4.2; Stand: 26.02.2013)
- Hintergrundpapier zur Ausweisung HMWB/AWB im ersten Bewirtschaftungsplan und der Fortschreibung in Deutschland (WRRL 2.4.2; Stand: 24.08.2013)
- Harmonisierung der Herleitung des "Guten ökologischen Potenzials (GÖP)" (WRRL 2.4.2; Stand: 23.07.2012)

- Handlungsempfehlung für die Begründung von Fristverlängerungen mit unverhältnismäßigem Aufwand (WRRL 2.4.3; Stand: 30.05.2013)
- Handlungsempfehlung für die Ableitung und Begründung weniger strenge Bewirtschaftungsziele, die den Zustand der Wasserkörper betreffen (WRRL 2.4.4; Stand: 21.06.2012)
- Ableitung überregionaler Bewirtschaftungsziele in den Flussgebietseinheiten mit deutscher Federführung (WRRL 2.4.6; Stand: 10.08.2012)
- Bewertung des ökologischen Potenzials von künstlichen und erheblich veränderten Seen (WRRL 2.6.1; Stand: 30.01.2013)
- Empfehlungen zur koordinierten Anwendung der EG-MSRL und EG-WRRL (WRRL 2.7.6; Stand: 02.2014)

These papers can be found in the public section of the joint federal and Länder information and communication platform – “Wasserblick” – under the following link:
http://www.wasserblick.net/servlet/is/142651/

The basis for drawing up monitoring programmes is the LAWA framework concept for preparing monitoring programmes and assessing the status of surface waters „Rahmenkonzeption zur Aufstellung von Monitoringprogrammen und zur Bewertung des Zustands von Oberflächengewässern und von Grundwasserkörpern“ (RaKon):

Teil A: Eckpunkte zum Monitoring und zur Bewertung

- Rahmenkonzeption zur Aufstellung von Monitoringprogrammen und zur Bewertung des Zustands von Grundwasserkörpern - Eckpunkte - (Stand: 15.02.2005)
- Rahmenkonzeption zur Aufstellung von Monitoringprogrammen und zur Bewertung des Zustands von Oberflächengewässern Teil A: Eckpunkte zum Monitoring und zur Bewertung von Oberflächengewässern (Stand: 28.08.2012)
- Grundlagen zur Aufstellung von Monitoringprogrammen und zur Bewertung des Zustands von Oberflächengewässern (Stand: 15.02.2005)

Teil B: Bewertungsgrundlagen und Methodenbeschreibungen für Oberflächengewässer

- Arbeitspapier I: Gewässertypen und Referenzbedingungen (Stand: 17.10.2013)
- Arbeitspapier II: Hintergrund- und Orientierungswerte für physikalisch-chemische Qualitätskomponenten zur unterstützenden Bewertung von Wasserkörpern entsprechend EG-WRRL (Stand: 19.02.2014)
- Arbeitspapier III: Untersuchungsverfahren für biologische Qualitätskomponenten (Stand: 22.08.2012)

- Arbeitspapier IV.1: Untersuchungsverfahren für chemische und physikalisch-chemische Qualitätskomponenten Anlage 3: Analytik für Biota-Untersuchungen (Stand: 27.02.2013)
- Arbeitspapier IV.2: Empfehlung zur langfristigen Trendermittlung nach der Verordnung zum Schutz der Oberflächengewässer (Stand 27.02.2013)
- Arbeitspapier IV.3: Empfehlung für Schwebstoff- und Sedimentuntersuchungen an Überblicksmessstellen nach der Verordnung zum Schutz der Oberflächengewässer (Stand: 10.12.2013)
- Arbeitspapier VI: Ermittlung des guten ökologischen Potenzials - Fließgewässer (Stand: 21.08.2012)

These papers can be found in the public section of the joint federal and Länder information and communication platform – "Wasserblick" – under the following link:
http://www.wasserblick.net/servlet/is/42489/

The above papers are supplemented by the following publications, which can be downloaded from the NLWKN website:

- Monitoringkonzept Niedersachsen
- Gewässerüberwachungssystem (GÜN) Nährstoffe in niedersächsischen Oberflächengewässern – Stickstoff und Phosphor. Oberirdische Gewässer Band 35
- Die Landwirtschaft in Niedersachsen
- Die Ernährungswirtschaft in Niedersachsen
- Prognose der Auswirkungen einer nach Gewässerschutzaspekten novellierten Düngeverordnung auf die Qualität der Oberflächengewässer in Deutschland (Stand: 15.09.2014)
- Konzept zur Ableitung von Nährstoffreduzierungszielen in den Flussgebieten Ems, Weser, Elbe und Eider aufgrund von Anforderungen an den ökologischen Zustand der Küstengewässer gemäß Wasserrahmenrichtlinie (WRRL 2.3.4; Stand: 01.06.2011)
- Analyse weiterer Gewässerschutzmaßnahmen zur Reduzierung von Nährstoffeinträgen im Hinblick auf die Erreichung der Umweltziele nach EG-Wasserrahmenrichtlinie in Niedersachsen – Entwicklung eines Instrumentes für ein flussgebietsweites Nährstoffmanagement in Niedersachsen (AGRUM-Niedersachsen)
- Entwicklung eines Instrumentes für ein flussgebietsweites Nährstoffmanagement in der Flussgebietseinheit Weser (AGRUM^{+}-Weser)
- Leitfaden Maßnahmenplanung Oberflächengewässer Teile A bis D
- Dokumentation der niedersächsischen Modellprojekte
- Abschlussbericht zum Pilotprojekt Maßnahmenakquiseprojekt

- Vorschlag EU neue prioritäre Stoffe
- Untersuchung auf ausgewählte Pflanzenschutzmittel im Einzugsgebiet der Fuhse Bestandsaufnahme 2011
- Humanarzneimittel in Oberflächengewässern
- Definition des Ökologischen Potenzials in Übergangsgewässern
- Überblicksweise Überwachung des Emsästuars anhand der QK benthische wirbellose Fauna. Durchführung der Untersuchung und Bewertung der Oberflächenwasserkörper mit dem Ästuartypieverfahren in 2011
- Überblicksweise Überwachung des Weserästuars anhand der QK benthische wirbellose Fauna. Durchführung der Untersuchung und Bewertung der Oberflächenwasserkörper mit dem Ästuartypieverfahren in 2011
- Agrarumweltmaßnahmen in Niedersachsen
- Leitfaden für die Bewertung des mengenmäßigen Zustandes der Grundwasserkörper in Niedersachsen und Bremen nach EG-Wasserrahmenrichtlinie (WRRL)
- Konzept zur Berücksichtigung direkt grundwasserabhängiger Landökosysteme bei der Umsetzung der EG-Wasserahmenrichtlinie (2. Bewirtschaftungsplanzyklus) mit Karte und Tabelle
- Leitfaden für die Bewertung des chemischen Zustandes von Grundwasserkörpern in Niedersachsen und Bremen nach EG-Wasserrahmenrichtlinie (WRRL)
- Themenbericht Pflanzenschutzmittel -Wirkstoffe und Metaboliten im Grundwasser (Datenauswertung 1989 bis 2013)- Grundwasser Band 23
- Anwenderhandbuch für die Zusatzberatung Wasserschutz – Grundwasserschutz-orientierte Bewirtschaftungsmaßnahmen in der Landwirtschaft und Methoden zu ihrer Erfolgskontrolle- Grundwasser Band 21
- Globaler Klimawandel -Wasserwirtschaftliche Folgenabschätzung für das Binnenland- Oberirdische Gewässer Band 33 und 36
- Die Aufstellung des Maßnahmenprogramms nach Artikel 11 EG-Wasserrahmen-richtlinie im Land Niedersachsen: Untersuchungen zur Kosteneffizienz im Prozess der Maßnahmenauswahl. Studie der Universität Göttingen im Auftrag des Niedersächsischen Ministeriums für Umwelt und Klimaschutz
- Ökonomische Elemente der Europäischen Gewässerschutzpolitik: Umsetzung und Herausforderung in Niedersachsen

In addition, further information can be seen on the websites of the individual river basin associations (cf. Chapter 9.1, Table 68).
The following is a list of the contact centres in Lower Saxony that provide further information on the implementation of the WFD (cf. Table 70). As well as the NLWKN Directorate in Norden, these are the individual branches.

Table 70: List of contact centres in the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins

Name of contact centre	Address	Phone, fax and email address
Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz (Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency)		
NLWKN – Direktion	Am Sportplatz 23 26506 Norden	Tel.: 04931-947-0 Fax: 04931-947-125 Poststelle@nlwkn-nor.niedersachsen.de
NLWKN – Betriebsstelle Aurich	Oldersumer Straße 4826603 Aurich	Tel.: 04941-176-0 Fax: 04941-176-135 Poststelle@nlwkn-aur.niedersachsen.de
NLWKN – Betriebsstelle Brake-Oldenburg	Heinestraße 1 26919 Brake	Tel.: 04401-926-0 Fax: 04401-926-100 Poststelle@nlwkn-bra.niedersachsen.de
	Ratsherr-Schulze-Straße 10 26122 Oldenburg	Tel.: 0441-799-0 Fax: 0441-799-2655 Poststelle@nlwkn-ol.niedersachsen.de
NLWKN – Betriebsstelle Cloppenburg	Drüdingstraße 25 49661 Cloppenburg	Tel.: 04471-886-0 Fax: 04471-886-100 Poststelle@nlwkn-clp.niedersachsen.de
NLWKN – Betriebsstelle Hannover-Hildesheim	Göttinger Chaussee 76 A 30453 Hannover	Tel.: 0511-3034-02 Fax: 0511-3034-3060 Poststelle@nlwkn-h.niedersachsen.de
	An der Scharlake 39 31135 Hildesheim	Tel.: 05121-509-0 Fax: 05121-509-196 Poststelle@nlwkn-hi.niedersachsen.de
NLWKN – Betriebsstelle Lüneburg	Adolph-Kolping-Straße 6 21337 Lüneburg	Tel.: 04131-8545-400 Fax: 04131-8545-444 Poststelle@nlwkn-lg.niedersachsen.de
NLWKN – Betriebsstelle Meppen	Haselünner Straße 78 49716 Meppen	Tel.: 05931-406-0 Fax: 05931-406-100 Poststelle@nlwkn-mep.niedersachsen.de
NLWKN – Betriebsstelle Stade	Harsefelder Straße 2 21680 Stade	Tel.: 04141-601-1 Fax: 04141-601-232 Poststelle@nlwkn-std.niedersachsen.de
NLWKN – Betriebsstelle Sulingen	Am Bahnhof 1 27232 Sulingen	Tel.: 04271-9329-0 Fax: 04271-9329-50 Poststelle@nlwkn-su.niedersachsen.de
NLWKN – Betriebsstelle Süd	Rudolf-Steiner-Str. 5 38120 Braunschweig	Tel.: 0531-8665-4000 Fax: 0531-8665-4050 Poststelle@nlwkn-bs.niedersachsen.de
	Alva-Myrdal-Weg 2 37085 Göttingen	Tel.: 0551-5070-02 Fax: 0551-5070-440 Poststelle@nlwkn-goe.niedersachsen.de
NLWKN – Betriebsstelle Verden	Bürgermeister-Münchmeyer-Str. 6 27283 Verden	Tel.: 04231-882-0 Fax: 04231-882-111 Poststelle@nlwkn-ver.niedersachsen.de

12 Summary/Conclusions

In accordance with the provisions of the Federal Water Act (Section 84), the management plans and programmes of measures are to be reviewed and updated every six years. Accordingly, the updated Lower Saxony contribution to the management plans for 2015 - 2021 for the Elbe, Weser, Ems and Rhine river basins is divided into two parts, in line with the requirements of the WFD and LAWA: Part I presents the updated assessment findings and the environmental/management objectives for surface waters and groundwater in Lower Saxony, while Part II describes the changes in content compared with the 2009 Lower Saxony contributions to the management plans.
Unlike 2008, the results are no longer presented in four contributions for Lower Saxony – one each for the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins –, but in a single report for the entire federal state. In parallel with this, there is also the Lower Saxony contribution to the programmes of measures 2015 - 2021 for the Elbe, Weser, Ems and Rhine river basins.

Chapter 1 provides a general description of the characteristics of the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins This also includes a list of the protected areas. Chapters 2 and 3 set out the findings of the updated inventory: Chapter 2 describes the pressures, and Chapter 3 the risk assessment findings. As a result, it can be concluded that diffuse pressures due to nutrients continue to be an obstacle to achieving the objectives for the majority of water bodies in the surface waters and groundwater sectors. In the case of groundwater bodies, the nitrate inputs from agricultural use were identified as a pressure. In addition to the pressures resulting from diffuse nutrient inputs, surface waters are also affected by hydromorphological changes and discharge regulation. For the second management period there is now also a greater focus on pressures due to pollutants in surface waters.

The monitoring programmes and the status assessment findings for the surface waters, groundwater and protected areas are described in Chapter 4. The fundamental objective of the WFD is to establish good chemical and ecological status or good ecological potential for surface water bodies, and good chemical and quantitative status for groundwater bodies. The current assessment findings show that only a very small number of surface waters have achieved good ecological status or good ecological potential. As a result of the infringement of the environmental quality standard for mercury in biota, all surface waters fail to achieve good chemical status. Other problematical substances include cadmium, tributyl tin, polycyclic aromatic hydrocarbons and fluoranthene.
The chemical status of half the 90 groundwater bodies in Lower Saxony is bad. By contrast, they all satisfy the management objectives regarding groundwater quantity.

Chapter 5 describes the major water management issues addressed at river basin level. On the basis of this information, Lower Saxony has identified key areas for achieving the objectives of the WFD. Central points for the second management plan continue to be reducing hydromorphological pressures and improving the continuity of many surface waters. They also include pollution by substances from mainly diffuse sources that act on surface water bodies and groundwater bodies and give rise to bad results. Reducing such pressures requires special efforts: although their causes are usually obvious, reducing them frequently requires considerable technical and financial resources or lengthy negotiations with users or polluters. The number of measures implemented in the first management period fell short of technical expectations. It also has to be noted that there is usually a timelag before measures make themselves felt. It is therefore necessary to apply for deadline extensions or divergent management objectives for the large number of water bodies that currently fall short of the WFD objectives. This is described in Chapter 5. In order to implement targeted measures for surface waters, the “Lower Saxony Water Alliance” was launched. At the same time, reducing diffuse nutrient inputs into surface waters and groundwater in Lower Saxony will be a key area during the second management period (cf. Lower Saxony contribution to the programmes of measures 2015 - 2021 for the Elbe, Weser, Ems and Rhine river basins).
Part I of the Lower Saxony contribution to the management plans is concluded by the summary of the economic analysis (Chapter 6) and of the programme of measures (Chapter 7), together with Chapters 8 to 11, which provide information about other planning activities and describe public involvement and opportunities for inspecting background information.
Part II (below) provides information on all major changes compared with the 2009 Lower Saxony contributions to the management plans. This also includes changes resulting from the latest assessment findings.

The Appendix shows the current assessment findings for each water body (surface waters and groundwater). Where technically meaningful, the results from 2008 are also shown. The Lower Saxony contribution to the management plans 2015 - 2021 for the Elbe, Weser, Ems and Rhine river basins also includes maps showing the classification of waters as heavily modified, artificial or natural water bodies and the assessment findings for surface waters and groundwater.

Part II

13 Summary of updates and changes compared with management plan 2009

13.1 Changes in water body shape, water body types, protected area updates

13.1.1 Surface waters

Changes in water body shape

Since 2009, changes to 134 water bodies have resulted in deletions, additions or changes in shape. These were due to technical reasons arising from findings about changes in pressures and from monitoring results and changes in the status of the water bodies in recent years. To a small extent there were also modifications resulting from changes in responsibility between the federal states in the case of transboundary water bodies.
113 new flowing water bodies for which Lower Saxony is responsible (country code DENI) were established, especially as a result of subdividing branched rivers. They were given other numbers and names: for example, the water body *08016 Dürre Holzminde/Hasselbach* was divided into *08030 Dürre Holzminde* and *08031 Hasselbach*. Old water bodies, like the water body *08016 Dürre Holzminde/Hasselbach*, were deleted from the statistics, resulting in a net increase of 50 flowing water bodies (cf. Table 71).
The transitional water body of the Elbe (*T1.5000.01*) is no longer reported by Lower Saxony, but by Schleswig-Holstein.
Heerter See is no longer listed as a lake within the meaning of the WFD. It is an artificial water body that was used as a settling pond for ore sludges. The sediment is 16 m thick and contains a high concentration of arsenic. In view of the high salt concentration, the assessment is very uncertain. Implementation of measures is not feasible in the future either, owing to the pollution.

Table 71: Overview of DENI water bodies 2008 and 2013 for surface waters

Water body categories	Number of DENI water bodies in 2008	Number of DENI water bodies in 2013
Flowing waters	1,512	1,562
Standing waters	28	27
Transitional waters	4	3
Coastal waters	13	13
Total surface water bodies	1,557	1,605

The boundary shifts between the water bodies do not have any influence on the statistics. The geometry of 19 rivers was lengthened or shortened, without any change in their number.

Changes in type

When updating the inventory, changes in type and location were made at approximately 80 water bodies in Lower Saxony. To a large extent this concerned the inland waterways, for example the Mittelland Canal, since in view of their widely differing hydrological situations these canals cannot be assigned to any particular type. However, most of the changes were made in the hill regions of Lower Saxony, since better estimates of the geochemical character of the rivers are now possible and/or more information is available. A relatively small number of changes relate to the lowland regions.

Changes in protected areas

Compared with 289 bathing waters in 2008, new registrations and de-registrations resulted in a net decrease to 277 bathing waters. There were only marginal changes in Birds Directive and Habitats Directive areas; these were due to a review of the state-wide notification of water-dependent Natura 2000 areas. Among other things, the lists of water-dependent habitat types occurring in Lower Saxony according to Annex I to the Habitats Directive and the water-dependent species according to Annex II to the Habitats Directive (as of 12/2014) were reviewed against the list of (ground)water-dependent registration units and sub-units of biotope types and allocation to habitat types, and modified where necessary. There were also new results from initial registration of Habitats Directive areas.

13.1.2 Groundwater

The number of groundwater bodies to be notified by Lower Saxony remains unchanged from 2009 at 90 groundwater bodies. The boundaries of the groundwater bodies were adjusted as part of the geometry review. The only large-scale change affected the groundwater body “Jeetzel Lockergestein rechts”. In this case, an area of about 8 square kilometres (about 1% of the total area) was assigned to an adjacent groundwater body in Mecklenburg-Western Pomerania, owing to a redefinition along the current course of the Elbe axis.

13.2 Changes in significant pressures and anthropogenic impacts

The pressures determined when updating the inventory in 2013 are essentially the same as those identified in 2008. Changes result from a modified and nationally harmonised approach to identifying the pressures, and from improvements in the data situation thanks to monitoring (cf. Chapter 2). There is no reliable technical evidence for an upward or downward trend in pressures as a result of measures implemented.

In addition to the changes in method, the aim is now to provide a more detailed description of the pressures which were defined in very compact form in 2009, and thereby give greater emphasis to the environmentally relevant activity giving rise to such pressures. For this reason a distinction will in future be made, e.g. in the case of diffuse sources, between diffuse sources resulting from agricultural activities and diffuse pressures originating from other sources (cf. Chapter 2).

13.2.1 Surface waters

13.2.1.1 Rivers and standing waters

By contrast with the situation in 2009, there are a few rivers in Lower Saxony for which the ongoing monitoring process has now reliably identified significant pressures due to discharges from sewage plants or to high chloride and sulphate concentrations (salt levels). In the case of standing waters, a point-source discharge on Steinhuder Meer was identified as a significant pressure.

With regard to pressures resulting from diffuse substance inputs, it continues to be the case that a large proportion of water bodies in Lower Saxony display high nutrient concentrations (nitrate and phosphate). In addition to the structural deficits affecting water bodies, nutrients play an important role. Intact aquatic flora and fauna require a nutrient situation virtually free from anthropogenic influences, since otherwise the hydromorphological improvements to the water bodies cannot have a lasting effect. Increased nutrient concentrations may impede or even prevent recolonisation by original species combinations.

In view of the ubiquitous mercury contamination in all water bodies (cf. Chapter 4.2.3), which comes from a variety of sources, it is assumed that all water bodies in Lower Saxony are affected by pressures due to pollutants from other diffuse sources. Other substances are also input into water bodies from other diffuse sources. Other diffuse sources include outputs from contaminated sediments, soils or abandoned industrial areas. Inputs via atmospheric deposition are subsumed under other diffuse sources.

There are also inputs of other substances, such as polycyclic aromatic hydrocarbons or tributyl tin, as a result of transport and infrastructure facilities not connected to the sewage system (ships, railways, motor vehicles, aircraft and their related infrastructures outside urban areas). In 2009, the pressures due to pollutant inputs were not described in such differentiated form.

The structural deficits affecting flowing waters are represented by the pressures due to water body development. These comprise all hydromorphological and discharge regulating changes that have been made to rivers in the past. In the case of standing waters, a distinction is now made between pressures due to discharge regulation, changes in or loss of bank and water meadow areas, and pressures due to fisheries and amateur fishing (cf. Chapter 2.2.2).

The following two tables provide an overview of the significant pressures in 2009 and 2013 for rivers and lakes.

Table 72: State-wide overview of pressures on flowing waters in 2009 and 2013

Type of pressure	Pressure exists?	Type of pressure	Pressure exists?
2009		**2013**	
Point sources	No	Municipal sewage plants	Yes
		Other point sources (salt)	Yes
Diffuse sources	Yes	Agricultural activities (through seepage, erosion, discharge, drainage, changes in farming methods, afforestation)	Yes
		Transport and infrastructures not connected to sewage systems (ships, railways, motor vehicles, aircraft and the relevant infrastructures outside urban areas)	Yes
		Pollutants from other diffuse sources	Yes
Water abstraction from flowing waters without reintroduction	No	Water abstraction from flowing waters without reintroduction	No
Discharge regulation and morphological changes	Yes	Water body development	Yes
Miscellaneous anthropogenic pressures	No	Miscellaneous anthropogenic pressures	No

Table 73: State-wide overview of pressures on lakes in 2009 and 2013

Type of pressure	Pressure exists?	Type of pressure	Pressure exists?
2009		**2013**	
Point sources	No	Rainwater relief	Yes
Diffuse sources	Yes	Agricultural activities (through seepage, erosion, discharge, drainage, changes in farming methods, afforestation)	Yes
		Transport and infrastructures not connected to sewage systems (ships, railways, motor vehicles, aircraft and the relevant infrastructures outside urban areas)	Yes
		Pollutants from other diffuse sources	Yes
Discharge regulation and morphological changes	Yes	Discharge regulation	Yes
		Changes in/loss of bank and water meadow areas	Yes
Miscellaneous anthropogenic pressures	No	Fisheries/amateur fishing	Yes
		Other anthropogenic pressures (use of mowing boats)	Yes

13.2.1.2 Transitional and coastal waters

Nutrients, especially nitrogen, continue to play a crucial role for transitional and coastal waters in the second management period. For this reason the pressures in this sector have not changed. The same applies to pressures resulting from discharge regulation and

morphological changes, which are now broken down in more detailed form, but continue to apply to all three transitional water bodies of the Weser and Ems.
Unlike the first notification for the 2009 management plan, the hydromorphological pressures in coastal waters are not as a whole regarded as significant in the 2015 management plan, which is in line with a good assessment of the hydromorphological situation. However, hydromorphological changes in transitional and coastal waters are still being investigated in various projects, e.g. in connection with the Marine Strategy Directive.
The following two tables provide an overview of the pressures in 2009 and 2013.

Table 74: State-wide overview of pressures on transitional waters in 2009 and 2013

Type of pressure	Pressure exists?	Type of pressure	Pressure exists?
2009		**2013**	
Point sources	No	Point sources	No
Diffuse sources	Yes	Agricultural activities (through seepage, erosion, discharge, drainage, changes in farming methods, afforestation)	Yes
		Transport and infrastructures not connected to sewage systems (ships, railways, motor vehicles, aircraft and the relevant infrastructures outside urban areas)	Yes
		Pollutants from other diffuse sources	Yes
Discharge regulation and morphological changes	Yes	Water body development	Yes
		Changes in/loss of bank and water meadow areas	Yes
		Dredging/ wet excavation	Yes
Miscellaneous anthropogenic pressures	No	Miscellaneous anthropogenic pressures	No

Table 75: State-wide overview of pressures on coastal waters in 2009 and 2013

Type of pressure	Pressure exists?	Type of pressure	Pressure exists?
Point sources	No	Point sources	No
Diffuse sources	Yes	Agricultural activities (through seepage, erosion, discharge, drainage, changes in farming methods, afforestation)	Yes
		Transport and infrastructures not connected to sewage systems (ships, railways, motor vehicles, aircraft and the relevant infrastructures outside urban areas)	Yes
		Pollutants from other diffuse sources	Yes
Discharge regulation and morphological changes	Yes	Discharge regulation and morphological changes	No
Miscellaneous anthropogenic pressures	No	Miscellaneous anthropogenic pressures	No

13.2.2 Groundwater

The update of the inventory in 2013 confirmed the diffuse pressures due to nutrients (nitrate) and crop protection agents. Both the results of the emission calculations and the survey of groundwater quality indicate a high risk that many groundwater bodies will fail to comply with the threshold values for nitrate in groundwater. Upward trends in nitrate in groundwater, especially in the permeable geest regions, also indicate ongoing pollution with nitrates. There are also conspicuous findings of cadmium in groundwater. These findings had not yet been identified at the time of the 2004 inventory, but have become known since the 2009 assessment.
With regard to the quantity criterion, no pressures were determined for Lower Saxony in 2013.

Table 76: State-wide overview of pressures on groundwater in 2009 and 2013

Type of pressure	Pressure exists?	Type of pressure	Pressure exists?
2009		**2013**	
Point sources	No	Point sources	No
Diffuse sources	Yes	Agricultural activities (e.g. use of fertilisers and crop protection agents, livestock farming etc.)	Yes
		Pollutants from other diffuse sources	Yes
Groundwater abstraction	No	Groundwater abstraction	No
Artificial groundwater recharge	No	Artificial groundwater recharge	No

In individual groundwater bodies in the north-eastern part of Lower Saxony, a large number of groundwater abstraction cases, especially for field watering purposes, and the trends identified at groundwater measuring stations gave rise to fears that the objectives would not be achieved.
For this reason, several projects were carried out to improve knowledge, and especially our understanding of the water resource system in groundwater bodies (No Regret, Aquarius, Wuhlbeek project). At the present time, there are no fears of failure to achieve the objectives on the basis of the findings available. There is also considered to be a need to improve the knowledge base with regard to the groundwater bodies in western and central Lower Saxony that were classified by the risk assessment as unclear or at risk with regard to the achievement of objectives in 2021.

13.3 Update of assessment regarding risk of failure to achieve objectives

13.3.1 Surface waters

The main difference between the review and update of the inventory in 2013 and the 2004 inventory lies in the fact that it is now possible to make use of the results of monitoring

programmes complying with the requirements of the WFD, i.e. a largely reliable and uniform database of the quality elements in accordance with the WFD. The risk assessment was not updated for the preparation of the 2009 management plan. Considerable progress has been made with developing the sampling and assessment procedures. To some extent, however, there is still a need for further development work, since intensive use of the procedures in the federal states is expected to yield further results that will have to be incorporated in the methods to achieve further improvements in reliability and accuracy. Considerable differences therefore exist.

Since the first inventory, there is now not only a sound basis of data on the biological quality elements, but also more experience gained from the planning and implementation of measures. Experience in recent years has shown that there is a need to step up efforts in the field of implementation of measures. Not all water bodies in Lower Saxony have the same preconditions for further development (cf. Chapter 13.5). The latest findings on substance pollution by nutrients indicate the need for action on this front as well. Only surface waters that currently possess good ecological status/potential are expected to show no deterioration and to achieve the objective in 2021.

The basis for assessing chemical status has undergone far-reaching changes since the first inventory. The assumed ubiquitous contamination with mercury in biota also results in achievement of the chemical objective in 2021 being classified as unlikely for all surface waters. A comparison therefore has no information value.

Table 77: State-wide overview of risk assessment for surface waters in 2004 and 2013 – Ecological and chemical aspects

	2004	
	Ecology	**Chemicals**
Achievement in 2015 probable	277	209
Achievement in 2015 uncertain	975	681
Achievement in 2015 improbable	283	38
Achievement in 2015 unclear/no data available	21	628
	2013	
	Ecology[64]	**Chemicals**
Achievement in 2021 probable	33	–
Achievement in 2021 uncertain	–	–
Achievement in 2021 improbable	1,529	1,605
Achievement in 2021 unclear/no data available	40	–

Since the expectations with regard to achievement of the ecological and chemical environmental objectives are summarised on the basis of the worst-case principle, the comparison of the assessments for 2004 and 2013 reveals the following picture.

[64] The three coastal water bodies outside the one-mile zone are not assessed from an ecological point of view.

Table 78: State-wide overview of risk assessment for surface waters in 2004 and 2013 – Overall assessment

	Total
	2004
Achievement in 2015 probable	277
Achievement in 2015 uncertain	975
Achievement in 2015 improbable	283
Achievement in 2015 unclear/no data available	21
	2013
Achievement in 2021 probable	–
Achievement in 2021 uncertain	–
Achievement in 2021 improbable	1,605
Achievement in 2021 unclear/no data available	–

13.3.2 Groundwater

The main difference between the inventory review and update in 2013 and the inventory made in 2004 lies in the fact that the extension of the quality measurement network with the relevant analytical facilities can make use of an improved database and longer observation series, and thus provides a more reliable basis for assessment. The assessment method for the quantitative dimension, especially with regard to the relevant environmental goods, was to some extent only developed or updated after the 2004 inventory. It is now possible to make a detailed assessment of each of the environmental goods listed under Section 4 (2) of the Groundwater Ordinance.

The findings obtained from the No Regret, Aquarius and Wuhlbeek projects have resulted in a better understanding of the behaviour of the water resource system. This applies particularly to the groundwater bodies in the north-east of Lower Saxony for which achievement of the objectives was classified as improbable in 2004.

In some areas, however, there is a need for further development work on the methods, e.g. to assess the surface waters connected to the groundwater with a view to further increases in reliability and robustness.

Table 79: State-wide overview of risk assessment for groundwater in 2004 and 2013 – Qualitative and quantitative aspects

	2004	
	Quality	**Quantity**
Achievement in 2015 not endangered	31	83
Achievement in 2015 uncertain	–	–
Achievement in 2015 endangered	59	7
Achievement in 2015 unclear/no data available	–	–
	2013	
	Quality	**Quantity**
Achievement in 2021 not endangered	15	86
Achievement in 2021 uncertain	–	–
Achievement in 2021 endangered	55	1
Achievement in 2015 unclear/no data available	20	3

Since the expectations with regard to achievement of the chemical and quantitative environmental objectives are summarised on the basis of the worst-case principle, the comparison of the assessments for 2004 and 2013 reveals the following picture.

Table 80: State-wide overview of risk assessment for groundwater in 2004 and 2013 – Overall assessment

	Total
	2004
Achievement in 2015 not endangered	31
Achievement in 2015 uncertain	-
Achievement in 2015 endangered	59
Achievement in 2015 unclear/no data available	-
	2013
Achievement in 2021 not endangered	15
Achievement in 2021 uncertain	-
Achievement in 2021 endangered	55
Achievement in 2021 unclear/no data available	20

13.4 Additions and updates to assessment methods and monitoring programme, changes in status assessment with reasons

13.4.1 Surface waters

13.4.1.1 Additions and updates to monitoring programme for surface waters

Compared with the 2009 management plan there are changes in the number of measuring points shown. The measuring concept is not rigid. For one thing the concept had to take account of the monitoring requirements specified in the Surface Waters Ordinance of 26 July 2011, and for another, a number of changes resulted from initial experience gained when carrying out the monitoring investigations. The monitoring programme will continue to be modified in the light of ongoing developments and experience, e.g. as a result of new or revised legislation such as the transposition of Directive 2013/39/EU. The ongoing process of European coordination of assessment methods (intercalibration) may also result in adjustments to the measuring concept in the future. In the case of transitional and coastal waters, the requirements of the Marine Strategy Framework Directive (MSFD) will have to be taken into account in future in the further development of the monitoring programmes.

13.4.1.2 Updates to assessment methods, changes in status assessment

With the start of the second management plan cycle, a comparison between the assessments of the water bodies becomes possible for the first time. This comparison is intended to show the changes in pressures and the impacts of measures.
In the case of surface waters, however, it turns out that a comparison of the assessment results is only possible for some of the water bodies, owing to the various changes in the assessment methods.
The following methodological changes were made in the assessment procedures (cf. Chapter 4.2):

- Changes in the biological assessment procedures, e.g. owing to further progress with intercalibration of the assessment methods,
- Use of the new method to determine ecological potential,
- Changes in the basis for assessing chemical status.

As regards ecology, only water bodies which were designated as natural water bodies in both 2008 and 2013 can be compared in Lower Saxony on a methodologically sound basis. There have been no significant changes in the biological assessment procedures for assessing ecological status. It is also possible to compare the assessment results for water bodies that were declared as heavily modified in 2008 and are now classified as natural water bodies, since in 2008 the heavily modified water bodies in Lower Saxony were also assessed using the methods for ecological status assessment.

In the case of standing waters, the assessment procedures have changed as a result of intercalibration.
A detailed list of the changes in the assessment procedures can be found in Appendix (A-1).

13.4.1.3 Ecology

Flowing waters

A comparison of ecological assessments for all flowing waters in Lower Saxony is not technically correct as a result of changes in methods, because the method for assessing ecological potential has since been introduced. In 2008, artificial and heavily modified flowing waters were also assessed using the methods for ecological status assessment.
Despite these methodological differences, the following table shows the results for 2008 and 2014 on a purely numerical basis. Table 81 shows that the change in methods does not give rise to any fundamental changes in the assessment results. On the whole, the majority of water bodies fail to achieve the ecological management objectives.

Table 81: Comparison of ecological assessment results for 2008 and 2014 for all rivers in Lower Saxony

CLASS (status/potential)		2008	2014
2	Good	4%	2%
3	Moderate	23%	27%
4	Poor	43%	44%
5	Bad	30%	24%
No assessment possible		0%	3%

The comparison of the assessment results for the natural water bodies and for those water bodies which were classified in 2008 as heavily modified, but are now shown as natural, reveals the following picture.

Table 82: Comparison of assessment results from 2008 and 2014 for ecological status – Flowing waters

	Number of water bodies	Change by		
		1 class	2 classes	3 classes
Assessment result unchanged	162	–	–	–
Assessment result improved	74	71	1	2
Assessment result deteriorated	117	97	17	3

A comparison is possible for 353 water bodies. There has been no change in the majority of water bodies. The ecological status of 74 flowing waters has improved by one or more classes, and 117 water bodies show a deterioration in ecological status. Table 96 in

Appendix A-4 shows the assessment results for 2008 and 2014 for those flowing water bodies where a comparison of assessment results is possible from a methodological point of view.
Only in a very few cases can the changes be explained by the impacts of measures or changes in pressures. In most cases the result has changed because the monitoring process has become more extensive and hence more reliable. More components have been investigated in recent years. Furthermore, the monitoring results are also influenced by natural fluctuations in the biological quality elements.
It is also important to remember that the impacts of the measures implemented are not felt immediately, and that considerably more measures must be implemented on the water bodies to achieve a change in status. Improving a water body is a very complex and demanding objective which relates not only to the measure as such, but especially to its impact on the aquatic flora and fauna. Moreover, the success of renaturing measures is demonstrably dependent on the location of the measures, their scale and the order in which they are carried out. Another important factor for the success of measures is a water body maintenance system geared to the changed structure of the water body.
In the first management period, priority was given to measures for restoring continuity. To achieve successes within the meaning of the WFD, it is will be necessary in the second management period to focus more on measures requiring larger areas, or measures that permit the development of small-scale structures in the water body, and measures to reduce inputs of substances such as sand or nutrients (cf. Chapter 13.5).

Standing waters

The following table compares the assessment results for the first management period with those for the second management period. This makes it possible to identify changes in the assessment of ecological status/potential for standing waters. In the case of standing waters as well, it should be noted that changes have been made in the assessment methods which have to be considered when comparing the results.
Changes were made regarding the Hieve and the Zwischenahner Meer, which had hitherto been notified with HMWB status. Both lakes are of natural origin and can be classified as natural water bodies:

Table 83: Comparison of ecological assessments for standing waters in 2008 and 2014

Standing waters	Assessment result 2008	Assessment result 2014
Gartower See	Poor	Moderate
Koldinger Kiessee	Good	Moderate
Dümmer	Poor	Bad
Balksee	Moderate	Bad
Bederkesaer See	Moderate	Bad
Dahlemer/Halemer See	Moderate	Poor
The ecological assessments for the remaining 21 lakes were unchanged		

The deterioration in the ecological assessments for the natural lakes are partly explained by stricter assessment of the shallow lakes (subtype 11.2) as an adjustment in response to the intercalibration process. These changes are also partly due to the individual fluctuation ranges of highly eutrophic lacustrine ecosystems. The special hydromorphological property of shallow depth gives rise to intensified exploitation of nutrients and a – non-linear – hysteresis relationship between nutrient content and algal development in the lake: The "bistable character" of shallow lakes which are dominated either by submerged macrophytes or by phytoplankton. Experience shows that since the assessment methods are optimised particularly for the high/good and good/moderate thresholds, differences in weather conditions from year to year can give rise to considerable ranges of variation in the exploitation of trophic potential, which explains the negative deviations in the assessments for Dümmer, Dahlemer-Halemer See, Balksee and Bederkesaer See.
Since Gartower See in the form of the Seege river lake lies in the backwater or flooding area of the Elbe, it is subject to substantial variations in nutrient inputs and/or discharges depending on the flood event, and this can cause a change between two status classes.
Even if the biological quality element "phytoplankton" indicates a good ecological status for the gravel pit lake Koldinger Kiessee, the element "macrophytes/phytobenthos" currently shows only a moderate status. Marked feeding traces on the lake bed have adverse effects on the development of macrophytes and suggest the need for fishery measures.
In view of the remediated catchment areas with low anthropogenic influences, the reservoirs of the Western Harz and the excavated lakes Baggersee Schladen and Salzgittersee with low diffuse nutrient pollution from their surface catchment areas continue to display good status. The good status of the "Ewiges Meer" as the largest natural high moorland lake is also due to the low level of anthropogenic pressures.
Since it was not possible to implement quality improvement measures at the other lakes classified in the first management period as moderate to poor, or such measures have yet to make their impact felt, no improvement could be expected here.

Transitional and coastal waters

The assessment results for the first and second management periods are compared for transitional and coastal waters as well. This makes it possible to identify changes in the assessment of ecological status/potential for transitional and coastal waters. No changes in status were made for transitional and coastal waters.

Table 84: Comparison of ecological assessments for transitional waters in 2008 and 2014

Transitional waters	Assessment result 2008	Assessment result 2014
Transitional water body Ems (Leer to Dollart)	Bad	Poor
Transitional water body of Ems estuary	Moderate	Moderate
Transitional water body of Weser	Moderate	Moderate

The improved assessment relates to the water body "Übergangsgewässer Ems (Leer bis Dollart)", which had previously been assigned a bad ecological potential. The change to poor

potential is due to a change in the assessment method for benthic invertebrates with adjustments to ecological potential assessment – and thus reflects a methodological change. The transitional water body of the Weser and the transitional water body of the Ems estuary show no change in ecological assessment class compared with the previous management period. It may be assumed that the pressure situation there has remained unchanged.

Table 85: Comparison of ecological assessments for coastal waters in 2008 and 2014

Coastal waters	Assessment result 2008	Assessment result 2014
Wadden Sea of Jadebusen and adjacent sections of coast	Moderate	Poor
Western Wadden Sea of Weser	Moderate	Poor
Open coastal waters of Weser	Moderate	Poor
Eastern Wadden Sea of Weser	Moderate	Poor
Euhaline open coastal waters of Ems	Moderate	Poor
Euhaline Wadden Sea of Ems	Poor	Poor
Western Wadden Sea of Weser	Poor	Poor
Open coastal waters off Jadebusen	Moderate	Moderate
Euhaline Wadden Sea of Ems	Moderate	Moderate
Polyhaline open coastal waters of Ems estuary	Moderate	Moderate

In the coastal waters sector, five water bodies have bader assessments of ecological status. This situation is largely (in four cases) due to further development and adaptation and to European harmonisation of assessment methods for the quality element “phytoplankton”, but also illustrates the ongoing problem of high nutrient concentrations in coastal waters.
In the Western Wadden Sea of the Weser, not only the phytoplankton but also the bader assessment of macrophytes (in this case sea grasses) contributes to the bader assessment of the ecological status of this water body. The reason for this is an updated – water body specific – allocation of the monitoring results. For the assessment in 2008 the water bodies of the Western and Eastern Wadden Sea of the Weser were assessed together as far as macrophytes were concerned.
Five coastal water bodies display no change in ecological assessment class compared with the previous management period. In these cases it can be assumed that the pressure situation in the water bodies has essentially remained unchanged. Here impacts of improvement measures have yet to result in upgrading to a higher class in the five stage assessment system.

13.4.1.4 Chemicals

A comparison between the assessment results for 2008 and 2014 is not possible, because there have been fundamental changes in the basis for assessment (cf. Chapter 4.2.3). In 2008 the assessment of chemical status in Lower Saxony was performed on the basis of the European environmental quality standards that were statutory at that time, namely those in Schedule 5 of Annex IX, the “chem list”, to the Lower Saxony ordinance of 27 July 2004 on

the regulatory framework for water legislation. After the presentation of the 2009 management plan, Directive 2008/105/EC was transposed into national law in the Surface Waters Ordinance. The monitoring system in Lower Saxony was modified accordingly and the assessment system was prepared for updating the management plan. As a result of the Directive of the European Parliament and the Council amending priority substances and environmental quality standards (Directive 2013/39/EU), which was passed in August 2013, the basis for assessing chemical status is currently being revised.
Owing to the changes in environmental quality standards, the changes in method are so far-reaching that a comparison of the results does not yield any new findings. Because of the ubiquitous basic pressure arising from mercury in biota, the chemical status of all surface waters is “not good”.

13.4.2 Groundwater

13.4.2.1 Additions and updates to monitoring programme for groundwater

There are no significant additions with regard to the quantitative and qualitative investigation programmes for groundwater. The inventory of groundwater measuring stations for monitoring purposes was updated and known deficits in the measuring networks were eliminated.

13.4.2.2 Updates to assessment methods, changes in status assessment

In the assessment of groundwater quality there were no changes in assessment methods for any of the parameters. The comparison of assessments for 2008 and 2014 essentially confirms the pressure situation on the quality front in Lower Saxony. Since there were no changes in the geometry of the groundwater bodies or in the assessment methods, the differences in the extent to which the status assessment of groundwater bodies was affected is due to the improved and updated basic data. This applies both to the groundwater quality data collected and to the emission calculations. There were no significant changes with regard to the assessment methods for quantity. For information on updates to the assessment methods for quantity, see Chapter 4.3.2, in which the basic information also applies to the updating of status assessments from 2008 to 2014.

Table 86: Comparison of assessment results for groundwater bodies in 2008 and 2014

	Assessment of chemical status Number of GWBs	
	2008	2014
Total		
Good chemical status	47	46
Bad chemical status	43	44
Nitrate		
Good chemical status (nitrate)	51	48
Bad chemical status (nitrate)	39	42

	Assessment of chemical status Number of GWBs	
	2008	2014
Crop protection agents		
Good chemical status (pesticides)	80	80
Bad chemical status (pesticides)	10	10
Other pollutants		
Good chemical status (other pollutants)	81	82
Bad chemical status (other pollutants)	9	8
	Assessment of quantitative status Number of GWBs	
	2008	2014
Total		
Good quantitative status	90	90
Failing to achieve good	0	0

A change in the chemical status of the groundwater since the first management plan was found in a total of five groundwater bodies:

- Upper Ems, left (Plantlünner Sandebene West)
- Hase, right, solid rock
- Oker unconsolidated rock, left
- Ise unconsolidated rock, left
- Land Hadeln unconsolidated rock

The chemical status of the groundwater bodies “Obere Ems links (Plantlünner Sandebene West)”, “Hase rechts Festgestein” and “Oker Lockergestein links” was assessed as “good” in the first management plan, but has to be classified as “bad” in the second management plan (2014). In the case of the groundwater bodies “Obere Ems links (Plantlünner Sandebene West)”, “Hase rechts Festgestein” and “Oker Lockergestein links”, the deterioration is due to an increase in nitrate concentrations, which exceed the threshold values in the Groundwater Ordinance.
An improvement in chemical status from the first management plan to the second was found in the case of the groundwater bodies “Ise Lockergestein links” and “Land Hadeln Lockergestein”. In the management plan 2009 the nitrate concentrations in the groundwater body “Ise Lockergestein links” and the concentrations of crop protection agents in the groundwater body “Land Hadeln Lockergestein” exceeded the threshold values. The concentrations in the current assessment were lower, which is why the chemical status of these groundwater bodies was classified as “good”.

13.5 Changes in strategies for achieving environmental objectives and for making use of deadline extensions and divergent management objectives

The implementation of the objectives of the WFD is based on the basic and supplementary measures. In Lower Saxony the further development of the basic measures (primarily statutory provisions) takes place in cooperation with the other federal states and the federal level. A topical example here is the revision of the Fertilisers Ordinance. The federal states belonging to the Elbe River Basin Association have published a position paper on this subject (FGG Elbe 2014b). Success with reducing nutrient inputs into the groundwater and surface waters depends to a large extent on making rigorous use of the existing regulatory instruments. Sustainable achievement of the objectives of the WFD is not possible without effective contributions by the agricultural sector.
The supplementary measures explained in the Lower Saxony contribution to the programmes of measures for the river basins are also presented in the second management period as a planned range of offerings. They are implemented on a voluntary basis. In the course of the first management period it emerged that the efforts to date are not yet sufficient to achieve the objectives set out in the WFD.

In the case of surface waters, the framework conditions and guidelines for the planning and implementation of measures in Lower Saxony are set out in the “Guide to planning of measures for surface waters, Part D – Strategies and approaches for achieving the management objectives for rivers in Lower Saxony” (cf. Chapter 11, NLWKN 2011c). The aim of the guide is to ensure that the various guidelines that already exist in Lower Saxony for the planning and implementation of measures on flowing waters are geared even more rigorously to the requirements of the WFD, and to supplement them and merge them on an overarching basis.
A new aspect for the second management period is a strong focus of implementation on waters that have a high recolonisation potential and currently have a moderate ecological status/potential. In cooperation with the maintenance associations, it is planned to acquire and implement more measures on these waters during the second management period. The “Lower Saxony Water Bodies Alliance” has been launched for this purpose.
Following the conceptual elaboration of the nutrients complex in the first management period, 2013 saw the launch of a pilot advisory service for agriculture – linked to the groundwater advisory service – to reduce nutrient inputs into flowing waters. In the catchment area of the Hunte, an advisory service for reducing phosphate inputs from the agricultural sector is also being offered with the aim of rehabilitating the Dümmer lake.
The new agro-environmental programme of Lower Saxony and Bremen now also includes agro-environmental measures aimed at controlling nutrient inputs into bodies of water. New additions include measures for the establishment of green strips for water erosion control and conservation of water bodies. Without marked reductions in nutrient inputs into inland

waters, it will not be possible to achieve the environmental objectives for coastal and transitional waters.
In cooperation with Lower Saxony's nature conservation administration, greater importance will also be attached to the field of water meadows in the years ahead, since water meadows are of great significance for the objectives of the WFD and for the implementation of Natura 2000 (cf. Lower Saxony contribution to the programmes of measures 2015 to 2021 for the Elbe, Weser, Ems and Rhine river basins, NLWKN 2014b).
In the groundwater sector, the agricultural advisory service which was started in 2010 to reduce nitrate inputs into the groundwater will be continued. The target context will still be based on the assessment results for the parameter "nitrate". To be successful, it is essential that the advisory service should remain established on a long-term basis. In parallel with the updating of the management plan, the development programme for assisting rural areas for the EU promotion period 2014-2020 is being redesigned. The latest findings from experience in the groundwater conservation sector will be incorporated.
Moreover, as described in Chapter 5.3, an extension of the deadline until 2027 is being claimed for almost all water bodies in Lower Saxony. As in the first management plan, divergent management objectives for the cadmium pollution in the Harz water bodies are being claimed in a small number of cases on the basis of the chemical assessment.

In view of the current ecological status assessments, the experience gained from implementing measures, the resources available in the years ahead, and the existing social framework, discussions are also in progress in Lower Saxony about the possibility of claiming divergent management objectives for the third management period. Individual water users are demanding divergent management objectives, especially for water bodies with persistently bad ecological status/potential that have little or no ecological recolonisation potential, and for which measures will probably not result in objectives being achieved by the deadlines envisaged in the WFD. On the basis of the projects and experience to date in Germany and other European member states during the first management period, Lower Saxony will actively pursue and intensify the process of identifying and justifying the need for divergent management objectives. The ongoing discussions with the European Commission on this point will be taken into account.

13.6 Changes in uses of water and their impact on economic analysis

With regard to the economic requirements, the present management plan includes the following changes compared with the previous cycle. For the first time, the LAWA action recommendations for updating the economic analysis form the basis for a uniform approach to implementing the economic requirements.
The data for the economic analysis of water uses have been updated and prepared using a new method in Germany. This method prepares the data from the official statistics (for the first time) in a standardised nationwide procedure on the basis of river basin units by means of qualified control bands.
The baseline scenario has also been updated and adapted to the new reference here as far as possible. The evidence that water services cover costs has been amended in the light of the action against Germany for infringement of treaty obligations and in accordance with the latest research findings in Lower Saxony and Germany. The procedure for demonstrating the cost effectiveness of measures has also been adapted and to some extent supplemented in Lower Saxony.

13.7 Other changes and updates

No other changes or updates have been made.

14 Sources

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van Geel et al. (1994): Fossil akinetes of Aphanizomenon and Anabaena as indicators for medieval phosphate-eutrophication of Lake Gosciaz (Central Poland). Rev.Palaeobot.Palynol. 83(97):105.

Appendix

Appendix A – Surface water bodies

Appendix A-1: Changes in biological assessment procedure since the First Management Plan (LAWA, 2014)

Initial situation

As in the first management plan, the ecological assessment on the basis of the biological quality elements makes use of the assessment methods which were developed in Germany for implementing the WFD and which satisfy the relevant requirements. A brief description of all methods can be found in the RaKon Working Paper III "Methods for investigating biological quality elements"[65].

Assessment methods for natural water bodies (NWB)

Flowing waters

The assessment method for the quality element "phytoplankton" was taken over unchanged for the Second Management Plan. The method for the quality element "fish" (fiBS) was optimised with regard to age structure[66]. For the assessment methods "macrophytes and phytobenthos" (Phylib) and "benthic invertebrates" (PERLODES), the reviews planned for the management period were performed and minor adjustments made (e.g. list of taxa). These adjustments served to further optimise the assessment and improve the reliability and accuracy of the methods. As a rule, the resulting changes in the assessment relate only to individual water bodies, making the assessments more plausible. However, where there are changes in assessment between the first and second management plans, this may be due to other factors, such as a change in allocation of the flowing water type as a result of more recent findings.

Lakes

The phyto-lake index (phytoplankton) and PHYLIB (phytobenthos & macrophytes) were essentially used unchanged for the second management plan, but with additions for the few natural lakes in the central uplands[67]. The adjustments to biomass and algal class indices for the phyto-lake index serve to further optimise the assessment in correlation with the pressure parameter "trophic state" or "algal nutrients". With the exception of river lakes, the assessment using phytoplankton has become rather more stringent. In the Phylib method, the main change is that the diatom taxa list has been adjusted to take account of new

[65] LAWA (Bund/Länder-Arbeitsgemeinschaft Wasser) (2012): RaKon Monitoring Teil B. Arbeitspapier III "Untersuchungsverfahren für biologische Qualitätskomponenten". As of 22.08.2012

[66] Dußling, U. (2014): Documentation on fiBS – Version 8.1.1. Can be downloaded with Dußling (2014): fiBS 8.1 – Softwareanwendung, Version 8.1.1 zum Bewertungsverfahren aus dem Verbundprojekt: Erforderliche Probenahmen und Entwicklung eines Bewer-tungsschemas zur fischbasierten Klassifizierung von Fließgewässern gemäß EG-WRRL: http://www.lazbw.de/pb/,Lde/Startseite/Fischereiforschungsstelle/Wasserrahmenrichtlinie

[67] Riedmüller, U., Hoehn, E., Mischke, U., Deneke, R. (2013): Ökologische Bewertung von natürlichen, künstlichen und erheblich veränderten Seen mit der Biokomponente Phytoplankton nach den Anforderungen der EU-Wasserrahmenrichtlinie. Abschlussbericht für das LAWA-Projekt-Nr. O 4.10. Im Rahmen des Länderfinanzierungsprogramms „Wasser, Boden und Abfall" 2010. 154 S. zzgl. Anhänge.
Schaumburg, J., Schranz, C., Stelzer, D. (2011): Bewertung von Seen mit Makrophyten & Phytobenthos gemäß EG-WRRL – Anpassung des Verfahrens für natürliche und künstliche Gewässer sowie Unterstützung der Interkalibrierung.Bayerisches Landesamt für Umwelt, Endbericht im Auftrag der LAWA (Projekt Nr. O 10.09), 161 S, Augsburg/Wielenbach.

findings. Where there are changes between the first and second management plans, this may be due in both methods to natural fluctuations, but also to other factors such as changes in assignment of the lake water body type as a result of more recent findings with regard to water body typology, as documented among other things in the profiles of the German lake types[68]. The assessment of a number of lake types in all eco-regions has become rather more stringent as a result of adjustments to the method and the results of the intercalibration conducted in parallel.
The method for benthic invertebrates (AESHNA) was not available until the start of the second management plan[69] and is still undergoing practical testing, so most federal states have yet to report the results.
Assessment on the basis of fish fauna (DELFI-SITE)[70] is still in the test phase[71]. River lakes are still assessed using the fiBS method developed for flowing water assessment.

Coastal waters

The assessment methods for benthic invertebrates (MAMBI) and macrophytes, with the sub-components macroalgae, seagrass and salt meadows, are used unchanged in the second management plan[72].
In view of further developments resulting from harmonisation work in the course of European intercalibration, the assessment method for phytoplankton was adapted. These methodological adjustments give rise to changes in the assessment of certain coastal water bodies in the second management period. The methodological adjustments relate to changes in the methods for calculating sub-components for overall assessment of the quality element “phytoplankton”. The adjustments serve to optimise the assessment results and thereby improve the reliability of the assessment.

Assessment methods for artificial and heavily modified water bodies (HMWB and AWB)

Flowing waters

In recent years a benthic invertebrates assessment method for heavily modified flowing water bodies[73] has been developed and used in the second management plan. The fiBS method with an unchanged assessment algorithm is used for fish-based assessment of heavily modified water bodies and artificial water bodies. However, the reference fish cenoses of HMWBs/AWBs are adjusted appropriately with a view to the less ambitious

[68] Riedmüller, U., Mischke, U., Pottgiesser, T., Böhmer, J., Deneke, R., Ritterbusch, D., Stelzer, D. & Hoehn, E. (2013): Steckbriefe der deutschen Seetypen. – Begleittext und Steckbriefe. Im Auftrag des Umweltbundesamtes. http://www.umweltbundesamt.de/themen/wasser/seen

[69] Miler, O., Brauns, M., Böhmer, J. & Pusch, M. (2013): „Feinabstimmung des Bewertungsverfahrens von Seen mittels Makrozoobenthos. Abschlussbericht für das LAWA-Projekt-Nr. O 5.10. im Rahmen des Länderfinanzierungsprogramms „Wasser, Boden und Abfall“.

[70] Brämick, U., Ritterbusch D. (2010): Bewertungssystem für Seen anhand der Fische nach den Maßgaben der Wasserrahmenrichtlinie. Bericht des Instituts für Binnenfischerei, Potsdam-Sarcow

[71] In northern Germany, natural and heavily modified lakes are assessed on the basis of fish fauna using the TYPE method and not the SITE method. The SITE method, based on SITE-specific modelling, is used primarily in Alpine regions. Its suitability for lakes in North German low land areas is limited.

[72] NLWKN (2010): Umsetzung der EG-WRRL – Bewertung des ökologischen Zustands der niedersächsischen Übergangs- und Küstengewässer (Stand: Bewirtschaftungsplan 2009), Küstengewässer und Ästuare 1/2010, 59 S.

[73] Universität Duisburg-Essen & Planungsbüro Koenzen (2013): Handbuch zur Bewertung und planerischen Bearbeitung von erheblich veränderten (HMWB) und künstlichen Wasserkörpern (AWB), im Auftrag der LAWA (Stand Februar 2013).

management objectives. As with the previous development of the reference fish cenoses for natural water bodies, these adjustments were made by experts in the federal states.
The methods are based on those for natural water bodies. There is thus a standardised basis for these HMWBs/AWBs in Germany. The two methods also comply with the requirements of the WFD and are largely based on the European guidelines[74] (CIS Working Group 2.2 "HMWB" 2002). Compared with the first management plan, therefore, there may be methodological improvements in the assessment of HMWB flowing waters with the aid of fish and benthic invertebrates.
Progress has also been made with the assessment of marsh water bodies. For the first management plan, assessment of such water bodies was largely based on macrophytes and fish, since assessment methods for benthic invertebrates were not yet available or the practical testing of these methods had not yet been completed. In the meantime the development of methods for the benthic invertebrates has also been completed for the various sub-types of marsh water bodies, and the methods have been used for assessing water bodies in the second management plan.

Lakes

In the first management plan, artificial and heavily modified lake water bodies were largely assessed using only the biomass-oriented trophic index developed by LAWA[75]. A taxa-based assessment method was also developed for phytoplankton, but this was not used until the second management plan.
The extension of the method for assessing phytoplankton is of similar design to the method for natural lakes, since hydromorphological pressures in lakes do not usually have any considerable impacts on the trophic status and the phytoplankton in open water[76]. On the lines of the phyto-lake index, an additional module for acid opencast mining lakes was developed for the second management plan[77]. Compared with the first management plan, the change of method for phytoplankton assessment resulted in only minor changes.
In some federal states, the macrophyte and phytobenthos method is not used for AWBs until the second management plan. In the case of reservoirs (HMWBs) its use frequently does not make sense where substantial fluctuations in water level (> 3m) occur during the summer months. In the case of gravel pit lakes, there is no point in using the method until a stabilisation phase of 10-15 years has elapsed after the end of gravel operations.

[74] CIS-Arbeitsgruppe 2.2 „HMWB" 2002. Leitfaden zur Identifizierung und Ausweisung von erheblich veränderten und künstlichen Wasserkörpern.
[75] LAWA (Länderarbeitsgemeinschaft Wasser) (2001): Gewässerbewertung - Stehende Gewässer. Vorläufige Richtlinie für die Trophieklassifikation von Talsperren. Kulturbuchverlag, Berlin. 43 S. und
LAWA (Länderarbeitsgemeinschaft Wasser) (2003): Gewässerbewertung - Stehende Gewässer. Vorläufige Richtlinie für eine Erstbewertung von Baggerseen nach trophischen Krite-rien. Kulturbuchverlag, Berlin. 27 S.
[76] Riedmüller, U., Hoehn, E. (2011): Praxistest und Verfahrensanpassung: Bewertungsverfahren Phytoplankton in natürlichen Mittelgebirgsseen, in Talsperren, Baggerseen und pH-neutralen Tagebauseen zur Umsetzung der EG-Wasserrahmenrichtlinie. Abschlussbericht für das LAWA-Projekt-Nr. O 7.08. Im Rahmen des Länderfinanzierungsprogramms „Wasser, Boden und Abfall":
http://www.laenderfinanzierungsprogramm.de/cms/WaBoAb_prod/WaBoAb/index.jsp
[77] Leßmann, D., Nixdorf, B. (2009): Konzeption zur Ermittlung des ökologischen Potenzials von sauren Bergbauseen, BTU -. Brandenburgische Technische Universität Cottbus,
http://www.umwelt.sachsen.de/umwelt/wasser/download/BTU_Abschlussbericht_oekPotsaureBBSeen.pdf

For assessing the ecological potential of artificial and heavily modified lake water bodies, LAWA (Expert Group on Lakes[78]) has prepared and adopted a nationwide recommendation. This specifies which biological elements or sub-elements and methods are recommended for which types of artificial or heavily modified lakes in the presence of which main pressures. For this purpose the assessment methods for natural lakes were extended to some extent or modified to make it possible to use them for artificial and heavily modified lakes.

Transitional waters

The transitional waters of Ems, Weser and Elbe are classified as heavily modified water bodies. Methods for assessing the ecological potential have therefore been developed for all biological quality elements of the transitional waters – benthic invertebrates, macrophytes, phytoplankton and fish. It was found that the basic structure of the existing assessment procedures for all quality elements that initially related to the ecological status assessment of a water body could also be used for assessing ecological potential, and various modifications were made to this end[79]. As in the management plan 2009, the quality element "phytoplankton" was not used for transitional waters, since phytoplankton is not suitable for assessing this water body type (cf. RaKon III[80]).

The MAMBI method is used for assessing benthic invertebrates in the meso-/polyhaline areas of transitional waters, whereas the estuary type method is used for oligohaline areas. The overall assessment of benthic invertebrates is the result of merging the individual results. For assessing ecological potential, these methods were modified in respect of the references and the spectrum of species. The references in the assessment system were modified for macrophytes. For assessing the ecological potential of the fish fauna, the spectrum of species was modified and the references recalculated in the light of recent data.

The modified methods for assessing ecological potential comply with the requirements of the WFD and are based largely on the European guidelines[81].

[78] LAWA-Expertenkreis Seen (2013): Bewertung des ökologischen Potenzials von künstlichen und erheblich veränderten Seen. Verabschiedet im ständigen Ausschusses Oberirdische Gewässer und Küstengewässer (AO) der Bund/Länder-Arbeitsgemeinschaft Wasser (LAWA). Stand Januar 2013.

[79] Bioconsult (2014): Definition des ökologischen Potenzials in Übergangsgewässern – Theoretischer Hintergrund und Bewertungsmethoden für die Qualitätskomponenten nach WRRL. Im Auftrag von NLWKN Brake-Oldenburg, 112 S.

[80] LAWA (2012): RaKon III, Untersuchungsverfahren für biologische Qualitätskomponenten; Ausschuss „Oberirdische Gewässer und Küstengewässer".

[81] CIS Guidance Document (2005): Common Implementation Strategy for the Water Framework Directive (2000/60/EC) Guidance document No. 13. Overall approach to the classification of ecological status and ecological potential. Working Group 2A

Appendix A-2: Overview of the modifications resulting from Directive 2013/39/EU (LAWA, 2014)

The directive lays down stringent environmental quality norms for the following substances listed in Part A of Annex I to the directive: anthracene (No. 2), brominated diphenylether (No. 5), fluoranthene (No. 15), lead (No. 20), naphthalene (No. 22), nickel (No. 23) and polycyclic aromatic hydrocarbons (No. 28). With the exception of nickel and lead, these are already being used for chemical status assessment and the programmes of measures and management plans in the second WFD cycle.
The following individual steps were taken:

- Anthracene (No. 2): The value of the maximum allowable concentration (MAC-EQS) is reduced for all surface waters.
- Brominated diphenylether (No. 5): the EQS for the annual mean is deleted. Requirements are included for the maximum allowable concentration and for biota, based on fish.
- Fluoranthene (No.15): The environmental quality standards for the aqueous phase (both annual mean and maximum allowable concentration) are stricter. An environmental quality standard for biota, in relation to crustaceans and molluscs, is included.
- Lead and lead compounds (No. 20): The environmental quality standard for the annual mean is stricter. In the case of inland surface waters it relates to bioavailable concentrations. Furthermore, a value for the maximum allowable concentration has been introduced for all water bodies.
- Naphthalene (No. 22): The EQS value for the annual mean is reduced. A value for the maximum allowable concentration has also been introduced.
- Nickel and nickel compounds (No. 23): The EQS for the annual mean has been made stricter. In the case of inland surface waters the standard relates to bioavailable concentrations. Furthermore, a value for the maximum allowable concentration has been introduced for all water bodies.
- Polycyclic aromatic hydrocarbons (No. 28): This group of substances has been extensively restructured. The amending directive's EQS values for annual mean and for biota (crustaceans and molluscs) have been introduced and relate solely to benzo(a)pyrene. The EQS requirements for the annual mean for benzo(b)- and benzo(k)fluoranthene and for benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene no longer apply. Maximum allowable concentrations have been introduced for benzo(b)- and benzo(k)fluoranthene and for benzo(g,h,i)perylene.

Appendix A-3: Status of surface waters and assessment results Surface waters sorted by river basins

The following tables list the surface water bodies (rivers, lakes, transitional and coastal waters) for which Lower Saxony is responsible, broken down by the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins. The tables are concerned with water body status, ecological assessment and chemical assessment.

Water body status:

Table 87: Overview of the status of surface water bodies, broken down by the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins

Water body category	Total number of SWBs	of which NWBs	of which HMWBs	of which AWBs
Lower Saxony				
Flowing waters	1,562	358	878	326
Standing waters	27	11	8	8
Transitional waters	3	–	3	–
Coastal waters	13	13	–	–
Total SWBs	**1,605**	**382**	**889**	**334**
Lower Saxony part of RBU Elbe				
Flowing waters	275	47	173	55
Standing waters	5	4	1	–
Transitional waters	–	–	–	–
Coastal waters	1	1	–	–
Total SWB of RBU Elbe	**281**	**52**	**174**	**55**
Lower Saxony part of RBU Weser				
Flowing waters	964	305	514	145
Standing waters	16	3	6	7
Transitional waters	1	–	1	–
Coastal waters	6	6	–	–
Total SWB of RBU Weser	**987**	**314**	**521**	**152**
Lower Saxony part of RBU Ems				
Flowing waters	279	4	166	109
Standing waters	6	4	1	1
Transitional waters	2	–	2	–
Coastal waters	6	6	–	–
Total SWB of RBU Ems	**293**	**14**	**169**	**110**
Lower Saxony part of RBU Rhine				
Flowing waters	44	2	25	17
Total SWB of RBU Rhine	**44**	**2**	**25**	**17**

Ecological assessment of surface water bodies:

Table 88: Overview of ecological status/potential of surface waters, broken down by the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins

	Ecological status, number of NWBs – all surface waters –						Total number of NWBs
	High	Good	Moderate	Poor	Bad	No assessment possible	
Lower Saxony	**–**	**20**	**159**	**147**	**49**	**7**	**382**
Lower Saxony part of the Elbe RBU	–	–	29	17	5	1	52
Lower Saxony part of the Weser RBU	–	17	126	123	44	4	314
Lower Saxony part of the Ems RBU	–	3	3	6	–	2	14
Lower Saxony part of the Rhine RBU	–	–	1	1	–	–	2
	Ecological potential – number of HMWBs – all surface waters –						Total number of HMWBs
	Good		Moderate	Poor	Bad	No assessment possible	
Lower Saxony	**11**		**234**	**429**	**206**	**9**	**889**
Lower Saxony part of the Elbe RBU	–		53	96	21	4	174
Lower Saxony part of the Weser RBU	11		144	225	138	3	521
Lower Saxony part of the Ems RBU	–		32	95	41	1	169
Lower Saxony part of the Rhine RBU	–		5	13	6	1	25
	Ecological potential – number of AWBs – all surface waters –						Total number of AWBs
	Good		Moderate	Poor	Bad	No assessment possible	
Lower Saxony	**2**		**44**	**130**	**131**	**27**	**334**
Lower Saxony part of the Elbe RBU	–		13	24	15	3	55
Lower Saxony part of the Weser RBU	2		23	55	58	14	152
Lower Saxony part of the Ems RBU	–		5	41	54	10	110
Lower Saxony part of the Rhine RBU	–		3	10	4	–	17

Chemical assessment results for surface waters:

Table 89: Overview of chemical status of surface water bodies, including the results for mercury in biota, broken down by the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins

	Chemical status – all surface waters –	
	Good	Not good
Lower Saxony	–	**1,605**
Lower Saxony part of the Elbe RBU	–	281
Lower Saxony part of the Weser RBU	–	987
Lower Saxony part of the Ems RBU	–	293
Lower Saxony part of the Rhine RBU	–	44

Table 90: Overview of the chemical status of surface water bodies, excluding the results for mercury in biota, broken down by the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins

	Chemical status – measured – all surface waters	
	Good	Not good
Lower Saxony	**58**	**67**
Lower Saxony part of the Elbe RBU	10	8
Lower Saxony part of the Weser RBU	39	37
Lower Saxony part of the Ems RBU	7	20
Lower Saxony part of the Rhine RBU	2	2
	Chemical status – interpolated – all surface waters	
	Good	**Not good**
Lower Saxony	**312**	**99**
Lower Saxony part of the Elbe RBU	54	4
Lower Saxony part of the Weser RBU	213	75
Lower Saxony part of the Ems RBU	36	19
Lower Saxony part of the Rhine RBU	9	1
	Chemical status – no assessment possible – all surface waters	
Lower Saxony	**1,069**	
Lower Saxony part of the Elbe RBU	205	
Lower Saxony part of the Weser RBU	623	
Lower Saxony part of the Ems RBU	211	
Lower Saxony part of the Rhine RBU	30	

Table 91: Overview of the chemical status of surface water bodies, excluding ubiquitous substances, broken down by the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins

	Chemical status (without ubiquitous substances) – measured – all surface waters	
	Good	**Not good**
Lower Saxony	**95**	**30**
Lower Saxony part of the Elbe RBU	16	2
Lower Saxony part of the Weser RBU	53	23
Lower Saxony part of the Ems RBU	22	5
Lower Saxony part of the Rhine RBU	4	-
	Chemical status (without ubiquitous substances) – interpolated – all surface waters	
	Good	**Not good**
Lower Saxony	**343**	**68**
Lower Saxony part of the Elbe RBU	56	2
Lower Saxony part of the Weser RBU	225	63
Lower Saxony part of the Ems RBU	52	3
Lower Saxony part of the Rhine RBU	10	-
	Chemical status (excluding ubiquitous substances) – no assessment possible – all surface waters	
Lower Saxony	**874**	
Lower Saxony part of the Elbe RBU	166	
Lower Saxony part of the Weser RBU	536	
Lower Saxony part of the Ems RBU	150	
Lower Saxony part of the Rhine RBU	22	

Appendix A-4: Assessment findings – Surface waters

The following Table 96 shows the status, pressures and assessment findings for every surface water body situated wholly or partially in Lower Saxony. Since the space available is not sufficient to describe the individual attributes, the following tables show the abbreviations used.

Table 92: Abbreviations: Ecological and chemical status and ecological potential of surface water bodies

Ecological status	Coding	Ecological potential	Coding	Chemical status	Coding
High	1			Good	1 (0.5 EQS)
Good	2	Good	2		2 (EQS satisfied)
Moderate	3	Moderate	3	Not good	3 (EQS not satisfied)
Poor	4	Poor	4		4 (2 times EQS)
Bad	5	Bad	5		

Table 93: Abbreviations: Reasons for classification as heavily modified water body (HMWB)

Abbreviation	Significant negative impact
e20	Land drainage and flood control
e21	Cultivation weirs
e22	Urbanisation
e23	Flood control
e24	Shipping
e26	Hydro power
e27	Water supply/drinking water storage
e28	Leisure and recreation
e29	Environment (in the broader sense)
e30	Dams, reservoirs

Table 94: Abbreviations: Significant pressures

Abbreviation	Pressures due to
p1	Point sources
p2	Diffuse sources
p3	Water abstraction
p4	Discharge regulation and morphological changes
p7	Other pressures on surface waters
p8	due to municipal sewage plants
p9	due to rainwater relief
p11	due to industrial use affected by the IPPC Directive
p13	Other point sources (specify)
p21	due to agricultural activities (through seepage, erosion, discharge, drainage, changes in farming methods, afforestation)
p22	due to transport and infrastructures not connected to sewage systems (ships, railways, motor vehicles, aircraft and the relevant infrastructures outside urban areas)
p26	Other diffuse sources (specify)
p27	due to agricultural activities, e.g. use of fertilisers and crop protection agents, livestock density etc.)
p40	Other significant abstractions
p49	Discharge regulation
p55	Weirs
p57	Water body development
p58	Changes in/loss of bank and water meadow areas
p63	Dredging/ wet excavation
p72	Impounding structures
p84	Fisheries, amateur fishing
p89	Other pressures (specify)

In view of the length of the entries, the head of Table 96 uses abbreviations that are listed in the following Table 95.

Table 95: Abbreviations for column headings in Table 96

Column heading Table 96	Abbreviation
River basin unit	RBU
Water body number The water body number consists of the code for Germany (DE), the water body category (RW = river water, LW = lake, TW = transitional water, CW = coastal water), the federal state responsible for the water body, and a combination of numbers and letters	EU Code/WB No.
Water body name	WB name
Artificial water body 08 (AWB)	AWB 08
Artificial water body 13 (AWB)	AWB 13
Heavily modified water body 08 (HMWB)	HMWB 08
Heavily modified water body 13 (HMWB)	HMWB 13
Reasons for designation as HMWB (see Table 93)	Reason
Pressures (see Table 94)	Contamination
Ecological status 2008 (see Table 92)	ES 08
Ecological status 2014 (see Table 92)	ES 14
Ecological potential 2008 (see Table 94)	EP 08
Ecological potential 2014 (see Table 92)	EP 14
Chemical status 2014 with mercury component	CS 14 with Hg
Chemical status 2014 without mercury component	CS 14 without Hg
Chemical status 2014 without ubiquitous substances	CS 14 without ubi. Substances
In the columns HMWB and AWB, N stands for No and Y for Yes	
U stands for “unclassified”	

Table 96 shows the water body status, the pressures and the assessment findings for each water body. The list includes not only water bodies for which Lower Saxony is responsible, but also water bodies which are located in Lower Saxony but fall within the sphere of responsibility of neighbouring federal states.
As well as the updated water body status, the table also shows the water body status for 2008. This makes it possible to follow the changes revealed by the updated inventory. The methods are described in Chapter 4.2. The table shows the present ecological assessment findings. The result from the year 2008 is also shown wherever a comparison between the results for 2008 and 2014 is methodologically possible. In view of methodological changes in the ecological assessment of surface waters, a comparison is not possible for all water bodies (cf. Chapter 13.4).
In the case of chemical assessment, the table shows the results of considering three different groups of substances. The system for this is explained in Chapter 4.2.3.

Table 96: Status, pressures and assessment findings for surface water bodies in Lower Saxony

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Elbe river basin															
Flowing waters															
Elbe	DE_RW_DENI_30055	Achthöfener Fleth	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	2
Elbe	DE_RW_DENI_31019	Ahlenrönne	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_30065	Ahrensbach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30066	Ahrensbach Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DEST_MEL05OW01-00	Aland (OL=Milde; ML=Biese) – von Uchte bis Mündung (NI)	N	N	Y	Y	e20	p2,p4	–	–	–	4	3	–	2
Elbe	DE_RW_DENI_30011	Alpershausener Mühlenbach mit Sotheler Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DEST_MEL06OW23-00	Alte Dumme	N	N	N	N	–	p2,p4	4	4	–	–	3	–	2
Elbe	DE_RW_DENI_27012	Alte Jeetzel	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_31039	Altenbrucher Kanal	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_31012	Ankeloher Randkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Elbe	DE_RW_DENI_28082	Appelbeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28067	Ashauser Mühlenbach (Unterlauf) u. Deichgraben	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_28069	Ashauser Mühlenbach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28018	Aubach, Pferdebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Elbe	DE_RW_DENI_30061	Aue (Oste)	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30010	Aue (Ramme)	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28049	Aue (Stederau) Oberlauf	N	N	Y	N	–	p21,p26,p57	–	5	4	–	4	U	U
Elbe	DE_RW_DENI_28046	Aue (Stederau) Unterlauf	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	2	2
Elbe	DE_RW_DENI_30005	Aue-Tostedt-Heidenau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_30017	Bade	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_30022	Barcheler Bach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28092	Barnstedt-Melbecker Bach	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Elbe	DE_RW_DENI_30052	Basbecker Schleusenfleth mit Hackemühlener Bach Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_30076	Bever (bis auf Abschnitt oh. Mündung)	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_30024	Bever Abschnitt oh. Mündung	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_28034	Bienenbütteler Mühlenbach, Natendorfer Bach, Varendorfer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Elbe	DE_RW_DENI_30041	Blumenthaler Schleusenfleth	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_28042	Borger Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28096	Bornbach, Wrestedter Bach	–	N	–	N	–	p26,p57	–	3	–	–	4	U	U
Elbe	DE_RW_DENI_29002	Borsteler Binnenelbe	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DEMV_SBOI-0100	Brahlstorfer Bach	–	N	–	Y	e20	p21,p26,p57,p7,p72,p88	–	–	–	4	3	–	2
Elbe	DE_RW_DENI_36013	Bremsenbach	N	N	N	Y	e20	p21,p26,p57	4	–	–	4	4	U	U
Elbe	DE_RW_DENI_27013	Breselenzer Bach, Breustianer Mühlenb., Grabower Mühlenb.	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30057	Brucher Schleusenfleth	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28041	Bruchwedeler Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U

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Elbe	DE_RW_DENI_28002	Brummelbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28023	Brunau (Oberlauf)	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_28025	Brunau (Unterlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28024	Brunau-See	N	N	Y	Y	e28,e30	p21,p26,p57	–	–	–	U	4	U	U
Elbe	DE_RW_DENI_30045	Burgbeckkanal Oberlauf	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Elbe	DE_RW_DENI_30046	Burgbeckkanal Unterlauf	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_30072	Buschhorstbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_29053	Bützflether Süderelbe	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_27005	Clenzer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_36012	Dammbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_27014	Dannenberger Landgraben, Gedelitzer Kanal	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_29045	Deinster Mühlenbach mit Westerbeck (= Oberlauf)	N	N	Y	N	–	p21,p26,p57	–	3	4	–	4	U	U
Elbe	DE_RW_DENI_28031	Dieksbach	N	N	Y	N	–	p26,p57	–	4	3	–	4	U	2
Elbe	DE_RW_DENI_27019	Drawehner Jeetzel	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30047	Düdenbütteler Bach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30048	Düdenbütteler Bach Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30025	Duxbach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30026	Duxbach Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28097	Eisenbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28032	Eitzener Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Elbe	DE_RW_DENI_MEL08OW01-00	Elbe (Geesthacht bis Rühstädt)	–	N	–	N	–	p21,p22,p26,p57	–	4	–	–	4	4	4
Elbe	DE_RW_DEHH_el_01	Elbe (Ost)	N	N	Y	Y	e23,e24	p26,p53,p57,p58,p63	–	–	–	3	4	–	4
Elbe	DE_RW_DENI_28063	Elbe-Seitenkanal (Elbe bis Schiffshebewerk Scharnebeck)	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Elbe	DE_RW_DENI_28064	Elbe-Seitenkanal (Schiffshebewerk Scharnebeck bis Schleuse Uelzen)	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Elbe	DE_RW_DENI_28065	Elbe-Seitenkanal (Schleuse Uelzen bis Einmündung in den Mittellandkanal)	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U

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Elbe	DE_RW_DENI_31033	Emmelke Mittel- und Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_31032	Emmelke Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_29026	Este (Buxtehude-Cranz)	N	N	Y	Y	e24,e23,e22	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28087	Este (Moisburg-Buxtehude)	N	N	N	N	–	p21,p26,p57	2	3	–	–	4	2	2
Elbe	DE_RW_DENI_28086	Este (Seggerheide - Moisburg)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Elbe	DE_RW_DENI_28088	Este (Stadtgebiet Buxtehude)	N	N	Y	Y	e22	p26,p57	–	–	–	3	4	2	2
Elbe	DE_RW_DENI_28077	Este (Welle - Seggerheide)	N	N	Y	N	–	p21,p26,p57	–	3	4		4	2	2
Elbe	DE_RW_DENI_28076	Este Oberlauf	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	2	2
Elbe	DE_RW_DENI_28044	Esterau (Oberlauf), Soltendiecker Graben, Wellendorfer	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28045	Esterau (Unterlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30021	Fahrendorfer Kanal	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_30075	Fallohbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_36007	Feldgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_31021	Fickmühlener Randkanal (Oberlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_31022	Fickmühlener Randkanal (Unterlauf) mit Hymendorfer Abzug	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_31015	Flögelner Seeabfluss	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DEST_MEL06OW19-00	Flöt- und Mühlengraben	N	N	Y	Y	e20	p1,p2,p4	–	–	–	5	3	–	2
Elbe	DE_RW_DENI_28001	Forst Graben	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Elbe	DE_RW_DENI_29044	Fredenbecker Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_29057	Freiburger Schleusenfleth Oberlauf (tidefrei)	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_29058	Freiburger Schleusenfleth Unterlauf (tidebeeinflusst)	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28058	Gerdau (Mittellauf)	N	N	N	N	–	p21,p26,p57	2	3	–	–	4	2	2
Elbe	DE_RW_DENI_28056	Gerdau (Oberlauf)	N	N	N	N	–	p26,p57	3	3	–	–	4	2	2
Elbe	DE_RW_DENI_28047	Gerdau Unterlauf	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	2	2
Elbe	DE_RW_DENI_30060	Geversdorfer Schleusenfleth	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_28089	Goldbeck	N	N	Y	N		p21,p26,p57	–	3	4	–	4	2	2

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Elbe	DE_RW_DENI_31026	Gösche	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_31041	Gr. Medemstader Wettern	–	Y	–	N	–	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_31030	Gr. Siedenteiler Wettern	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_51003	Graben 100	Y	Y	N	N	–	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_30033	Gräpeler Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_29043	Grenzgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_30051	Große Rönne	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	U	2
Elbe	DE_RW_DENI_30049	Großenwördener Seekanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DEST_SAL18OW01-00	Großer Graben	Y	Y	N	N	–	p1,p2,p4,p7	–	–	–	5	3	–	2
Elbe	DE_RW_DENI_29037	Guderhandvierteler Schöpfwerkskanal	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_30054	Hackemühlener Bach Mittellauf mit Heeßeler Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30053	Hackemühlener Bach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_31010	Hadelner Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_27018	HAG Prezelle-Gartow, Bürgermoorgraben	Y	Y	N	N	–	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_31017	Halemer Seeabfluss	N	N	N	N	–	p21,p26,p57	4	5	–	–	4	U	U
Elbe	DE_RW_DENI_28054	Hardau (Mittellauf), Räber Spring, Stahlbach	N	N	Y	N	–	p21,p26,p57	–	4	3	–	4	2	2
Elbe	DE_RW_DENI_28052	Hardau (Oberlauf)	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28051	Hardau (Unterlauf)	N	N	Y	N	–	p21,p26,p57	–	4	3	–	4	2	2
Elbe	DE_RW_DENI_28053	Hardau-See	N	N	Y	Y	e28,e30	p21,p26,p57	–	–	–	U	4	U	U
Elbe	DE_RW_DENI_27024	Harlinger Bach, Metzinger Bach	N	N	Y	N	–	p26,p57	–	4	4	–	4	U	1
Elbe	DE_RW_DENI_29050	Harschenflether Wettern	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28095	Häsebach	–	N	–	Y	e20	p26,p57	–	–	–	3	4	2	2
Elbe	DE_RW_DENI_28029	Hasenburger Mühlenbach, Südergellerser Bach, Osterbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Elbe	DE_RW_DENI_31025	Hauptvorfluter Steinau	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_29049	Heidbeck	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30056	Herrenfleth	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	2

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Elbe	DE_RW_DENI_28035	Höhnkenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Elbe	DE_RW_DENI_30039	Hollener Mühlenbach	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_29001	Hörne-Götzdorfer Kanal	Y	Y	N	N	–	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_30043	Horsterbeck Mittellauf	N	N	Y	Y	e23,e20	p8,p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_30042	Horsterbeck Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Elbe	DE_RW_DENI_30044	Horsterbeck Unterlauf	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_38003	Ichte	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	U	U
Elbe	DE_RW_DENI_30050	Ihlbecker Kanal	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_28013	Ilmenau (Lüneburg - Oldershausen)	N	N	Y	Y	e24,e20,e22	p22,p26,p57	–	–	–	3	4	4	2
Elbe	DE_RW_DENI_28012	Ilmenau (Oldershausen - Mündung)	Y	Y	N	N	–	p22,p26,p57	–	–	–	4	4	3	2
Elbe	DE_RW_DENI_28061	Ilmenau (Uelzen - Lüneburg)	N	N	Y	N	–	p21,p22,p26,p57	–	3	3	–	4	4	2
Elbe	DE_RW_DEST_MEL06OW01-00	Jeetze – von Purnitz bis oh. Lüchow (NI)	N	N	Y	N	–	p2,p3,p4	–	4	3	–	3	–	2
Elbe	DE_RW_DENI_27031	Jeetzel (Lüchow - Lüggau)	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_27022	Jeetzel (Lüggau - Mündung)	N	N	Y	Y	e23,e20	p21,p22,p26,p57	–	–	–	3	4	3	1
Elbe	DE_RW_DENI_36015	Jerxheim-Söllinger Randgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30006	Kalber Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_51002	Karoxbosteler Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_27026	Kateminer Mühlenbach, Pommoisseler Gr., Ventschauer	N	N	Y	N	–	p26,p57	–	3	4	–	4	U	U
Elbe	DE_RW_DENI_29061	Kattenbeck	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28040	Klein Liederner Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_39008	Knickgraben, Haar-Kührener Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1
Elbe	DE_RW_DENI_30013	Knüllbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_27006	Köhlener Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28094	Kolkbach	–	N	–	Y	e20	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28093	Kolkhagener Bach	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_27011	Köngshorster Kanal, Tarmitzer Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U

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Elbe	DE_RW_DENI_39007	Krainke, Kaarßen-Prilipper Graben	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	1
Elbe	DE_RW_DENI_30059	Krummendeicher Wettern	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_30012	Kuhbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_27015	Kupernitzkanal, Rantzaukanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30058	Laaker Fleth	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_39004	Laaver Kanal	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_36014	Lahbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30040	Lamstedter Kanal mit Sether Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_28014	Landwehrgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_31037	Landwehrkanal	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_29029	Landwettern	N	N	Y	Y	e20,e22	p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DEMV_SUDE-2100	Langenheider Bauerngraben	–	N	–	Y	e20	p21,p26,p57,p72,p88	–	–	–	3	3	–	2
Elbe	DE_RW_DEMV_EMEL-0700	Löcknitz	–	Y	–	N	–	p21,p26,p57,p72,p88	–	–	–	3	3	–	2
Elbe	DE_RW_DENI_28026	Lopau (Ober- u. Mittellauf), Ehlbeck	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28028	Lopau (Unterlauf)	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28027	Lopau-See	N	N	Y	Y	e28,e30	p26,p57	–	–	–	U	4	U	U
Elbe	DE_RW_DENI_27020	Lübelner Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_27008	Lüchower Landgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_27016	Luciekanal, HAG Prezelle-Lomitz, Panie-Buhn-Graben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28017	Luhe (Mittellauf Luhmühlen - Winsen)	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	2	2
Elbe	DE_RW_DENI_28020	Luhe (Mittellauf Schwindebeck - Luhmühlen)	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	2	2
Elbe	DE_RW_DENI_28091	Luhe (Oberlauf)	–	N	–	Y	e20	p26,p57	–	–	–	4	4	2	2
Elbe	DE_RW_DENI_28016	Luhe (Unterlauf)	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	2	2
Elbe	DE_RW_DENI_29031	Lühe-Aue Mittellauf 1	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	1	1
Elbe	DE_RW_DENI_29032	Lühe-Aue Mittellauf 2	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	1	1
Elbe	DE_RW_DENI_29030	Lühe-Aue Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1

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Elbe	DE_RW_DENI_29033	Lühe-Aue Unterlauf	N	N	Y	Y	e24,e23,e20,e22	p22,p26,p57	–	–	–	4	4	4	2
Elbe	DE_RW_DENI_28009	Marschwetter, Ilau-Schneegr., Bruchwetter, Neetze (Unterl.)	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	2
Elbe	DE_RW_DENI_28007	Mausetalbach, St. Vitusbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_31029	Medem	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_27028	Meetschower Hauptgraben	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30071	Mehde-Aue	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_30034	Mehe (Oberlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_30035	Mehe Mittellauf	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_30036	Mehe Unterlauf	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_36011	Missaue	Y	N	N	Y	e20	p13,p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_28083	Moisburger Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Elbe	DE_RW_DENI_31038	Mooraue	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28085	Moorbach	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DEHH_mo_01	Moorburger Landscheide, Moorwettern, Hohenwischer Schleusenfleet, Alte Suederelbe (Abschnitt Fliess	Y	Y	N	N	–	p26,p9,p26,p32,p72,p88	–	–	–	3	4	–	4
Elbe	DE_RW_DENI_31042	Moorwettern	–	Y	–	N	–	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_31023	Mühe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_29035	Mühlenbach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_29036	Mühlenbach Unterlauf	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_28006	Neetze (Ellringen - Neetze)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28003	Neetze (Neetze - Echem)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28008	Neetze (Oberlauf), Süschenb., Strachau, Kalberlah, Harmstorfer B.	N	N	Y	Y	e20	p8,p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_28004	Neetze-Kanal	Y	Y	N	N	–	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_31020	Neuenwalder-Ahlener-Randkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30062	Neuhaus-Bülkauer-Kanal	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28019	Nordbach, Oelstorfer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U

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Elbe	DE_RW_DENI_27004	Nördlicher Mühlenbach (Schnegaer Mühlengraben)	N	N	Y	N	–	p21,p26,p57	–	3	4	–	4	U	U
Elbe	DE_RW_DENI_29060	Nördlicher Sielgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_30069	Nördlicher Sielgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_27030	Nördlicher u. Südlicher Schaugraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Elbe	DE_RW_DENI_30027	Oereler Kanal Oberlauf	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_30028	Oereler Kanal Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DEST_MEL03OW03-00	Ohre – Verteilerwehr bis Wehr Calvörde	Y	Y	N	N	–	p1,p2,p4	–	–	–	5	3	–	2
Elbe	DE_RW_DEST_MEL03OW04-00	Ohre – von Quelle bis Verteilerwehr	N	N	Y	N	–	p2,p4	–	5	–	–	3	–	2
Elbe	DE_RW_DENI_30073	Osenhorster Bach	–	N	–	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_36005	Ostbach (Soltau)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_30003	Oste (Bremervörde-Oberndorf)	N	N	Y	Y	e24,e23,e20	p8,p21,p22,p26,p57	–	–	–	4	4	4	2
Elbe	DE_RW_DENI_30004	Oste (Oberndorf bis Mündung)	N	N	Y	Y	e24,e23,e20	p21,p22,p26,p57	–	–	–	4	4	4	2
Elbe	DE_RW_DENI_30001	Oste (Quelle -Einmündung Ramme)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_30002	Oste (Ramme-Bremervörde)	N	N	N	N	–	p8,p21,p26,p57	3	4	–	–	4	1	1
Elbe	DE_RW_DENI_30020	Oste-Hamme-Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_29051	Osterbeck Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_29052	Osterbeck Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30029	Oste-Schwinge-Kanal (Oberlauf)	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_30030	Oste-Schwinge-Kanal (Unterlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Elbe	DE_RW_DENI_30077	Otter	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28062	Pattenser Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28080	Perlbach	N	N	Y	N	–	p21,p26,p57	–	4	4	–	4	U	U
Elbe	DE_RW_DENI_27021	Prisserscher Bach	N	N	Y	N	–	p26,p57	–	4	3	–	4	U	U
Elbe	DE_RW_DENI_30070	Pulvermühlenbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28075	Radenbach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28015	Raderbach	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U

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Elbe	DE_RW_DENI_30007	Ramme (Ober- und Mittellauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_30008	Ramme (Unterlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_30064	Remperbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28057	Rheinmetallsee	N	N	Y	Y	e30,e29	p26,p57	–	–	–	U	4	U	U
Elbe	DE_RW_DENI_28038	Röbbelbach (Ober- u. Mittellauf), Gollernbach	N	N	Y	Y	e20	p8,p21,p26,p57	–	–	–	5	4	U	2
Elbe	DE_RW_DENI_28037	Röbbelbach (Unterlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_28011	Roddau, Hausbach, Düsternhoopenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DEMV_ROEG-0300	Rögnitz	–	N	–	N	–	p21,p26,p49,p57,p58,p7,p72,p88	–	4	–	–	3	–	2
Elbe	DE_RW_DENI_28081	Rollbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_39005	Rosiener Schöpfwerksgraben	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_29054	Ruthenstrom	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28005	Sauerbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28010	Schleusengraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_28074	Schmale Aue Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28073	Schmale Aue Unterlauf	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	U	U
Elbe	DE_RW_DEST_SAL18OW15-00	Schöninger Aue – von Missaue bis Mündung	N	N	Y	N		p2,p4,p7	–	4	–	–	3	2	U
Elbe	DE_RW_DEST_SAL18OW14-00	Schöninger Aue – von Mühlenbach aus Völpke (Mittellauf=Kupferbach) bis Missaue	N	N	Y	Y	e20	p2,p4	–	–	–	4	3	–	2
Elbe	DE_RW_DEST_SAL18OW13-00	Schöninger Aue – von Quelle (QL=Wirbke) bis Mühlenbach aus Völpke	N	N	Y	Y	e20	p1,p2,p3,p4	–	–	–	4	3	–	3
Elbe	DE_RW_DENI_29039	Schöpfwerkskanal Hollern-Steinkirchener Moor / Agathenburger Moorwettern	Y	Y	N	N	–	p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28066	Schöpfwerkszubringer Hoopte	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28060	Schwienau (Oberl.),Wriedeler B., Oechtringer B.,Schliepbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Elbe	DE_RW_DENI_28059	Schwienau (Unterlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Elbe	DE_RW_DENI_28021	Schwindebach, Ham-Bach	N	N	N	N	–	p26,p57	3	3	–	–	4	U	U
Elbe	DE_RW_DENI_29041	Schwinge Mittellauf	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	4	3

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Elbe	DE_RW_DENI_29040	Schwinge Oberlauf	N	N	Y	N	–	p21,p22,p26,p57	–	3	3	–	4	4	3
Elbe	DE_RW_DENI_29042	Schwinge Unterlauf	N	N	Y	Y	e24,e23,e20,e22	p22,p26,p57	–	–	–	4	4	4	3
Elbe	DE_RW_DEST_MEL06OW26-00	Seege – von Seegraben bis Gartower See (NI)	N	N	Y	Y	e21	p2,p4	–	–	–	4	3	–	2
Elbe	DE_RW_DENI_27027	Seege (Gartow - Mündung)	N	N	Y	N	–	p26,p57	–	4	–	–	4	2	2
Elbe	DE_RW_DENI_28048	Seehalsbeeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Elbe	DE_RW_DENI_28070	Seeve Mittellauf	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	1	1
Elbe	DE_RW_DENI_28072	Seeve Oberlauf mit Nebengewässern	N	N	Y	N	–	p26,p57	–	3	3	–	4	1	1
Elbe	DE_RW_DENI_28068	Seeve Unterlauf	N	N	Y	Y	e23,e20	p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DEHH_se_01	Seevekanal	Y	Y	N	N	–	p26,p9,p40,p55,p57,p62,p83,p49	–	–	–	3	4	–	4
Elbe	DE_RW_DENI_30018	Selsinger Bach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_30019	Selsinger Bach Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_28071	Seppenser u. Reindorfer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_36004	Soltau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_38008	Sprakelbach	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Elbe	DE_RW_DENI_28078	Sprötzer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_28084	Staersbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Elbe	DE_RW_DENI_38001	Steinaer Bach	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Elbe	DE_RW_DENI_38002	Steinaer Bach	N	N	N	N	–	p21,p26	4	U	–	–	4	U	U
Elbe	DE_RW_DENI_29034	Steinbeck (Lühe-Aue)	N	N	Y	N	–	p21,p26,p57	–	4	3	–	4	1	1
Elbe	DE_RW_DENI_29046	Steinbeck (Schwinge)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_30067	Stinstedter Abfluss	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_31027	Stinstedter Randkanal Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_31028	Stinstedter Randkanal Unterlauf	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_31040	Straßdeichwettern	–	Y	–	N	–	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DEMV_SUDE-1950	Sude	–	N	–	N	–	p21,p26,p57,p58,p7,p72	–	3	–	–	3	–	2
Elbe	DE_RW_DEMV_SBOI-0500	Sude, Unterlauf	–	N	–	N	–	p21,p26,p57,p58,p7,p72,p88	–	3	–	–	3	–	2

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Elbe	DE_RW_DENI_29059	Südlicher Sielgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_30068	Südlicher Sielgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_27017	Südöstlicher Randgraben, Trebeler Hauptgr., Feinhöfengr.	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_39009	Sumter Kanal, Gülstorfer Graben, Forstgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Elbe	DE_RW_DENI_27023	Taube Elbe-Gümser Schleusengr.-HAG, Dannenberger Marsch	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28098	Tostedter Mühlenbach	–	N	–	N	–	p21,p26,p57	–	3	–	–	4	U	U
Elbe	DE_RW_DENI_28099	Tostedter Mühlenbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_36003	Triftgraben	Y	Y	N	N		p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30074	Twiste Oberlauf	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_30016	Twiste Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_38004	Uffe	N	N	N	N	–	p26,p57	1	3	–	–	4	U	U
Elbe	DE_RW_DENI_38005	Uffe	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Elbe	DE_RW_DENI_30009	Viehgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Elbe	DE_RW_DENI_28033	Vierenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Elbe	DE_RW_DENI_30038	Wallbeck	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DEST_SAL17OW07-00	Warme Bode	N	N	N	N	–	–	–	3	–	–	3	–	2
Elbe	DE_RW_DENI_36006	Westerbach/Wiesengraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_30037	Westerbeck	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_38006	Wieda	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Elbe	DE_RW_DENI_38007	Wieda	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Elbe	DE_RW_DENI_31034	Wilster	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	1	1
Elbe	DE_RW_DENI_36002	Winnigstedter Tiefenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Elbe	DE_RW_DENI_28039	Wipperau (Mittel- u. Unterlauf)	N	N	Y	Y	e20	p8,p21,p26,p57	–	–	–	4	4	U	2
Elbe	DE_RW_DENI_28043	Wipperau (Oberlauf), Dalldorfer Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Elbe	DE_RW_DENI_29056	Wischhafener Schleusenfleth	Y	Y	N	N	–	–	–	–	–	5	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Elbe	DE_RW_DENI_29055	Wischhafener Süderelbe	N	N	Y	N	–	p8,p26,p57	–	4	4	–	4	U	U
Elbe	DE_RW_DENI_28090	Wittenbach	–	N	–	N	–	p26,p57	–	3	–	–	4	U	U
Elbe	DE_RW_DENI_28036	Wohbeck	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Elbe	DE_RW_DENI_27001	Wustrower Dumme (Oberlauf)	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Elbe	DE_RW_DENI_27002	Wustrower Dumme (Unterlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Elbe	DE_RW_DENI_38009	Zorge	N	N	N	N	–	p26,p57	3	3	–	–	4	U	U
Standing waters															
	DE_LW_DENI_30063	Balksee	N	N	N	N	–	p21,p26	3	5	–	–	4	U	U
	DE_LW_DENI_31011	Bederkesaer See	N	N	N	N	–	p21,p26	3	5	–	–	4	U	U
	DE_LW_DENI_31016	Flögelner See	N	N	N	N	–	p21,p26	4	4	–	–	4	1	1
	DE_LW_DENI_27009	Gartower See	N	N	Y	Y	e28,e23	p21,p26,p58	–	–	4	3	4	U	U
	DE_LW_DENI_31018	Halemer-/Dahlemer See	N	N	N	N	–	p21,p26	3	4	–	–	4	1	1
Transitional waters															
	DE_TW_DESH_T1.5000.01	Übergangsgewässer der Elbe	N	N	Y	Y	e23,e24	p21,p22,p26,p57,p58,p65	–	–	3	3	4	–	4
Coastal waters															
	DE_CW_N3.5000.04.01	Außenelbe Nord	N	N	N	N	–	p21,p26	4	5	–	–	3	–	U
	DE_CW_N4.5000.04.02	Hakensand	N	N	N	N	–	p21,p26	4	5	–	–	3	–	U
	DE_CW_N4_5900_01	Westliches Wattenmeer der Elbe	N	N	N	N	–	p21,p26	4	5	–	–	4	1	1
Weser river basin															
Flowing waters															
Weser	DE_RW_DENI_26024	Abbehauser Sieltief / Utergadinger Tief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_15003	Abzucht	N	N	Y	Y	e22	p13,p26,p57	–	–	–	3	4	4	4

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Weser	DE_RW_DENI_16016	Adamsgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24076	Ahauser Bach	–	N	–	N	–	p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_24032	Ahauser Bach und Ahauser Mühlengraben	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	U	U
Weser	DE_RW_DENI_26120	Ahe	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_08021	Ahle	N	N	N	N	–	p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_17066	Ahnsbecker Kanal	–	Y	–	N	–	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_17016	Ahrbeck	N	N	N	N	–	p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_21081	Akebeeke	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_25071	Aldorfer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_26065	Alfgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_14014	Aller	N	N	Y	Y	e20	p13,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_14044	Aller	N	N	Y	Y	e20	p13,p22,p26,p57	–	–	–	3	4	4	2
Weser	DE_RW_DENI_22001	Aller	N	N	Y	Y	e24	p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_17001	Aller I	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	3	3
Weser	DE_RW_DENI_17002	Aller II	N	N	Y	Y	e24	p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_18023	Allerbach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_13030	Allerbeeke Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_13024	Allerbeeke Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_14046	Allerkanal	Y	Y	N	N	–	p13,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_20016	Alme	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_22019	Alpe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_22018	Alpe (Oberlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_20017	Alpebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	3	3
Weser	DE_RW_DENI_12003	Alte Aller	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_16019	Alte Aue	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_16046	Alte Fuhse (Knickgraben)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U

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Weser	DE_RW_DENI_21085	Alte Leine	–	N	–	N	–	p21,p26,p57	–	5	–	–	4	U	U
Weser	DE_RW_DENI_22005	Alte Leine	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_21010	Alte Leine/Hallerbruchgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26055	Alte Lune	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_12048	Alte Weser	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_26058	Alte Weser	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_15026	Altenau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_15028	Altenau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENI_25048	Altonaer Mühlbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENI_26119	Altwistedter Lune	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_17069	Alvernscher Bach	–	N	–	N	–	p21,p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_17042	Angelbach	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENI_23005	Annengr.Unterl. / Heidkruger Bäke	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_23010	Annengraben Oberlauf	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_12002	Arberger Kanal, Lienertgraben, Brede-Ehrs Graben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_21046	Arnumer Landwehr	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_17019	Aschau	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_26089	Aschwardener Flutgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Weser	DE_RW_DENI_26108	Aschwardener Flutgraben Unterlauf	N	N	Y	Y	e23	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_17035	Aue	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_19037	Aue	N	N	N	N	–	p21,p26,p57	4	5	–	–	4	U	U
Weser	DE_RW_DENI_21057	Aue	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_18006	Aue (z. Gande)	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DENI_18009	Aue (z. Leine)	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_18012	Aue (z. Leine)	N	N	N	N	–	p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_25055	Aue + Zuflüsse	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U

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Weser	DE_RW_DENI_16035	Aue/Erse	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_16053	Aue/Erse	N	N	Y	Y	e20	p13,p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_16041	Auebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_14029	Ausbütteler Riede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_21013	Auter Bach	N	N	N	N	–	p21,p26,p57	3	5	–	–	4	U	U
Weser	DE_RW_DENI_21012	Auter Fluss	N	N	N	N	–	p26	3	2	–	–	4	U	U
Weser	DE_RW_DENI_21014	Auter Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_13008	Bahrenborstel-Scharringhäuser Entlastungsgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_12043	Bannseegraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_19042	Barbiser Bach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_25085	Bardenflether Tief	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_12012	Bärenfallgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_25069	Bargeriede Oberlauf	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_25070	Bargeriede Unterlauf mit Drentweder Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_26033	Barkenbuschschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_24016	Bartelsdorfer Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENI_24044	Bassener Mühlengraben I	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_24045	Bassener Mühlengraben II	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_19022	Beber (Pöhlder Bach)	N	N	N	N	–	p26,p57	2	4	–	–	4	U	U
Weser	DE_RW_DENI_19048	Beber (Pöhlder Bach)	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_10013	Beberbach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_14012	Beberbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_15037	Beberbach	N	N	N	Y	e20	p21,p26,p57	3	–	–	4	4	2	2
Weser	DE_RW_DENI_26070	Bederkesa-Geeste-Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24013	Beek	N	N	Y	N	–	p21,p26,p57	–	4	3	–	4	2	1
Weser	DE_RW_DENI_24064	Beek	N	N	N	N	–	p26,p57	5	4	–	–	4	1	1

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Weser	DE_RW_DENI_16050	Beeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_22006	Beeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25066	Beeke	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_20021	Beffer/Lindenbach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_24011	Benkeloher Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_17051	Berger Bach	N	N	Y	Y	e20	p8,p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12004	Berkelsmoorgraben, Goldbach und Langwedeler Mühlenbach	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_16039	Berkumer Schölke/Glindbruchschölke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25039	Berne Mittellauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_20009	Beuster	N	N	Y	N	–	p21,p26,p57	–	4	4	–	4	4	4
Weser	DE_RW_DENI_08014	Beverbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_18032	Beverbach	N	N	Y	Y	e22	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_18033	Beverbach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_14018	Beverbach/Bokensdorferbach	N	N	Y	Y	e20	p26,p57	–	–	–	2	4	U	U
Weser	DE_RW_DENI_26048	Beverstedter Bach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18022	Bewer	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_15038	Bickgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_16028	Billerbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26121	Billerbeck Oberlauf	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26050	Billerbeck Unterlauf	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18051	Bischhauser Bach	N	N	N	N	–	p21,p26,p57	3	5	–	–	4	U	U
Weser	DE_RW_DENI_25035	Blankenburger Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_22033	Bleckwedeler Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_12007	Blender Emte	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12018	Blenhorster Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26022	Blexer Sieltief / Blexer Tief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_16025	Blöckengraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DEHB_26112	Blumenthaler Aue	N	N	Y	Y	e22	p9,p21,p26,p57,p58	–	–	–	5	3	–	U
Weser	DE_RW_DENI_26109	Blumenthaler Aue Mittellauf	N	N	N	N	–	p21,p26,p57	4	5	–	–	4	U	U
Weser	DE_RW_DENI_26094	Blumenthaler Aue Oberlauf	N	N	N	N	–	p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_22007	Böhme I	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	3	4	4	2
Weser	DE_RW_DENI_22008	Böhme II	N	N	Y	N	–	p22,p26,p57	–	4	3	–	4	4	2
Weser	DE_RW_DENI_22009	Böhme III	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	3	4	4	2
Weser	DE_RW_DENI_14017	Bokensdorfer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_18030	Bölle	N	N	N	N	–	p21,p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_22013	Bomlitz mit Riesbeck	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_21022	Bornau	N	N	N	N	–	p26,p57	2	3	–	–	4	2	2
Weser	DE_RW_DENI_25010	Bornbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_12055	Borngraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_14001	Bottendorfer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_26026	Braker Sieltief/ Dornebbe	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26074	Brameler Randgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_21042	Bredenbecker Bach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_19044	Brehme	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_15042	Breite Beeke (Salzd. Gr.)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_19021	Bremke	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_08009	Brevörder Bach (Glesse)	N	N	Y	N	–	p26	–	2	3	–	4	U	U
Weser	DE_RW_DENI_25096	Brockumer Pissing	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENW496262_4_8	Brockumer Pissing	Y	Y	N	N	–	p9, p13,p21,p26,p27,p55,p57,	–	–	–	4	3	–	2
Weser	DE_RW_DENI_25054	Brookbäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12024	Bruch- u. Kolkgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_17024	Bruchbach	N	N	Y	Y	e20	p26,p57	–	–	–	2	4	2	2

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_17059	Bruchgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_20002	Bruchgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	3	3
Weser	DE_RW_DENI_21048	Bruchriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24020	Bruchwiesenbach	N	N	Y	N	–	p26,p57	–	3	3	–	4	1	1
Weser	DE_RW_DENI_15032	Brückenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	4	4
Weser	DE_RW_DENI_17038	Brunau/ Ö. I	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	1
Weser	DE_RW_DENI_17039	Brunau/ Ö. II	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENI_14021	Bruneitzgraben	N	N	Y	N	–	p26,p57	–	5	4	–	4	U	U
Weser	DE_RW_DENI_26015	Brunner Bäke Mittellauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26016	Brunner Bäke Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_10027	Brünnighäuser Mühlbach	–	N	–	N	–	p21,p26,p57	–	4	–	–	4	U	U
Weser	DE_RW_DENI_14010	Bruno/Hässelbach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_15057	Brunsolgraben (Rote Riede)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12037	Bückeburger Aue (Mittellauf)	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_12058	Bückeburger Aue (oberer Mittellauf)	–	N	–	N	–	p21,p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_12040	Bückeburger Aue (oberer Oberlauf)	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_12057	Bückeburger Aue (unterer Mittellauf)	–	N	–	N	–	p21,p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_12049	Bückeburger Aue (Unterlauf in Nds.)	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DENI_12017	Bückener Mühlenbach (Oberlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_12015	Bückener Mühlenbach (Unterlauf)	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_21034	Bullerbach	N	N	Y	Y	e20,e22	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_14020	Bullergraben	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_25044	Bümmersteder Fleth	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_20013	Büntebach	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	4	4
Weser	DE_RW_DENI_21033	Büntegraben	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_16030	Burgdorfer Aue	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_16063	Burgdorfer Aue	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_26008	Butteler Bäke	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_12062	Calle	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26001	Crildumer- / Mühlentief	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_25014	Dadau Oberlauf	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	1
Weser	DE_RW_DENI_25078	Dadau Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_24027	Dahnhorstgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_08028	Daspe	N	N	Y	Y	e22	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_10005	Deckberger Bach	N	N	Y	N	–	p21,p26,p57	–	4	5	–	4	U	U
Weser	DE_RW_DENI_26059	Dedestorfer Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_24047	Deichschlot	N	N	Y	Y	e23,e20	p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_23003	Delme + Welse in Delmenhorst	N	N	Y	Y	e22	p22,p26,p57	–	–	–	4	4	4	3
Weser	DE_RW_DENI_23009	Delme Mittellauf	N	N	N	N	–	p21,p22,p26,p57	4	3	–	–	4	3	2
Weser	DE_RW_DENI_23025	Delme Oberlauf	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	2
Weser	DE_RW_DENI_23004	Delme Unterlauf oberhalb Delmenhorst	N	N	Y	Y	e23,e20	p21,p22,p26,p57	–	–	–	3	4	3	2
Weser	DE_RW_DENI_25052	Denghauser Bach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	2	1
Weser	DE_RW_DENI_21017	Desbrockriedegraben	N	N	Y	Y	e22	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_21061	Despe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_18020	Diesse	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	2	2
Weser	DE_RW_DENI_18021	Diesse	N	N	N	N	–	p26,p57	3	5	–	–	4	2	2
Weser	DE_RW_DENI_20006	Dingelber Klunkau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	3	3
Weser	DE_RW_DENI_25043	Dingsteder Bäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_20004	Dinklarer Klunkau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	3	3
Weser	DE_RW_DENI_20005	Dinklarer Klunkau	N	N	N	N	–	p26,p57	4	3	–	–	4	3	3
Weser	DE_RW_DENI_26123	Dohrener Bach		N		Y	e20	p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_26107	Doorgraben - Ost	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_19005	Dorster Mühlenbach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_26084	Dorumer Wasserlöse	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18054	Dramme	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_26039	Drepte Mittellauf	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26038	Drepte Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26040	Drepte Unterlauf	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25089	Drielaker Kanal / Tweelb. Randgr.	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_22041	Dröpper Fleet	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18011	Düderoder Bach	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_23028	Dummbäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_16054	Dummbruchgraben	N	N	Y	Y	e20	p13,p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18043	Dungbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_23011	Dünsener Bach Mittel- u. Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_23006	Dünsener Bach Unterl. / Pultern	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_24080	Dunzelbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_08030	Dürre Holzminde	–	N	–	N	–	p26	–	U	–	–	4	1	1
Weser	DE_RW_DENI_22004	Düshorner Bach	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_08013	Eberbach (Oberlauf Forstbach)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_18010	Eboldshauser Bach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_15011	Ecker	N	N	Y	N	–	p26,p57	–	3	4	–	4	4	4
Weser	DE_RW_DENI_15010	Ecker ab Talsperre	N	N	Y	N	–	p26,p57	–	3	3	–	4	U	U
Weser	DE_RW_DENI_15007	Ecker bis Talsperre	N	N	N	N	–	p26,p57	3	3	–	–	4	4	4
Weser	DE_RW_DENI_15009	Eckergraben	N	Y	Y	N	–	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_15015	Eckergraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENI_24046	Eckhoffgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_16021	Edder	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_08008	Eichelbach	N	N	N	N	–	p21,p26	5	U	–	–	4	U	U
Weser	DE_RW_DENI_21006	Eilveser Bach	N	N	N	N	–	p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_21030	Eimbeckhäuser Bach	N	N	Y	Y	e22	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12059	Eiter und Benkengraben	–	N	–	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_12005	Eiter Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_14048	Elbeseitenkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_25051	Ellenbäke	N	N	N	N	–	p21,p26,p57	2	3	–	–	4	U	1
Weser	DE_RW_DENI_26004	Ellenserdammer Tief + NG / Marsch	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_19030	Eller/Obere Eller	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	2	2
Weser	DE_RW_DENI_19038	Ellerbach	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DENI_11004	Else Mittellauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_11008	Else Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_25028	Elsflether Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_25007	Elze Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_26114	Emder Tief	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_10022	Emmer	N	N	Y	N	–	p22,p26,p57	–	3	3	–	4	4	3
Weser	DE_RW_DENI_14007	Emmerbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_14008	Emmerbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_21005	Empeder Bach	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_26003	Ems-Jade-Kanal bis Upschört	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26032	Ems-Jadekanal bis Wiesens	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_13025	Eschbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Weser	DE_RW_DENW45696_0_6	Eschenbach	N	N	N	N	–	p9,p13,p21p26,p27,p55,p57	2	3	–	–	3	–	2
Weser	DE_RW_DENI_18036	Espolde	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_18038	Espolde	N	N	N	N	–	p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_17045	Esseler Kanal mit Nordkanal	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_14053	Essenroderriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_18008	Eterna	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_24077	Everser Bach	–	N	–	N	–	p26,p57	–	4	–	–	4	U	U
Weser	DE_RW_DENI_10004	Exter	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_26021	Fedderwarder Sieltief / Eckwarder Sieltief Nord	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_24029	Federlohmühlenbachbach I	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_24030	Federlohmühlenbachbach II	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_23032	Finkenbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24072	Fintau	–	N	–	N	–	p21,p26,p57	–	3	–	–	4	2	1
Weser	DE_RW_DENI_25049	Flachsbäke	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	2	1
Weser	DE_RW_DENI_17003	Flettmarscher Abzugsgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24010	Florgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_16047	Flote	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_13015	Flöte	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_16052	Flöth	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_21077	Flöttenbach	N	N	N	N	–	p26	5	2	–	–	4	U	U
Weser	DE_RW_DENI_20007	Flussgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	3	3
Weser	DE_RW_DENI_16010	Flußgraben/Neuer Graben	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_08012	Forstbach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_21040	Fösse	N	N	Y	Y	e22	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25027	Freistätter Moorkanal	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26066	Frelsdorfer Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26030	Friedeburger Tief	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_21086	Fuchsbach mit Schille	–	N	–	N	–	p21,p26,p57	–	5	–	–	4	U	U
Weser	DE_RW_DENI_12019	Führser Mühlbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_12022	Führser Mühlbach (Oberlauf) und Nebengewässer	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_16031	Fuhse	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	5	4	4	4
Weser	DE_RW_DENI_16045	Fuhse	N	N	Y	Y	e20	p13,p21,p22,p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENI_16062	Fuhse	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENI_15034	Fuhsekanal	N	Y	Y	N	–	p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_16015	Fuhsekanal	Y	Y	N	N	–	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_16018	Fuhsekanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_14004	Fulau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DEHE_42.1	Fulda/Wahnhausen	N	N	Y	Y	e22,e24,e26,e28	p1,p2,p4,p8,p11,p26	–	–	–	5	3	–	2
Weser	DE_RW_DENI_22015	Fulde	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	U	U
Weser	DE_RW_DENI_12031	Fulde (Oberlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_12026	Fulde (Unterlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_26052	Gackau Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_26053	Gackau Unterlauf	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_18004	Gande	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_18005	Gande	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_18050	Garte (mit Thüringen)	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DEHB_26064	Geeste	N	N	Y	Y	e22	p26,p58	–	–	–	4	3	–	1
Weser	DE_RW_DENI_26061	Geeste Mittellauf (bis Einmündung Grove)	N	N	Y	Y	e23,e20	p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_26062	Geeste Mittellauf (uh. Grove bis Einmündung Seekanal)	N	N	Y	Y	e23,e20	p21,p22,p26,p57	–	–	–	4	4	3	1
Weser	DE_RW_DENI_26060	Geeste Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_26063	Geeste Unterlauf 1 (bis Tidesperrwerk)	N	N	Y	Y	e23,e20	p22,p26,p57	–	–	–	5	4	3	1
Weser	DE_RW_DENI_25040	Geestrandgraben West/ Berne	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26007	Geestrandtief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_12032	Gehle (Oberlauf in Nds.)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_21053	Gehlenbach	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_10026	Gelbbach	–	N	–	N	–	p21,p26,p57	–	4	–	–	4	U	U

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Weser	DE_RW_DENI_21049	Gestorfer Beeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_25087	Gew 4969386	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_24036	Giersdorf-Schanzendorfer Mühlengraben	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_19040	Gillersheimer Bach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	2	2
Weser	DE_RW_DENI_24023	Gilmerdinger Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_21065	Glasebach	N	N	Y	Y	e22	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_21062	Glene	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_15029	Glue Riede (Ahlumer Bach)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_15052	Glüsig (Lauinger Mühlenr.)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_22038	Gohbach mit Schmobach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_14054	Gosebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_26096	Gr. Fedderwarder Tief + NG	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_15025	Gr. Graben (Alte Ilse)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	4	4
Weser	DE_RW_DENI_25100	Graft (Bruchkanal) mit Hauptgraben Düversbruch	–	N	–	Y	e20,e21	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25005	Gräfte	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_20037	Grane	N	N	N	N	–	p26,p57	3	4	–	–	4	4	4
Weser	DE_RW_DENI_20043	Grane	N	N	Y	Y	e22	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_24026	Grapenmühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_14045	Graslebener Mühlengraben	N	N	Y	Y	e20	p13,p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_12061	Graue	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_26079	Grauwallkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_14031	Gravenhorster Riede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_25022	Grawiede	N	N	Y	Y	e20,e21	p21,p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_14049	Grenzgaben Rade	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_25008	Grenzkanal	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_10015	Grießebach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_21009	Grindau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_18044	Grone	N	N	Y	Y	e22	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_13001	Große Aue	N	N	Y	Y	e23,e20	p21,p22,p26,p57	–	–	–	4	4	3	1
Weser	DE_RW_DENI_22011	Große Aue inkl. Heidbach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	2
Weser	DE_RW_DENI_26078	Große Beek	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_21002	Große Beeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_19015	Große Kulmke	N	N	N	N	–	p26,p57	2	4	–	–	4	U	U
Weser	DE_RW_DENI_19017	Große Lonau	N	N	N	N	–	p26,p57	1	3	–	–	4	U	U
Weser	DE_RW_DENI_19020	Große Söse	N	N	N	N	–	p26	1	2	–	–	4	U	U
Weser	DE_RW_DENI_12045	Großenheidorngraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_26067	Grove	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18047	Grundbach	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	2	2
Weser	DE_RW_DENI_18049	Grundbach	N	N	N	N	–	p21,p26,p57	3	5	–	–	4	2	2
Weser	DE_RW_DENI_25033	Haaren Oberl. / Putthaaren	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25081	Haaren Stadtstrecke Oldenburg	N	N	Y	Y	e22	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25034	Haaren Unterl. + Unterl. Ofener Bäke	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_17021	Haberlandbach I	N	N	Y	Y	e20	p26,p57	–	–	–	2	4	1	1
Weser	DE_RW_DENI_17022	Haberlandbach II	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_23024	Hache Oberlauf	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	1
Weser	DE_RW_DENI_15030	Hachumer Bach	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_19010	Hackenbach	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_25057	Hageler Bach Mittellauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25058	Hageler Bach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_21004	Hagener Bach	N	N	N	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_19033	Hahle	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_19032	Hahle/Obere Hahle	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	2	2

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_24022	Hahnenbach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_26054	Hahnenknoop-Hetthorner-Moorkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_17006	Hahnenmoorgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26009	Hahner Bäke Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	1
Weser	DE_RW_DENI_26117	Hahner Bäke Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	1
Weser	DE_RW_DENI_16024	Hainholzbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_21052	Haller Bach (incl. Rambke)	N	N	N	N	–	p21,p26,p57	4	5	–	–	4	2	2
Weser	DE_RW_DENI_21051	Haller Fluss	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	2	2
Weser	DE_RW_DENI_22042	Halsebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_10020	Hamel Bach	N	N	N	N	–	p21,p22,p26,p57	4	5	–	–	4	4	3
Weser	DE_RW_DENI_10016	Hamel Fluss	N	N	Y	N	–	p21,p22,p26,p57	–	4	4	–	4	4	3
Weser	DE_RW_DENI_24054	Hamme I	N	N	N	N	–	p26,p57	5	5	–	–	4	1	1
Weser	DE_RW_DENI_24055	Hamme II	N	N	N	N	–	p26,p57	4	4	–	–	4	1	1
Weser	DE_RW_DENI_24056	Hamme III	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_19003	Hammenstedter Bach	N	N	N	N	–	p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_16033	Harlake	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18042	Harste	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_15017	Hasenbeeke	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	5	4	4	4
Weser	DE_RW_DENI_22027	Haßberger Hauptgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_08031	Hasselbach	–	N	–	N	–	p26	–	2	–	–	4	1	1
Weser	DE_RW_DENI_14034	Hasselbach	N	N	Y	Y	e20,e22	p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_17041	Hasselbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	1
Weser	DE_RW_DENI_24028	Hasselbach	N	N	N	N	–	p21,p26,p57	3	5	–	–	4	U	U
Weser	DE_RW_DENI_10017	Hastebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_21032	Haster Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12060	Hauptkanal	–	Y	–	N	–	p21,p26,p57	–	–	–	5	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_26103	Hauptpumpgraben Jaderaußendeich	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENI_25082	Hausbäke	N	N	Y	Y	e22	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_22028	Häußlinger Hauptvorfluter	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_26020	Hayenschlooter Sieltief / Eckwarder Sieltief Süd	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DEHE_488138.1	Hebenshäuser Bach	N	N	N	N	–	p2,p4,p21,p26	5	5	–	–	3	–	2
Weser	DE_RW_DENI_16022	Hechtgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_14013	Heestenmoorkanal	Y	Y	N	N	–	p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_14030	Hehlenriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_14036	Hehlinger Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_15048	Heiligendorfer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_25101	Heiligenloher Beeke	–	N	–	N	–	p21,p26,p57	–	4	–	–	4	U	1
Weser	DE_RW_DENI_21082	Heinser Bach	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_26104	Hekelner Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_18026	Helle (Hellenbach)	N	N	N	N	–	p26	4	U	–	–	4	U	U
Weser	DE_RW_DENI_10009	Hemeringer Bach	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DENI_25045	Hemmelb.Kanal / Hemmelsbäke + NG	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_16005	Hengstbeeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_20029	Hengstebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	4	4
Weser	DE_RW_DENI_10019	Herksbach	N	N	Y	N	–	p21,p26,p57	–	4	–	–	4	U	U
Weser	DE_RW_DENW4594_0_6	Herrengraben	N	N	Y	N	–	p9,p26,p55,p57,p58	–	5	–	–	3	–	2
Weser	DE_RW_DENI_13009	Herrenriede und Landriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_21078	Heßbach	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DEHE_43632.1	Hessenbeeke	N	N	N	N	–	p2,p4,p21,p26	4	5	–	–	3	–	2
Weser	DE_RW_DENI_10007	Heßlinger Bach	N	N	N	N	–	p26,p57	4	5	–	–	4	U	U
Weser	DE_RW_DENI_08019	Hilkenbach	N	N	N	N	–	p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_26110	Hinnebecker Fleth (Unterlauf)	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	2

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_26091	Hinnebecker Fleth Oberlauf	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_21044	Hirtenbach	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DENI_17057	Hohe Bach I	N	N	N	N	–	p26,p57	2	5	–	–	4	1	1
Weser	DE_RW_DENI_17058	Hohe Bach II	N	N	N	N	–	p26	2	2	–	–	4	1	1
Weser	DE_RW_DENI_26098	Hohens Tief / Poggenb. Leide + NG	Y	Y	N	N	–	p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_10008	Hollenbach	N	N	N	N	–	p21,p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_25083	Holler Moorkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_21020	Holpe-Hülse-Reeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_08015	Holzminde	N	N	Y	N	–	p26	–	2	3	–	4	U	U
Weser	DE_RW_DENI_23031	Hombach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_26097	Hooksieler Tief + NG	Y	Y	N	N	–	p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_26105	Hörsper Ollen	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_21015	Horster Bruchgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_16032	Horstgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26099	Horumer- / Grimmenser Tief + NG	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_17036	Hötzinger Aue	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DEHB_23018	Huchtinger Fleet	N	N	Y	Y	e20	p26,p49,p57	–	–	–	3	3	–	U
Weser	DE_RW_DENI_23017	Huchtinger Fleet Oberlauf mit Große Wasserlöse	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_17061	Hudemühlener Meiße und Feldgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_10014	Humme Bach	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_10012	Humme Fluss	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DEHE_41974.1	Hungershäuserbach	N	N	N	N	–	p2,p4,p21,p26	3	2	–	–	3	–	2
Weser	DE_RW_DENI_25002	Hunte ab Mittellandkanal	N	N	Y	Y	e26,e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_25073	Hunte Tidebereich	N	N	Y	Y	e24,e23,e20	p22,p26,p57	–	–	–	5	4	4	2
Weser	DE_RW_DENI_25080	Hunte von Dümmer bis Einmündung Grawiede	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	4	1
Weser	DE_RW_DENI_25017	Hunte von Einmündung Wimmerbach bis Dümmer	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_25019	Hunte von Grawiede bis Wildeshausen	N	N	Y	Y	e23,e20	p21,p22,p26,p57	–	–	–	4	4	4	1
Weser	DE_RW_DENI_25092	Hunte von Wildeshausen bis Ellenbäke	N	N	Y	Y	e26,e20	p21,p26,p57	–	–	–	4	4	2	1
Weser	DE_RW_DENI_25076	Hunte/ Staustrecke Kraftwerk Ol.	N	N	Y	Y	e26,e23,e20	p21,p22,p26,p57	–	–	–	4	4	4	1
Weser	DE_RW_DENI_25074	Hunte/ Wildeshausen - Wardenburg	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	1
Weser	DE_RW_DENI_25001	Hunte-Oberlauf	N	N	Y	N	–	p21,p26,p57	4	4	–	–	4	1	1
Weser	DE_RW_DENI_25060	Huntloser Bach	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_21047	Hüpeder Bach	N	N	N	N	–	p21,p26,p57	4	5	–	–	4	U	U
Weser	DE_RW_DENI_22044	Idsinger Bach	–	N	–	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_21079	Ihme	–	N	–	N	–	p21,p26,p57	–	4	–	–	4	U	U
Weser	DE_RW_DENI_18014	Ilme	N	N	N	N	–	p21,p26,p57	2	4	–	–	4	2	2
Weser	DE_RW_DENI_18019	Ilme	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_18027	Ilme	N	N	N	N	–	p26,p57	2	3	–	–	4	2	2
Weser	DE_RW_DENI_12054	Ils (Oberlauf in Nds.)	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_08002	Ilse	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DEST_WESOW21-00	Ilse- Unterlauf	N	N	Y	Y	e20	p1,p2,p3,p4	–	–	–	4	3	–	3
Weser	DE_RW_DENI_16027	Immensen-Arpk.Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_26115	Indiekkanal und neuer Indiekkanal	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_42004	Ingelheimbach	N	N	N	N	–	p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_20001	Innerste	N	N	Y	Y	e20	p22,p26,p57	–	–	–	4	4	4	3
Weser	DE_RW_DENI_20039	Innerste	N	N	Y	N	–	p26,p57	–	4	3	–	4	4	4
Weser	DE_RW_DENI_20045	Innerste	–	N	–	N	–	p21,p26,p57	–	4	–	–	4	4	4
Weser	DE_RW_DENI_20046	Innerste	–	N	–	N	–	p21,p22,p26,p57	–	4	–	–	4	4	4
Weser	DE_RW_DENI_25084	Ipweger Moorkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_14002	Ise	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_14003	Ise	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_14005	Isebeck	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_08022	Ithalbach	N	N	N	N	–	p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_26006	Jade	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	1
Weser	DE_RW_DENI_26116	Jade - Oberlauf / Rasteder Bäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	1
Weser	DE_RW_DENI_17013	Jafelbach	N	N	N	N	–	p26,p57	4	5	–	–	4	U	U
Weser	DE_RW_DENI_20034	Jerstedter Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_16007	Johannisgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_22017	Jordanbach	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_21003	Jürsenbach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_17012	Kainbach	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_20011	Kalte Beuster	N	N	N	N	–	p26	2	2	–	–	4	4	4
Weser	DE_RW_DENI_26027	Käseburger Sieltief + NG	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_25050	Katenbäke + NG	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	1
Weser	DE_RW_DENI_14037	Katharinenbach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_14040	Katharinenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Weser	DE_RW_DENI_16061	Katjefuhse	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_16055	Katzhorngraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENW46654_0_8	Kilverbach	N	N	N	N	–	p9,p21,p26,p55,p57	5	4	–	–	3	–	2
Weser	DE_RW_DENI_25042	Kimmerbäke, Brookbäke, Berne	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_21076	Kirchdorfer Mühlbach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_24068	Kirchenfleet	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_14019	Kleine Aller	N	N	Y	Y	e20	p13,p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_14022	Kleine Aller	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Weser	DE_RW_DENI_22012	Kleine Aue	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_13020	Kleine Aue Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_13021	Kleine Aue Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_14051	Kleine Brunsroderriede	N	N	Y	N	–	p21,p26,p57	–	4	4	–	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_12008	Kleine Eiter	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_17028	Kleine Örtze	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_19012	Kleine Steinau	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_19018	Kleine Steinau + Schindelgraben	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_13011	Kleine Wickriede Mittellauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_13012	Kleine Wickriede Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_13013	Kleine Wickriede Unterlauf und Bramkamper Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DEHB_24052	Kleine Wümme	N	N	Y	Y	e22	p9,p26,p57,p58,p72	–	–	–	3	3	–	U
Weser	DE_RW_DEHB_24053	Kleine Wümme	N	N	N	Y	e20	p9,p26,p49,p57,p72	–	–	–	3	3	–	1
Weser	DE_RW_DENI_23033	Klosterbach	–	N	–	N	–	p21,p26,p57	–	4	–	–	4	1	1
Weser	DE_RW_DENI_23013	Klosterbach Mittellauf	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_23007	Klosterbach Unterlauf / Varreler Bäke	N	N	Y	Y	e23,e20,e22	p21,p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_14006	Knesebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_25064	Korrbäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_16034	Kötjermühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_17018	Köttelbeck	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DENI_12009	Krähenkuhlenfleet	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_16043	Krähenriede	N	N	Y	Y	e22	p13,p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_19028	Krebsgraben	N	N	N	N	–	p26,p57	3	4	–	–	4	2	2
Weser	DE_RW_DENI_14028	Kronriede (Graben Nr.7)	N	N	Y	Y	e20	p13,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_15022	Krummbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_16042	Krummbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_18017	Krummes Wasser / Hillebach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_17060	Krusenhausener Bach mit Prahlbeeke	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_13018	Kuhbach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_13019	Kuhbach Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DEHB_24071	Kuhgraben	Y	Y	N	N	–	p26,p49,p57	–	–	–	3	3	–	U
Weser	DE_RW_DENI_13039	Kuhlenkamper Beeke und Päpser Bach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_20008	Kupferstrang (Trilkeb.)	Y	Y	N	N	–	p26,p57	–	–	–	5	4	3	3
Weser	DE_RW_DENI_25075	Küstenkanal östl. Vehnedüker	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	2
Weser	DE_RW_DENI_15060	Laagschunter	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_17010	Lachte I	N	N	Y	N	–	p26	–	2	3	–	4	1	1
Weser	DE_RW_DENI_17011	Lachte II	N	N	N	N	–	p26,p57	3	3	–	–	4	1	1
Weser	DE_RW_DENI_11006	Laerbach und Twisselbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25016	Lahrer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_20044	Lakebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_20012	Lamme	N	N	Y	Y	e22	p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_20015	Lamme	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	4	4
Weser	DE_RW_DENI_25059	Landriede	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_12006	Landwehr mit Steinwätern	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_17031	Landwehrbach	N	N	Y	N	–	p26,p57	–	3	3	–	4	2	1
Weser	DE_RW_DENI_25062	Landwehrbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_21043	Landwehrgraben	N	N	Y	Y	e22	p26,p57	–	–	–	2	4	U	U
Weser	DE_RW_DENI_15005	Lange	N	N	N	N	–	p26	2	2	–	–	4	4	4
Weser	DE_RW_DENI_15056	Lange Welle (Mittelgraben)	N	N	Y	Y	e20	p8,p13,p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_19029	Langenhagen-Hilkeröder Bach	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_13010	Langer Graben und Schafdammgraben	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_13002	Langhorst-Kuhlengraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_14042	Lapau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_14043	Lapau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_26077	Lavener Sielgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_25094	Lecker Mühlbach Oberlauf	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	1	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_25004	Lecker Mühlbach Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_23019	Leester Mühlenbach mit Unterlauf Hombach und Gänsebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_22043	Lehrde I	–	N	–	N	–	p26,p57	–	4	–	–	4	2	2
Weser	DE_RW_DENI_22032	Lehrde II	N	N	N	N	–	p21,p26,p57	2	3	–	–	4	2	2
Weser	DE_RW_DENI_16026	Lehrter Bach	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_18001	Leine	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_18057	Leine	N	N	Y	Y	e23,e20,e22	p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_18058	Leine	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_18059	Leine	N	N	N	N	–	p21,p22,p26,p57	3	3	–	–	4	4	4
Weser	DE_RW_DENI_18060	Leine	N	N	N	N	–	p21,p22,p26,p57	3	3	–	–	4	4	4
Weser	DE_RW_DENI_21060	Leine Bergl.	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	2	2
Weser	DE_RW_DENI_21068	Leine, Despe-Innerste	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_21019	Leine, Ihme-Westaue	N	N	N	N	–	p26,p57	3	4	–	–	4	2	2
Weser	DE_RW_DENI_21069	Leine, Innerste-Ihme	N	N	Y	Y	e20,e22	p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_21001	Leine, Westaue-Aller	N	N	N	N	–	p21,p22,p26,p57	4	5	–	–	4	4	3
Weser	DE_RW_DENI_08033	Lenne Oberlauf mit Mittellauf	–	N	–	N	–	p21,p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_08032	Lenne Unterlauf	–	N	–	N	–	p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_24007	Lesum und Hamme	N	N	Y	Y	e24,e23	p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_17052	Liethbach	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_25053	Lohmühlenbach	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	2	1
Weser	DE_RW_DENI_21039	Lohnder Bach	N	N	N	N	–	p21,p26,p57	4	5	–	–	4	U	U
Weser	DE_RW_DENI_25065	Lohne	N	N	Y	Y	e28,e20,e22	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_08011	Lonaubach	N	N	N	N	–	p26	2	2	–	–	4	U	U
Weser	DE_RW_DENI_26042	Lune Mittellauf 1	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_26043	Lune Mittellauf 2	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_26118	Lune Oberlauf		N		Y	e20	p26,p57	–	–	–	4	4	1	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_26044	Lune Unterlauf 1	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_26045	Lune Unterlauf 2	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_24015	Lünzener Bruchbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_15054	Lutter	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_15055	Lutter	N	N	Y	Y	e22	p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_17015	Lutter	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_18045	Lutter	N	N	Y	Y	e22	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_18046	Lutter	N	N	Y	Y	e20,e22	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_20024	Lutter	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_19023	Lutter + Krumme Lutter	N	N	N	N	–	p26,p57	2	4	–	–	4	U	U
Weser	DE_RW_DENI_26002	Maade / Upjeversches Tief	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12016	Mahler Graben	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_10011	Mainbach	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_19006	Markau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_20027	Markau	N	N	N	N	–	p26,p57	3	3			4	U	U
Weser	DE_RW_DEHB_24070	Maschinenfleet	Y	Y	N	N	–	p9,p26,p49,p57	–	–	–	3	3	–	1
Weser	DE_RW_DENI_22040	Meesegraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_24018	Mehlandsbach	N	N	Y	N	–	p21,p26,p57	–	4	4	–	4	1	1
Weser	DE_RW_DENI_12030	Mehringer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_18002	Meierbach	N	N	N	N	–	p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_17055	Meierbach I	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_17056	Meierbach II	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_18007	Meine	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_17049	Meiße Mittellauf	N	N	N	N	–	p26,p57	2	3	–	–	4	1	1
Weser	DE_RW_DENI_17048	Meiße Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_17050	Meiße Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_26090	Meyenburger Mühlengraben	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	2
Weser	DE_RW_DENI_26081	Misselwardener Wasserlöse	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_16057	Mittelandkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_12042	Mittellandkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_14047	Mittellandkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_21071	Mittellandkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_25013	Mittellandkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_12035	Mittellauf Rottbach (Mittellauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12046	Mittelweser zwischen Aller und Bremen	N	N	Y	Y	e24,e23	p13,p22,p26,p57	–	–	–	4	4	4	3
Weser	DE_RW_DENI_12001	Mittelweser zwischen Aller und NRW	N	N	Y	Y	e24,e23	p13,p21,p22,p26,p57	–	–	–	5	4	4	3
Weser	DE_RW_DENI_22021	Moorbeeke	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18031	Moore	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_25029	Mooriemer Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_24034	Moorkanal	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25025	Moorkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_13016	Moorkanal zur Flöte	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_21038	Möseke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26037	Motzener Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_17008	Müdener Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_17043	Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENI_26092	Mühlenfleth	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_15058	Mühlengraben	N	N	Y	Y	e20	p8,p13,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_16008	Mühlengraben/Trendelgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_15019	Mühlenilse	N	Y	Y	N		p21,p26,p57	–	–	–	5	4	4	4
Weser	DE_RW_DENI_14032	Mühlenriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_14033	Mühlenriede	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_24051	Müllersdammgraben und Tüschendorf-Worphauser Graben	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_19034	Muse	N	N	N	N	–	p21,p26,p57	4	5	–	–	4	U	U
Weser	DE_RW_DENI_10010	Nährenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25102	Natenstedter Beeke		N		N	–	p21,p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_19035	Nathe	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_19036	Nathe	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_20030	Neile	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENI_20032	Neile	N	N	N	N	–	p26,p57	2	3	–	–	4	4	4
Weser	DE_RW_DENI_15049	Neindorfer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_13004	Nendorfer Moorkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_20018	Nette	N	N	N	N	–	p21,p22,p26,p57	4	4	–	–	4	4	3
Weser	DE_RW_DENI_20023	Nette	N	N	Y	N	–	p21,p22,p26,p57	–	4	5	–	4	4	3
Weser	DE_RW_DEHB_26082	Neue Aue	N	N	Y	Y	e22	p9,p26,p49,p57,p58,p72	–	–	–	4	3	–	U
Weser	DE_RW_DENI_16017	Neue Aue	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_21011	Neue Auter	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_26028	Neue Heete	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25036	Neuenhuntorfer Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_22022	Neuer Eilter Graben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24069	Neugrabenfleet	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26101	Neustädter- / Gödenser Tief	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_08026	Nieme	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_23034	Nienstedter Beeke	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DEHE_4298.1	Nieste	N	N	N	N	–	p2,p4,p26	3	3	–	–	3	–	2
Weser	DE_RW_DENI_26013	Nordender Leke Mittellauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26012	Nordender Leke Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26113	Nordgeorgsfehn-/Großefehnkanal	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_17044	Obere Drebber	Y	N	N	Y	e20	p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_12013	Obere Eiter (Oberlauf)	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_25063	Obere Lethe + NG	N	N	N	N	–	p21,p22,p26,p57	3	4	–	–	4	4	1
Weser	DE_RW_DENI_26010	Obere Wapel + NG (Bekhauser Bäke)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	1
Weser	DE_RW_DENI_26072	Obere Wittgeeste	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DEHB_23030	Ochtum	Y	Y	N	N	–	p26,p49	–	–	–	3	3	–	1
Weser	DE_RW_DENI_23020	Ochtum Oberlauf	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_23001	Ochtum Tidebereich	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_19009	Oder	N	N	N	N	–	p21,p22,p26,p57	2	3	–	–	4	3	3
Weser	DE_RW_DENI_19024	Oder	N	N	N	N	–	p22,p26,p57	2	4	–	–	4	3	3
Weser	DE_RW_DENI_19027	Oder	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_19026	Oder bis Talsperre	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_19046	Oderteich	N	N	Y	Y	e30,e29	p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_19039	Oehrsche Beeke	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	2	2
Weser	DE_RW_DENI_20028	Oelberbach	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	5	4	4	4
Weser	DE_RW_DENI_21054	Oeseder Bach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	2	2
Weser	DE_RW_DENI_25032	Ofener Bäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25031	Ofenerdieker Bäke	N	N	Y	Y	e22	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_15044	Ohe/Losebach	N	N	Y	N	–	p26,p57	–	3	4	–	4	U	U
Weser	DE_RW_DENI_15013	Ohebach	N	N	Y	Y	e20	p21,p26,p57	–	–	5	3	4	4	4
Weser	DE_RW_DENI_15001	Oker	N	N	Y	Y	e20,e22	p21,p22,p26,p57	–	–	4	4	4	4	4
Weser	DE_RW_DENI_15002	Oker	N	N	Y	N	–	p13,p26,p57	–	3	3	–	4	4	4
Weser	DE_RW_DENI_15036	Oker ab Schunter	N	N	Y	N	–	p21,p22,p26,p57	–	3	4	–	4	4	4
Weser	DE_RW_DENI_15035	Oker bis Talsperre	N	N	Y	N	–	p26,p57	–	3	3	—	4	U	U
Weser	DE_RW_DENI_26122	Oldendorfer Bach	–	N	–	Y	e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_26106	Ollen	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_20022	Ortshäuser Bach	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_17026	Örtze	N	N	N	N	–	p26	2	2	–	–	4	2	1
Weser	DE_RW_DENI_17025	Örtze inkl. Ilster	N	N	N	N	–	p26	2	2	–	–	4	2	1
Weser	DE_RW_DENI_24057	Oste-Hamme-Kanal und Augustendorfer Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25011	Osterdammer Bergbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_21031	Osterriehe	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_25068	Östlicher Vorfluter	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_22037	Otersener Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_24082	Otterstedter Beeke	–	N	–	N	–	p21,p26,p57	–	4	–	–	4	U	U
Weser	DE_RW_DENI_26086	Oxstedter Bach Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26087	Oxstedter Bach Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12020	Oyler Mühlenbach-Seegraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_13029	Peeksriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_16040	Pisserbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25077	Pissing	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_16036	Plockhorster-Eltzner Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_25047	Poggenpohls Moor WZ.	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_21028	Pohler Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_17065	Pollhöfer Grenzgraben	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_26125	Quabbenbeek	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_17020	Quarmbach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_15006	Radau	N	N	Y	N	–	p13,p26,p57	–	3	3	–	4	4	4
Weser	DE_RW_DENI_25088	Randgraben / 4969492	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_23002	Randgraben / Kamerner Bäke	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25041	Randgraben Ost / Berne	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25012	Randkanal mit Kreisgrenzgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	1	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_18048	Rase	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_24042	Rautendorfer Schiffgraben	Y	Y	N	N	–	p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_18015	Rebbe	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	2	2
Weser	DE_RW_DENI_26031	Reepsholter Tief	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_08023	Rehbach I+II;Malliehagenb.	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_24033	Rehengraben	Y	N	N	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24012	Rehrbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENI_08018	Reiherbach I+II	N	N	N	N	–	p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_17068	Reiniger Moorgraben	–	N	–	Y	e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_24035	Reithbach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24062	Reithbach	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	1	1
Weser	DE_RW_DENI_10018	Remte	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_12052	Rennriehe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_19041	Renshausener Bach	N	N	N	N	–	p21,p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DENI_12011	Retzer Bach (Oberlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_21067	Rheinbach	N	N	N	N	–	p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_25023	Rhien	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_19001	Rhume	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	2	2
Weser	DE_RW_DENI_19051	Rhume	N	N	N	N	–	p21,p22,p26,p57	3	3	–	–	4	4	3
Weser	DE_RW_DENI_21016	Ricklinger Mühlengraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_23022	Rieder Umleiter mit Rieder Grenzgraben und Kampgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_20014	Riehe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENW4746_0_8	Riehe	N	N	Y	Y	e20	p9,p21,p26,p27,p57	–	–	–	5	3	–	2
Weser	DE_RW_DENI_18028	Riepenbach	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_21027	Riesbach	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_14009	Riet	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	1	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_17053	Riethbach	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_10001	Rintelner Herrengraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_26034	Rispeler Tief / Mahnmalschloot	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_25046	Rittrumer Mühlbach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_16002	Rixfördergraben	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_24074	Rodau	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_18034	Rodebach	N	N	Y	Y	e22	p13,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18035	Rodebach	N	N	N	N	–	p13,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_21025	Rodenberger Aue Bach Oberlauf	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_21024	Rodenberger Aue Mittellauf	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_21023	Rodenberger Aue Unterlauf	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_10006	Rohder Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DEHB_26057	Rohr	N	N	N	Y	e20	p9,p26,p49,p57	5	–	–	5	3	–	U
Weser	DE_RW_DENI_26056	Rohr Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_13037	Rohrbach	–	N	–	Y	e20	p26,p57	–	–	–	2	4	U	U
Weser	DE_RW_DENI_21050	Rössingbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_12053	Rothe	N	N	N	N	–	p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DENI_15027	Rothebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_12036	Rottbach (Oberlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_18016	Rotte	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	2	2
Weser	DE_RW_DENI_20020	Rottebach	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_08017	Rottmünde	N	N	Y	N	–	p26,p57	–	4	–	–	4	U	U
Weser	DE_RW_DENI_24058	Rummeldeisbeek I	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24059	Rummeldeisbeek II	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_24073	Ruschwede	–	N	–	N	–	p21,p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_13007	Rüsselbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_21056	Saale Bach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	2	2
Weser	DE_RW_DENI_21055	Saale Fluss	N	N	Y	N	–	p21,p26,p57	–	4	–	–	4	2	2
Weser	DE_RW_DENI_21083	Saale Oberlauf	–	N	–	N	–	p21,p26,p57	–	4	–	–	4	2	2
Weser	DE_RW_DENI_25091	Sager Meerkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_21026	Salzbach	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_15046	Sandbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_12051	Sandfurthbach	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_19050	Sandwasser (Hartmannkanal)	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_16048	Sangebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_13006	Sarninghäuser Meerbach und Nebengewässer	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_14011	Sauerbach	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_15031	Sauerbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_21070	Saugraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_12023	Schäfergraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_20026	Schaller	N	N	Y	N	–	p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_15012	Schamlahbach	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENI_16029	Schanze	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_24066	Scharmbecker Bach I	N	N	Y	Y	e22	p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_24067	Scharmbecker Bach II	N	N	N	N	–	p26,p57	5	5	–	–	4	1	1
Weser	DE_RW_DENI_08027	Schede	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_26124	Scheidebach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_15050	Scheppau	N	N	N	Y	e20	p21,p26,p57	4	–	–	3	4	2	2
Weser	DE_RW_DENI_12038	Schermbecke	N	N	Y	N	–	p21,p26,p57	–	5	3	–	4	U	U
Weser	DE_RW_DENI_14041	Schieferbrunnenriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_15039	Schierpkebach	N	N	Y	N	–	p26	–	2	5	–	4	U	U
Weser	DE_RW_DENI_15061	Schierpkebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_16013	Schiffgraben	N	N	Y	Y	e22	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_12047	Schiffgraben (Hochmoorgewässer)	Y	Y	N	N	–	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_15018	Schiffgraben West/Neuer Gr.	N	Y	Y	N	–	p21,p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENI_26029	Schiffsbalje	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_20025	Schildau	N	N	Y	N	–	p26,p57	–	3	4	–	4	U	U
Weser	DE_RW_DENI_22026	Schipsegraben	N	N	Y	Y	e20	p21,p26,p57	–	–	5	5	4	2	2
Weser	DE_RW_DENI_18056	Schleierbach	N	N	N	N	–	p21,p26,p57	2	4	–	–	4	2	2
Weser	DE_RW_DENI_21037	Schleifbach	N	N	Y	Y	e20	p21,p26,p57	–	–	4	4	4	U	U
Weser	DE_RW_DENW47512_0_4	Schleusenkanal Schlüsselburg	Y	Y	N	N	–	p26	–	–	4	U	3	–	2
Weser	DE_RW_DENI_12050	Schloßbach	N	N	Y	Y	e20	p21,p26,p57	–	–	5	5	4	U	U
Weser	DE_RW_DENI_19007	Schlungwasser	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_17017	Schmalwasser mit Räderbach	N	N	Y	N	–	p26,p57	–	3	3	–	4	U	U
Weser	DE_RW_DENI_17032	Schmarbeck	N	N	Y	N	–	p26,p57	–	4	3	–	4	2	1
Weser	DE_RW_DENI_24060	Schmoo	N	N	N	N	–	p21,p26,p57	4	5	–	–	4	1	1
Weser	DE_RW_DENI_24061	Schmoo / Reithbach (Unterläufe)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_16051	Schneegraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_16044	Schölke/SZ	N	N	Y	Y	e22	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_14038	Schomburgriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DEHB_26111	Schönebecker Aue	N	N	Y	Y	e22	p21,p26,p57,p58	–	–	–	4	3	–	U
Weser	DE_RW_DENI_26095	Schönebecker Aue Oberlauf	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_23035	Schorlingborsteler Beeke	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18039	Schöttelbach	N	N	N	N	–	p26,p57	5	5	–	–	4	U	U
Weser	DE_RW_DENI_15051	Schunter	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_15059	Schunter	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_26093	Schwaneweder Beeke	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_22025	Schwarze Riede	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	1	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_16038	Schwarzwasser	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_17004	Schwarzwasser I	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_17005	Schwarzwasser II	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_25009	Schweger Marschkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26019	Schweiburger Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24075	Schweinekobenbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_13017	Schweringhäuser Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_08025	Schwülme Oberlauf	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_08020	Schwülme Unterlauf	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	2	2
Weser	DE_RW_DENI_08024	Schwülme/Auschnippe	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	2	2
Weser	DE_RW_DENI_10028	Sedemünder Mühlbach	–	N	–	N	–	p21,p26,p57	–	4	–	–	4	U	U
Weser	DE_RW_DENI_16023	Seebeck	N	N	Y	Y	e21	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_26073	Sellstedter Seekanal	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_24065	Semkenfahrt	Y	Y	N	N	–	p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_20019	Sennebach	N	N	N	N	–	p26,p57	4	5	–	–	4	U	U
Weser	DE_RW_DENI_19011	Sieber	N	N	N	N	–	p21,p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_19013	Sieber	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_19014	Sieber	N	N	N	N	–	p26,p57	2	5	–	–	4	U	U
Weser	DE_RW_DENI_19016	Sieber	N	N	N	N	–	p26,p57	1	4	–	–	4	U	U
Weser	DE_RW_DENI_13038	Siede	–	N	–	Y	e20	p21,p22,p26,p57	–	–	–	3	4	3	2
Weser	DE_RW_DENI_13028	Siede Unterlauf	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	2
Weser	DE_RW_DENI_23012	Siekgraben Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_23029	Siekgraben Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26080	Sieverner Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_08003	Sievershagener Bach	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_22010	Soltau	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_19031	Soolbach	N	N	N	N	–	p21,p26,p57	5	4	–	–	4	U	U
Weser	DE_RW_DENI_19004	Söse	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	3	4	4	3
Weser	DE_RW_DENI_19019	Söse	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_19045	Söse	N	N	N	N	–	p22,p26,p57	4	4	–	–	4	4	3
Weser	DE_RW_DENI_17014	Sothbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_17030	Sothrieth mit südlichem Quellbach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_13027	Speckenbach	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	2
Weser	DE_RW_DENI_17027	Speckenmoorgraben	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_19025	Sperrlutter	N	N	N	N	–	p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_20040	Spiegeltaler Graben	N	N	N	N	–	p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_26088	Spiekaer Wasserlöse und Nördl. Grauwallgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_08010	Spiekersiek	N	N	N	N	–	p26	3	2	–	–	4	U	U
Weser	DE_RW_DENI_08004	Spüligbach	N	N	N	N	–	p21,p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_18024	Spüligbach	N	N	N	N	–	p21,p26,p57	2	3	–	–	4	U	U
Weser	DE_RW_DENI_18025	Spüligbach	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_14035	Steekgraben/Hehlinger Bach	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_12025	Steertschlaggraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_22020	Steimbker Dorfgraben	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_20031	Steimker Bach/Kiefbach	N	N	Y	N	–	p26,p57	–	3	–	–	4	4	4
Weser	DE_RW_DENI_22016	Steinförthsbach	N	N	Y	N	–	p21,p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DENI_26100	Steinhauser Tief + NG / Marsch	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12044	Steinhuder Meerbach (Oberlauf)	N	N	Y	Y	e23,e20,e21	p22,p26,p57	–	–	–	4	4	4	1
Weser	DE_RW_DENI_12021	Steinhuder Meerbach Mittel- und Unterlauf	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	4	1
Weser	DE_RW_DENI_24008	Stellbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_16056	Steterburgergraben	N	N	N	Y	e20	p21,p26,p57	5	–	–	4	4	U	U
Weser	DE_RW_DENI_21072	Stichkanal Hannover-Linden	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_16059	Stichkanal Hildesheim	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_20042	Stichkanal Hildesheim	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_16058	Stichkanal Salzgitter	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DEST_WESOW24-00	Stimmecke	N	N	Y	N	–	p1,p2,p4	–	3	–	–	3	–	2
Weser	DE_RW_DENI_26126	Stinstedter Bach	–	N	–	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_15023	Stobenbergbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENI_21075	Stockbach	N	N	N	N	–	p26,p57	4	3	–	–	4	U	U
Weser	DE_RW_DENI_18029	Stöckheimer Bach (Salzgraben)	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_12028	Strangbach	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_26025	Strohauser Sieltief + NG	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_18018	Stroiter Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25006	Strothbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_23016	Stuhrgraben mit Große Rönnecken	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_21036	Südaue Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_21035	Südaue Fluss	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_12029	Südbach	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26014	Südender Leke Mittellauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_26011	Südender Leke Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_17046	Südkanal	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_13032	Sudriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Weser	DE_RW_DENI_19043	Suhle	N	N	N	N	–	p21,p26,p57	4	5	–	–	4	U	U
Weser	DE_RW_DENI_17037	Suhrbach	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_13022	Sule Oberlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_13023	Sule Unterlauf und Flöte bei Lindern	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_23023	Süstedter Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_11002	Suttbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_14055	Talgraben links der Aller	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_14050	Talgraben rechts der Aller	Y	Y	N	N	–	p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_15047	Teichgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_15033	Thiedebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_16020	Thöse	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_22036	Thransgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_21084	Thüster Beeke	–	N	–	N	–	p21,p26,p57	–	5	–	–	4	U	U
Weser	DE_RW_DENI_16004	Tiefenbruchgraben	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_20035	Töllebach	N	N	Y	Y	e20,e22	p26,p57	–	–	–	3	4	4	4
Weser	DE_RW_DENI_21007	Totes Moor, Hauptvorfluter	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_17029	Trauener Graben	Y	Y	N	N	–	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_14015	Triangelermoorkanal	Y	Y	N	N	–	p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_24021	Trochelbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_25079	Tüske Oberlauf	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_25090	Tweelbäke oberh. Tweelb. See	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENW45372_0_8	Twierbach	N	N	N	N	–	p9,p26	5	5	–	–	3	–	2
Weser	DE_RW_DENW4592_0_6	Twiesbach	N	N	Y	Y	e20	p21,p22,p57,p26	–	–	–	4	3	–	2
Weser	DE_RW_DENI_25061	Twillbäke	N	N	N	N	–	p21,p26,p57	3	4	–	–	4	U	U
Weser	DE_RW_DENI_12033	Uchter Mühlenbach (alter Unterlauf n. Stolzenau)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_13005	Uchter Mühlenbach Oberlauf und Nebengewässer	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_19002	Uhbach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_11007	Uhlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_15053	Uhrau	N	N	Y	Y	e20	p13,p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_24063	Umbeck	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_18037	Ummelbach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_20003	Unsinnbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	3	3

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_17047	Untere Drebber	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_25067	Untere Lethe	N	N	Y	Y	e23,e20	p21,p22,p26,p57	–	–	–	4	4	4	1
Weser	DE_RW_DENI_25037	Untere Ollen / Berne	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_23027	Unterlauf Delme, Tidebereich	N	N	Y	Y	e23,e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_23021	Unterlauf Hache	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENI_25038	Unterlauf Tüske	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26005	Vareler Tief + NG / Marsch	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DEHB_23026	Varreler Bäke	N	N	Y	Y	e20	p26,p57,p72	–	–	–	4	3	–	U
Weser	DE_RW_DENI_21008	Varrenbruchgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_25015	Vechtaer Grenzgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_24014	Veerse	N	N	N	N	–	p21,p26,p57	2	3	–	–	4	2	1
Weser	DE_RW_DENI_25093	Venner Mühlenbach / Elze Oberlauf	N	N	Y	N	–	p21,p26,p57	–	3	3	–	4	1	1
Weser	DE_RW_DENI_26085	Verbindungsgraben einschl. Cappeler Wasserlöse	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_22034	Vethbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_22035	Vethbach mit Thransgraben (Unterläufe)	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_14026	Viehmoorgraben	Y	Y	N	N	–	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_11005	Violenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_24025	Visselbach	N	N	Y	Y	e20	p8,p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_14027	Vollbütteler Riede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_14024	Vorderer Drömlingsgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_17023	Vorwerker Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_15045	Wabe	N	N	Y	N	–	p26,p57	–	4	5	–	4	U	U
Weser	DE_RW_DENI_15041	Wabe/Mittelriede	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_25026	Wagenfelder Aue	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_25024	Wagenfelder Aue Oberlauf, Flöthe und Hemsloher Bruchgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_12027	Wahlenbach und Finkalenheidegraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_24081	Walle	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_24079	Walle Unterlauf	–	N	–	N	–	p26,p57	–	3	–	–	4	1	1
Weser	DE_RW_DENI_21029	Waltershagenerbach	N	N	N	N	–	p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_18013	Wambach	N	N	N	N	—	p21,p26,p57	4	4	–	–	4	U	U
Weser	DE_RW_DENI_26102	Wapel Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	1
Weser	DE_RW_DENI_17067	Warmbeck	–	N	–	Y	e20	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_20010	Warme Beuster	N	N	N	N	–	p26,p57	2	3	–	–	4	4	4
Weser	DE_RW_DENW4666_0_18	Warmenau	N	N	Y	Y	e20,e26	p8,p9,p13,p21,p26,p27,p55,p57	–	–	–	5	3	–	2
Weser	DE_RW_DENI_22014	Warnau	N	N	Y	N	—	p26,p57	–	3	3	–	4	U	2
Weser	DE_RW_DENI_15021	Warne	N	N	Y	Y	e20	p8,p13,p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_15024	Warne	N	N	Y	N	–	p26,p57	–	5	4	–	4	4	4
Weser	DE_RW_DENI_21063	Warnebach	N	N	Y	Y	e22	p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_22039	Wätern	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Weser	DE_RW_DENI_16060	Wathlinger Poldergraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_15014	Weddebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	4	4
Weser	DE_RW_DENI_15040	Weddeler Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_18040	Weende	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_18041	Weende	N	N	Y	Y	e22	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_17040	Weesener Bach	N	N	N	N	–	p26	2	2	–	–	4	2	1
Weser	DE_RW_DENI_16037	Wehnserbach-Dedenhäuser Graben	N	N	Y	N	–	p21,p26,p57	–	5	5	–	4	U	U
Weser	DE_RW_DENI_24040	Weidebach	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_22023	Weißer Graben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_26046	Wellener Bach Oberlauf	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_26047	Wellener Bach Unterlauf	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_23008	Welse + Nutteler Nebenzug	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	3	4	4	3

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_18052	Wendebach	N	N	Y	Y	e28	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_18053	Wendebach (mit Thüringen)	N	N	N	N	–	p26,p57	3	4	–	–	4	2	2
Weser	DE_RW_DENI_21080	Wennigser Mühlbach	–	N	–	N	–	p26,p57	–	3	–	–	4	U	U
Weser	DE_RW_DEHE_41.1	Werra/Niedersachsen	N	N	N	N	–	p1,p2,p4,p8,p21,p26	5	5	–	–	3	–	2
Weser	DE_RW_DENI_08001	Weser	N	N	Y	Y	e24	p13,p21,p22,p26,p57	–	–	–	5	4	4	3
Weser	DE_RW_DENI_10003	Weser	N	N	Y	Y	e24,e20	p13,p21,p22,p26,p57	–	–	–	5	4	4	3
Weser	DE_RW_DENI_26035	Weser / Tidebereich oberh. Brake	N	N	Y	Y	e24,e23	p22,p26,p57	–	–	–	4	4	3	2
Weser	DE_RW_DENI_21018	Westaue Fluss	N	N	Y	N	–	p21,p26,p57	–	4	5	–	4	2	2
Weser	DE_RW_DENI_22030	Westener Wetterbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_25003	Westerbach / Wehrendorfer Mühlbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_24017	Westerholzer Kanal	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENW4764_0_8	Wickriede	–	N	–	Y	e20,e21	p9,p26,p55,p57	–	–	–	4	3	–	2
Weser	DE_RW_DENW4764_12_24	Wickriede	–	N	–	Y	e20	p9,p21,p26,p27,p55,p57	–	–	–	5	3	–	3
Weser	DE_RW_DENW4764_5_15	Wickriede	N	N	Y	Y	e20	p9,p21,p26,p27,p57	–	–	–	5	3	–	3
Weser	DE_RW_DENI_24019	Wiedau	N	N	Y	N	–	p21,p26,p57	–	4	3	–	4	1	1
Weser	DE_RW_DENI_22002	Wiedenhausener Bach I	N	N	Y	N	–	p26,p57	–	4	4	–	4	2	2
Weser	DE_RW_DENI_22003	Wiedenhausener Bach II	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	2	2
Weser	DE_RW_DENI_17064	Wiehe	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_22029	Wiehegraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_17009	Wienhausener Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_16009	Wiesenbach bis HW-Abschlag	N	N	Y	Y	e20	p21,p26,p57	–	–	–	U	4	U	U
Weser	DE_RW_DENI_15043	Wiesengraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_16014	Wiesengraben/Mehlbeeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_24039	Wieste Oberlauf	N	N	Y	N	–	p21,p26,p57	–	4	4	–	4	1	1
Weser	DE_RW_DENI_24078	Wieste Unterlauf	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_13031	Wiete / Schnatgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Weser	DE_RW_DENI_16001	Wietze	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	3	4	3	1
Weser	DE_RW_DENI_16012	Wietze	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	3	4	3	1
Weser	DE_RW_DENI_16011	Wietze Graben/Laher Gr.	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	1
Weser	DE_RW_DENI_17033	Wietze/ Ö. I	N	N	Y	N	–	p26,p57	–	4	4	–	4	2	1
Weser	DE_RW_DENI_17034	Wietze/ Ö. II	N	N	N	N	–	p26,p57	2	3	–	–	4	2	1
Weser	DE_RW_DENI_24050	Wilstedtermoorer Schiffgraben und Saatmoorgraben	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	1
Weser	DE_RW_DENI_25095	Wimmerbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Weser	DE_RW_DENI_13036	Winterbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_18003	Winzenburger Bach	N	N	N	N	–	p26,p57	3	3	–	–	4	U	U
Weser	DE_RW_DENI_12041	Winzlarer Grenzgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_14023	Wipperaller	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_21064	Wispe	N	N	Y	Y	e22	p21,p26,p57	–	–	–	3	4	U	U
Weser	DE_RW_DENI_21066	Wispe Oberlauf	N	N	N	N	–	p26	3	2	–	–	4	U	U
Weser	DE_RW_DENI_22024	Wölpe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Weser	DE_RW_DENI_26017	Woppenkamper Bäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENW456944_0_4	Wörmke	–	N	–	N	–	p26,p57	–	U	–	–	3	–	2
Weser	DE_RW_DENI_24048	Wörpe I	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	4	1
Weser	DE_RW_DENI_24049	Wörpe II	N	N	Y	Y	e20	p22,p26,p57	–	–	–	4	4	4	1
Weser	DE_RW_DENI_26083	Wremer Wasserlöse	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Weser	DE_RW_DENI_16003	Wulbeck	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_16006	Wulbeck	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	U	1
Weser	DE_RW_DENI_25030	Wulfsgraft / Geestrandgr.	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Weser	DE_RW_DENI_24001	Wümme I	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	2	1
Weser	DE_RW_DENI_24002	Wümme II (mit Todtgraben)	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	2	1
Weser	DE_RW_DENI_24003	Wümme III	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	2	1
Weser	DE_RW_DENI_24004	Wümme IV	N	N	Y	N	–	p26,p57	–	3	3	–	4	2	1

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Weser	DE_RW_DENI_24006	Wümme V	N	N	N	N	–	p26,p57	4	4	–	–	4	1	1
Weser	DE_RW_DENI_24043	Wümme-Mittelarm	N	N	N	N	–	p26,p57	3	3	–	–	4	1	1
Weser	DE_RW_DENI_24038	Wümme-Nordarm II	N	N	Y	N	–	p26,p57	–	3	4	–	4	1	1
Weser	DE_RW_DENI_24005	Wümme-Südarm	N	N	Y	Y	e20	p26,p57	–	–	–	3	4	1	1
Weser	DE_RW_DENI_20041	Zellbach	N	N	Y	N	–	p26,p57	–	4	3	–	4	U	U
Weser	DE_RW_DENI_26018	Zeteler Tief Oberlauf + NG	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Weser	DE_RW_DENI_21021	Ziegenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Weser	DE_RW_DENI_15016	Zieselbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	4	4
Standing waters															
Weser	DE_LW_DENI_15063	Baggersee östlich von Schladen	Y	Y	N	N	–	p26,p49,p84	–	–	2	2	4	U	U
Weser	DE_LW_DENI_12056	Baggersee bei Stolzenau	Y	Y	N	N	–	p21,p26	–	–	4	4	4	U	U
Weser	DE_LW_DENI_25018	Dümmer	N	N	N	N	–	p21,p26	4	5	–	–	4	1	1
Weser	DE_LW_DENI_15008	Eckertalsperre	N	N	Y	Y	e23,e26,e27,e30	p26,p49	–	–	2	2	4	U	U
Weser	DE_LW_DENI_20036	Granetalsperre	N	N	Y	Y	e23,e26,e27,e30	p26,p49	–	–	2	2	4	U	U
Weser	DE_LW_DENI_19053	Großer See	Y	Y	N	N	–	p21,p26,p58	–	–	3	3	4	U	U
Weser	DE_LW_DENI_20038	Innerstetalsperre	N	N	Y	Y	e23,e26,e27,e30	p26,p49	–	–	2	2	4	U	U
Weser	DE_LW_DENI_21073	Koldinger Kiessee	Y	Y	N	N	–	p26,p49,p84	–	–	2	3	4	1	1
Weser	DE_LW_DENI_21074	Maschsee	Y	Y	N	N	–	p21,p26,p58,p84,p89	–	–	3	3	4	2	2
Weser	DE_LW_DENI_19047	Odertalsperre	N	N	Y	Y	e26,e23	p26,p49	–	–	2	2	4	U	U
Weser	DE_LW_DENI_15004	Okertalsperre	N	N	Y	Y	e23,e26,e27,e30	p26,p49	–	–	2	2	4	U	U
Weser	DE_LW_DENI_19049	Sösetalsperre	N	N	Y	Y	e23,e26,e27,e30	p26,p49	–	–	2	2	4	U	U
Weser	DE_LW_DENI_16064	Salzgittersee	Y	Y	N	N	–	p26,p58	–	–	2	2	4	U	U
Weser	DE_LW_DENI_19052	Seeburger See	N	N	N	N	–	p21,p26	5	5	–	–	4	2	2
Weser	DE_LW_DENI_12034	Steinhuder Meer	N	N	N	N	–	p9,p21,p22,p26	3	3	–	–	4	4	3
Weser	DE_LW_DENI_14052	Tankumsee	Y	Y	N	N	–	p21,p26,p58,p84	–	–	3	3	4	U	U

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Transitional waters															
Weser	DE_TW_T1.4000.01	Übergangsgewässer der Weser	N	N	Y	Y	e23,e24	p21,p22,p26,p57,p58,p63	3	3	–	–	4	4	3
Coastal waters															
Weser	DE_CW_N0.4000	Küstenmeer Weser	N	N	N	N	–	p26	U	U	–	–	4	1	1
Weser	DE_CW_N1_4900_01	Offenes Küstengewässer vor Jadebusen	N	N	N	N	–	p21,p26	3	3	–	–	4	1	1
Weser	DE_CW_N2_4900_01	Wattenmeer Jadebusen und angrenzende Küstenabschnitte	N	N	N	N	–	p21,p26	3	4	–	–	4	2	1
Weser	DE_CW_N3_4900_01	Offenes Küstengewässer der Weser	N	N	N	N	–	p21,p26	3	4	–	–	4	1	1
Weser	DE_CW_N4_4900_01	Westliches Wattenmeer der Weser	N	N	N	N	–	p21,p26	3	4			4	1	1
Weser	DE_CW_N4_4900_02	Östliches Wattenmeer der Weser	N	N	N	N	–	p21,p26	3	4			4	1	1
Ems river basin															
Flowing waters															
Ems	DE_RW_DENI_06019	Abelitz / Abelitz Moordorfkanal	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_01009	Ahe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03028	Ahlener Sielgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02052	Ahler Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Ems	DE_RW_DENI_02078	Ahrensbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02070	Alfseeauslauf (Durchleiter)	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02057	Alte Hase mit Hochwasserabschlag, Mühlenbach Rüssel	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Ems	DE_RW_DENI_01022	Altenrheiner Bruchgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_03041	Alter Schloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_06025	Altes / Neues Greetsieler Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06017	Altes Tief	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04062	Aper Tief + NG Unterläufe	N	N	Y	Y	e23,e20	p21,p22,p26,p57	–	–	–	4	4	3	2
Ems	DE_RW_DENI_02075	Aubach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U

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Ems	DE_RW_DENI_04053	Aue / Godensholter Tief	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_04041	Aue Mittellauf	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02017	Aue, Bokerner Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Ems	DE_RW_DENI_04059	Auebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04004	Augustfehner Kanal	Y	Y	N	N	–	p21,p22,p26,p57	–	–	–	4	4	3	2
Ems	DE_RW_DENI_06042	Bääkschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_06041	Bagbander Tief mit Bietze	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02023	Bakumer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02021	Bakumer Bach, Schierenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01020	Bardelgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_02003	Belmer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_06009	Benser Tief	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06013	Berumerfehnkanal	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_06010	Bettenwarfer Leide / Neue Dilft	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENW318_0_22	Bever	N	N	Y	Y	e20	p8,p9,p21,p26,p51,p55,p57	–	–	–	4	3	–	2
Ems	DE_RW_DENI_01025	Bever, Süßbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02025	Blocksmühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_02027	Bokeler Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03034	Börger Graben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_04024	Böseler Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_01014	Bramscher Mühlenbach	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_04054	Branneschloot	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_04014	Breinermoorer Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_03027	Brualer Schlot	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_04029	Bruchwasser	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	4	3
Ems	DE_RW_DENI_02065	Bühnerbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U

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Ems	DE_RW_DENI_03008	Bullerbach	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02085	Bünne Wehdeler Grenzkanal mit Handorfer Mühlenbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02030	Bunner-Hamstruper Moorbach	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	2
Ems	DE_RW_DENI_06008	Burgschloot	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_04033	Burlage-Langholter Tief	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	4	3
Ems	DE_RW_DENI_03020	Burwiesenschlot	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_06031	Buschfelder Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02028	Calhorner Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_02029	Calhorner Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Ems	DE_RW_DENI_06029	Coldeborger Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_06035	Coldemüntjer Schöpfwerkstief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03005	Dalumer Moorbeeke	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_03026	Dänenfliess	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01032	Deeper Aa, Andervenner Graben	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_01023	DEK - Grenze NRW bis Gleesen	Y	Y	N	N	–	p13,p21,p26,p57	–	–	–	U	4	U	U
Ems	DE_RW_DENI_03042	DEK Lingen-Meppen	Y	Y	N	N	–	p13,p21,p26,p57	–	–	–	U	4	U	2
Ems	DE_RW_DENI_04017	Delschloot	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03024	Dersumer Schlot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_02086	Diekbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02073	Diekbäke	–	N	–	N	–	p26	–	2	–	–	4	U	U
Ems	DE_RW_DENI_06033	Dieler Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02087	Dinklager Mühlenbach, Harpendorfer Mühlenbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_01024	Dissener Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_06028	Ditzum-Bunder Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02040	Dörgener Beeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_06011	Dornumersieler Tief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Ems	DE_RW_DENI_01029	Dümmer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02093	Düte mit Wilkenbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02060	Eggermühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_02061	Eggermühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Ems	DE_RW_DENI_04064	Ekerner Moorkanal	N	N	Y	Y	e20	p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01010	Elberger Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Ems	DE_RW_DENI_04037	Elisabethfehn-Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01013	Elsbach	N	N	N	N	–	p21,p26,p57	4	4	–	–	4	1	1
Ems	DE_RW_DENI_06054	Emder Hafen	Y	Y	N	N	–	p26,p57	–	–	–	U	4	U	U
Ems	DE_RW_DENI_03018	Emmelner Bach	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_01001	Ems - Salzbergen bis Lingen	N	N	Y	Y	e24,e20	p13,p21,p26,p57	–	–	–	4	4	1	1
Ems	DE_RW_DENI_03001	Ems Lingen-Meppen	N	N	Y	Y	e24,e23,e20	p13,p21,p22,p26,p57	–	–	–	4	4	4	2
Ems	DE_RW_DENI_03002	Ems Meppen-Wehr Herbrum	N	N	Y	Y	e24,e20	p13,p21,p22,p26,p57	–	–	–	4	4	4	2
Ems	DE_RW_DENI_06037	Ems Papenburg bis Leer	N	N	Y	Y	e24,e23,e20	p21,p22,p26,p57	–	–	–	5	4	4	3
Ems	DE_RW_DENI_03003	Ems Wehr Herbrum-Papenburg	N	N	Y	Y	e24,e20	p21,p22,p26,p57	–	–	–	5	4	4	3
Ems	DE_RW_DENI_06040	Ems-Jade-Kanal	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_06058	Ems-Seitenkanal (östl. Teil)	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	1
Ems	DE_RW_DENI_06055	Ems-Seitenkanal / Petkumer Sieltief	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04030	Esterweger Beeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	U	4	U	U
Ems	DE_RW_DENI_04031	Esterweger Doseschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04026	Fanggraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_06052	Fehntjer Tief (südlicher Arm)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06056	Fehntjer Tief (westl. Arm)	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	1
Ems	DE_RW_DENI_04039	Fintlandsmoor-Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_03006	Fischteichableiter	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02071	Fladderkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	2	2

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Ems	DE_RW_DENI_01011	Fleckenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Ems	DE_RW_DENI_06045	Flumm mit Oberlauf und Alter Flumm	N	N	Y	Y	e20	p22,p26,p57	–	–	–	4	4	3	1
Ems	DE_RW_DENI_04048	Friesoyther Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_01033	Fürstenauer Mühlbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_01018	Giegel Aa	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_04008	Gießelhorster Bäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01027	Glaner Bach, Oedingberger Bach, Wispenbach, Kolbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02068	Gohmarschgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Ems	DE_RW_DENI_03009	Goldbach	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_02094	Goldbach und Leedener Mühlbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03029	Goldfischdever	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_04010	Gr. Norderbäke Mittellauf	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	5	4	3	2
Ems	DE_RW_DENI_04009	Gr. Norderbäke Oberlauf	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	2
Ems	DE_RW_DENI_04040	Gr. Süderbäke Mittellauf	N	N	Y	Y	e23,e20	p21,p22,p26,p57	–	–	–	5	4	3	2
Ems	DE_RW_DENI_04006	Gr. Süderbäke Oberl. + Kl. Norderbäke	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	2
Ems	DE_RW_DENI_03015	Gräfte	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	1
Ems	DE_RW_DENI_01003	Grosse Aa - bis Einmündung Speller Aa	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_01002	Grosse Aa - Einmündung Speller Aa bis Ems	N	N	Y	Y	e20	p13,p21,p26,p57	–	–	–	5	4	2	2
Ems	DE_RW_DENI_04021	Große Aue + Bergaue	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06044	Großefehnkanal	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_03036	Großer Schloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06030	Großsoltborger Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02054	Grother Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02053	Grother Kanal, Langenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_03035	Haardever	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02064	Hahnenmoorkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	2	2

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Ems	DE_RW_DENI_03007	Hakengraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_04060	Halfsteder Bäke + NG	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_03031	Hammoorgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	2
Ems	DE_RW_DENI_03044	Haren-Rütenbrock-Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06005	Harle / Abenser Leide	N	N	Y	Y	–	p21,p22,p26,p57	–	–	–	4	4	4	2
Ems	DE_RW_DENI_02008	Hase Mittellauf bis Mittellandkanal	N	N	Y	Y	–	p21,p22,p26,p57	–	–	–	4	4	3	2
Ems	DE_RW_DENI_02089	Hase, Große Hase	–	N	–	Y	e20	p21,p22,p26,p57	–	–	–	3	4	3	2
Ems	DE_RW_DENI_02090	Hase, Mittellauf Typ 15	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_02046	Hase-Altarm, Bawinkler Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_04012	Hauenschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_03025	Hauptmarschschlot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04013	Heimschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_02083	Heller Binnenbach mit Kronlager MB	–	N	–	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_06021	Hiwkeschloot	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_04007	Hollener Ehe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_04016	Holter Sieltief	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04034	Holterfehnkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04011	Holtlander Ehe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_01021	Hopstener Aa	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENW344_20_29	Hopstener Aa	N	N	Y	Y	e20,e23	p9,p21,p26,p55,p57	–	–	–	4	3	–	2
Ems	DE_RW_DENI_04043	Igelriede	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02045	Kleine Beeke	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02062	Kleine Hase	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_06023	Knockster Tief Mittellauf	Y	Y	N	N	–	p22,p26,p57	–	–	–	5	4	3	1
Ems	DE_RW_DENI_06024	Knockster Tief Unterlauf	Y	Y	N	N	–	p21,p22,p26,p57	–	–	–	5	4	3	1
Ems	DE_RW_DENI_02076	Königsbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	5	4	U	U

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Ems	DE_RW_DENI_06046	Krummes Tief	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Ems	DE_RW_DENI_03045	Küstenkanal Ems-Börgermoor	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Ems	DE_RW_DENI_04019	Küstenkanal westl. Vehnedüker	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Ems	DE_RW_DENI_02009	Laake	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Ems	DE_RW_DENI_02049	Lager Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02072	Lager Bach, Welle	–	N	–	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_02022	Lager Hase	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_04023	Lahe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_04050	Lahe Unterlauf + Streek	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02042	Lahner Graben	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_03019	Landegger Schloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_06026	Larrelter Tief	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	1
Ems	DE_RW_DENI_03021	Lathener Beeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_04035	Leda + Sagter Ems	N	N	Y	Y	e24,e23,e20	p21,p22,p26,p57	–	–	–	4	4	4	3
Ems	DE_RW_DENI_06039	Leda Sperrwerk bis Emsmündung	N	N	Y	Y	e24,e23,e20	p22,p26,p57	–	–	–	5	4	4	4
Ems	DE_RW_DENI_03004	Lingener Mühlenbach	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02055	Linksseitiger Grundabzug	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	2	2
Ems	DE_RW_DENI_01012	Listruper Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	1	1
Ems	DE_RW_DENI_04038	Loher Ostmarkkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02031	Löninger Mühlenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Ems	DE_RW_DENI_04066	Loruper Beeke	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02047	Lotter Beeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_01017	Lünner Graben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_04061	Marka	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06036	Marker Sieltief / Wallschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04018	Markhauser Moorgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U

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Ems	DE_RW_DENI_03022	Melstruper Beeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_03011	Mersbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Ems	DE_RW_DENI_02020	Minteweder Bach, Schierenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02012	Mittellandkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Ems	DE_RW_DENI_02037	Mittelradde	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02038	Mittelradde	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Ems	DE_RW_DENI_04044	Molberger Doosekanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02032	Moldau	N	N	Y	Y	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02082	Möllwiesenbach	–	N	–	Y	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03032	Montaniagraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02050	Moorabzug III	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_01019	Moosbeeke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_06034	Muhder Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02026	Nadamer Bach	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_02004	Nette, Lechtinger Bach	N	N	Y	Y	e26,e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_06007	Neuharlinger Sieltief	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02077	Nonnenbach mit Quebbebach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_06014	Norder Tief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_04005	Nordgeorgsfehnkanal + Riesmeerschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04056	Nordgeorgsfehnkanal + Südgeorgsfehnkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_03014	Nordradde bis Stavern	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	1
Ems	DE_RW_DENI_03012	Nordradde in Meppen	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	1
Ems	DE_RW_DENI_03013	Nordradde Stavern-Gut Cunzhof	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	3	4	3	1
Ems	DE_RW_DENI_04051	Nortmoorer Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_06012	Nüttermoorer Sieltief Oberlauf	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06050	Nüttermoorer Sieltief Unterlauf	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Ems	DE_RW_DENI_02063	Oberer Stockshagenbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_01007	Oberlauf - Fürstenauer Mühlenbach	N	N	Y	Y	e20,e22	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_02074	Oberlauf Hase mit Flöthegraben	–	N	–	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	2
Ems	DE_RW_DENI_04065	Ohe	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_04028	Ohe Unterlauf/Marka	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_06047	Oldersumer Sieltief / Fehntjer Tief	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	1
Ems	DE_RW_DENI_04057	Ollenbäke Mittellauf	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	4	4	3	2
Ems	DE_RW_DENI_04058	Ollenbäke Oberlauf	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	5	4	3	2
Ems	DE_RW_DENI_04036	Ostermoorgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Ems	DE_RW_DENI_04003	Otter- u. Hellerbäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03039	Papenburger Kanäle	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02079	Pielkebach	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_04052	Pieper Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_01026	Rankenbach, Remseder Bach, Linksseitiger Talgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_01028	Recktebach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_01008	Reetbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_01016	Reitbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Ems	DE_RW_DENI_02058	Reitbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_02059	Reitbach	N	N	N	N	–	p26	2	2	–	–	4	2	2
Ems	DE_RW_DENI_02051	Renslager Kanal, Strautbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_06048	Ridding	N	N	Y	Y	e23,e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02039	Riehe	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06015	Ringkanal	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04027	Rittveengraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_06053	Rorichumer Tief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	1
Ems	DE_RW_DENI_02005	Rosenmühlenbach	N	N	Y	Y	e26,e20	p21,p26,p57	–	–	–	5	4	U	2

RBU	EU Code/WB No.	WB name	AWB 08	AWB 13	HMWB 08	HMWB 13	Reason	Contamination	ES 08	ES 14	EP 08	EP 14	CS 14 with Hg	CS 14 without Hg	CS 14 without ubi. Substances
Ems	DE_RW_DENI_03040	Rühlermoorschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06016	Sandhorster Ehe (Oberlauf)	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06059	Sandhorster Ehe (Unterlauf)	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06049	Sauteler Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01005	Schaler Aa	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_04015	Schatteburger Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01015	Schinkenkanal	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Ems	DE_RW_DENI_02069	Seester Bruchgraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03030	Seitenkanal Gleesen-Papenburg	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	2
Ems	DE_RW_DENI_04047	Soeste ab TT bis Küstenkanal	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	3	4	3	2
Ems	DE_RW_DENI_04046	Soeste Mittellauf bis TT	N	N	Y	N	–	p8,p21,p26,p57	–	4	5	–	4	U	U
Ems	DE_RW_DENI_04045	Soeste Oberlauf	Y	N	N	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04042	Soeste, Nordloher-Barsseler Tief + Jümme	N	N	Y	Y	e23,e20	p21,p22,p26,p57	–	–	–	5	4	4	2
Ems	DE_RW_DENI_03016	Sögeler Grenzgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_06004	Speicherbecken Leybucht	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01004	Speller Aa	N	N	Y	Y	e20	p13,p21,p26,p57	–	–	–	5	4	2	2
Ems	DE_RW_DENI_06043	Spetzerfehnkanal	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02019	Spredaer Bach, Vechtaer Moorbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Ems	DE_RW_DENI_04055	Stapeler Hauptvorfluter	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_06032	Stapelmoorer Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02024	Steinbäke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02010	Stichkanal Osnabrück, Mittellandkanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	U	4	U	U
Ems	DE_RW_DENI_04049	Streek	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_06006	Süder Tief und Norder Tief	N	N	Y	Y	e20	p21,p22,p26,p57	–	–	–	5	4	4	2
Ems	DE_RW_DENI_03043	Süd-Nord-Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02033	Südradde	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2

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Ems	DE_RW_DENI_02034	Südradde	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Ems	DE_RW_DENI_02036	Südradde	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02041	Südradde	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	2
Ems	DE_RW_DENI_02056	Suttruper Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_02044	Teglinger Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_06051	Terborger Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02092	Thiener Mühlenbach	–	N	–	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_02035	Timmerlager Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_06022	Trecktief / Westerender Ehe	Y	Y	N	N	–	p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02088	Trenskampbach mit Harpendorfer MB und Mühlener MB	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03037	Tunxdorfer Ahe Aschendorf - Tunxdorf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_03038	Tunxdorfer Ahe Tunxdorf - Schöpfwerk Oberlauf	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02091	Ueffelner Aue	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Ems	DE_RW_DENI_06057	Vaskemeerzugschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02018	Vechtaer Moorbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	2	2
Ems	DE_RW_DENI_04022	Vehne Mittellauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_04063	Vehne Unterlauf	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02043	Vinner Dorfgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01030	Voltlager Aa	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	U
Ems	DE_RW_DENI_02080	Vördener Aue mit Flöte	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_03023	Walchumer Schlot	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_04020	Wasserzug vom Baumweg	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_01031	Weeser Aa	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06018	Westerender Ehe Oberlauf	N	N	Y	Y	e20	p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_04032	Westrhauderfehnkanal-Rajenwieke	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_03017	Wesuwer Brookgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2

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Ems	DE_RW_DENI_03010	Wesuwer Schloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	2
Ems	DE_RW_DENI_06020	Wiegboldsburer Riede / Marscher Tief / Knockster	Y	Y	N	N	–	p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02002	Wierau, Hiddinghauser Bach, Westermoorbach	N	N	Y	Y	e26,e20	p21,p26,p57	–	–	–	3	4	U	2
Ems	DE_RW_DENI_03033	Wippinger Dever	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_02081	Wrau	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	2
Ems	DE_RW_DENI_02084	Wrau Alte Hase	–	N	–	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Ems	DE_RW_DENI_06027	Wymeerer Sieltief	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Ems	DE_RW_DENI_02066	Zuleiter Alfsee	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Standing waters															
Ems	DE_LW_DENI_02001	Alfsee	Y	Y	N	N	–	p21,p26,p58	–	–	3	3	4	2	2
Ems	DE_LW_DENI_06001	Ewiges Meer	N	N	N	N	–	p26	2	2	–	–	4	U	U
Ems	DE_LW_DENI_06002	Großes Meer	N	N	N	N	–	p21,p26	4	4	–	–	4	U	U
Ems	DE_LW_DENI_06003	Hieve	N	N	Y	N	–	p21,p26	–	3	3	–	4	U	U
Ems	DE_LW_DENI_04002	Thülsfelder Talsperre	N	N	Y	Y	e23	p21,p26,p49	–	–	4	4	4	U	U
Ems	DE_LW_DENI_04001	Zwischenahner Meer	N	N	Y	N	–	p21,p22,p26	–	4	4	–	4	3	1
Transitional waters															
Ems	DE_TW_T1.3000.01	Übergangsgewässer Ems (Leer bis Dollart)	N	N	Y	Y	e23,e24	p21,p22,p26,p57,p58,p63	–	–	5	4	4	4	4
Ems	DE_TW_T1.3990.01	Übergangsgewässer Ems-Ästuar	N	N	Y	Y	e23,e24	p21,p22,p26,p57,p58,p63	–	–	3	3	4	4	3
Coastal waters															
Ems	DE_CW_N0.3900	Küstenmeer Ems	N	N	N	N	–	p22,p26	U	U	–	–	4	4	2
Ems	DE_CW_N0.3990	Küstenmeer Ems-Ästuar	N	N	N	N	–	p22,p26	U	U	–	–	4	4	2
Ems	DE_CW_N1_3100_01	Euhalines offenes Küstengewässer der Ems	N	N	N	N	–	p21,p22,p26	3	4	–	–	4	4	2
Ems	DE_CW_N2_3100_01	Euhalines Wattenmeer der Ems	N	N	N	N	–	p21,p22,p26	4	4	–	–	4	4	2
Ems	DE_CW_N3_3990_01	Polyhalines offenes Küstengewässer des Emsästuars	N	N	N	N	–	p21,p22,p26	3	3	–	–	4	4	2
Ems	DE_CW_N4_3100_01	Polyhalines Wattenmeer der Ems	N	N	N	N	–	p21,p22,p26	3	3	–	–	4	4	2

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Rhine river basin															
Flowing waters															
Rhein	DE_RW_DENI_32007	Ahlder Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Rhein	DE_RW_DENI_32021	Böltbach	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	1	1
Rhein	DE_RW_DENI_32009	Brandlechter Bruchgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	1
Rhein	DE_RW_DENI_32039	Coevorden-Piccardie-Kanal	Y	Y	N	N	–	p13,p21,p26,p57	–	–	–	3	4	U	U
Rhein	DE_RW_DENI_32004	Dinkel	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Rhein	DE_RW_DENI_32005	Eileringsbecke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Rhein	DE_RW_DENI_32037	Emlichheimer Entlastungskanal	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	1
Rhein	DE_RW_DENI_32036	Emlichheimer Graben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Rhein	DE_RW_DENI_32042	Ems-Vechte-Kanal	Y	Y	N	N	–	p13,p21,p26,p57	–	–	–	4	4	U	U
Rhein	DE_RW_DENI_32008	Engdener Bach	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	1
Rhein	DE_RW_DENI_32010	Frensdorfer Bruchgraben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	U
Rhein	DE_RW_DENI_32038	Georgsdorfer Graben A	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Rhein	DE_RW_DENI_32045	Geteloer Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	U	4	U	U
Rhein	DE_RW_DENI_32033	Grenzaa bis Ringe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Rhein	DE_RW_DENI_32034	Grenzaa Ringe-CPK	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Rhein	DE_RW_DENI_32013	Hardinger Becke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Rhein	DE_RW_DENI_32023	Hauptbecke Bimolten	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	1	1
Rhein	DE_RW_DENI_32032	Hauptvorfluter Heesterkante	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Rhein	DE_RW_DENI_32030	Hopfenbach	N	N	N	N	–	p21,p26,p57	2	4	–	–	4	U	U
Rhein	DE_RW_DENI_32044	Itter	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Rhein	DE_RW_DENI_32043	Jaggerschloot	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Rhein	DE_RW_DENI_32017	Lee bis Hohenkörben	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	1	1
Rhein	DE_RW_DENI_32016	Lee Hohenkörben-Vechte	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1

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Rhein	DE_RW_DENI_32024	Leegraben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	1
Rhein	DE_RW_DENI_32018	Lohner Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Rhein	DE_RW_DENI_32022	Neuenhauser Kanal	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	1	1
Rhein	DE_RW_DENI_32012	Nordbecks Graben	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	2	2
Rhein	DE_RW_DENI_32041	Nordhorn-Almelo-Kanal	Y	Y	N	N	–	p21,p26,p57	–	–	–	5	4	U	U
Rhein	DE_RW_DENI_32015	Obere Lee	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	1	1
Rhein	DE_RW_DENI_32026	Puntbecke	Y	Y	N	N	–	p21,p26,p57	–	–	–	3	4	U	U
Rhein	DE_RW_DENI_32031	Radewijke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Rhein	DE_RW_DENI_32027	Rammelbecke ab Forst Bentheim	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Rhein	DE_RW_DENI_32028	Rammelbecke Forst Bentheim	N	N	N	N	–	p21,p26,p57	4	3	–	–	4	U	U
Rhein	DE_RW_DENI_32025	Ravenhorster Bach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	U	U
Rhein	DE_RW_DENI_32011	Rietbecke	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	2	2
Rhein	DE_RW_DENI_32006	Samerottbecke	Y	Y	N	N	–	p21,p26,p57	–	–	–	4	4	U	1
Rhein	DE_RW_DENI_32020	Soermannsbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	4	4	1	1
Rhein	DE_RW_DENI_32019	Stiftsbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Rhein	DE_RW_DENI_32040	Süd-Nord-Kanal	Y	Y	N	N	–	p13,p21,p26,p57	–	–	–	4	4	U	U
Rhein	DE_RW_DENI_32003	Vechte Neuenhaus-Laar	N	N	Y	Y	e21	p21,p22,p26,p57	–	–	–	3	4	3	1
Rhein	DE_RW_DENI_32002	Vechte Nordhorn-Neuenhaus	N	N	Y	Y	e21	p21,p22,p26,p57	–	–	–	3	4	4	1
Rhein	DE_RW_DENI_32001	Vechte Ohne-Nordhorn	N	N	Y	Y	e21	p21,p22,p26,p57	–	–	–	3	4	4	1
Rhein	DE_RW_DENI_32035	Wettringe	N	N	Y	Y	e20	p21,p26,p57	–	–	–	5	4	U	U
Rhein	DE_RW_DENI_32014	Wolsterbach	N	N	Y	Y	e20	p21,p26,p57	–	–	–	3	4	U	1

An extension of deadline to achieve the management objectives is claimed for all surface waters that fall short of the ecological management objectives. Since all surface waters fall short of good chemical status, a deadline extension is also notified for the chemical dimension of all surface waters (cf. Chapter 5.3.1).
In view of the cadmium contamination of the waters in the Harz and Harz foothills which originates from the former mining activities, divergent management objectives are laid down for a number of water bodies (cf. Chapter 5.3.1). These waters are listed in the following table.

Table 97: Determination of divergent management objectives for surface water bodies

RBU	EU Code/WB No.	WB name	Divergent management objectives Chemical status	
			Lack of technical feasibility	Unreasonably high cost
Weser	DE_RW_DENI_15003	Abzucht	Ja	Nein
Weser	DE_RW_DENI_20016	Alme	Ja	Nein
Weser	DE_RW_DENI_20017	Alpebach	Ja	Nein
Weser	DE_RW_DENI_15026	Altenau	Ja	Nein
Weser	DE_RW_DENI_15028	Altenau	Ja	Nein
Weser	DE_RW_DENI_20009	Beuster	Ja	Nein
Weser	DE_RW_DENI_15038	Bickgraben	Ja	Nein
Weser	DE_RW_DENI_20002	Großer Graben	Ja	Nein
Weser	DE_RW_DENI_15032	Brückenbach	Ja	Nein
Weser	DE_RW_DENI_20013	Büntebach	Ja	Nein
Weser	DE_RW_DENI_20006	Dingelber Klunkau	Ja	Nein
Weser	DE_RW_DENI_20004	Dinklarer Klunkau	Ja	Nein
Weser	DE_RW_DENI_20005	Dinklarer Klunkau	Ja	Nein
Weser	DE_RW_DENI_15011	Ecker	Ja	Nein

RBU	EU Code/WB No.	WB name	Divergent management objectives Chemical status	
			Lack of technical feasibility	Unreasonably high cost
Weser	DE_RW_DENI_15007	Ecker	Ja	Nein
Weser	DE_RW_DENI_15009	Eckergraben	Ja	Nein
Weser	DE_RW_DENI_15015	Eckergraben	Ja	Nein
Weser	DE_RW_DENI_20007	Flußgraben	Ja	Nein
Weser	DE_RW_DENI_15034	Fuhsekanal	Ja	Nein
Weser	DE_RW_DENI_15029	Ahlumer Bach	Ja	Nein
Weser	DE_RW_DENI_15025	Alte Ilse	Ja	Nein
Weser	DE_RW_DENI_20037	Grane	Ja	Nein
Weser	DE_RW_DENI_15030	Hachumerbach	Ja	Nein
Weser	DE_RW_DENI_15017	Hasenbeeke	Ja	Nein
Weser	DE_RW_DENI_20029	Hengstebach	Ja	Nein
Weser	DE_RW_DENI_20001	Innerste	Ja	Nein
Weser	DE_RW_DENI_20039	Innerste	Ja	Nein
Weser	DE_RW_DENI_20045	Innerste	Ja	Nein
Weser	DE_RW_DENI_20046	Innerste	Ja	Nein
Weser	DE_RW_DENI_20034	Jerstedter Bach	Ja	Nein
Weser	DE_RW_DENI_20011	Kalte Beuster	Ja	Nein
Weser	DE_RW_DENI_15022	Krummbach	Ja	Nein
Weser	DE_RW_DENI_20008	Kupferstrang	Ja	Nein
Weser	DE_RW_DENI_20044	Lake-Bach	Ja	Nein

RBU	EU Code/WB No.	WB name	Divergent management objectives Chemical status	
			Lack of technical feasibility	Unreasonably high cost
Weser	DE_RW_DENI_20012	Lamme	Ja	Nein
Weser	DE_RW_DENI_20015	Lamme	Ja	Nein
Weser	DE_RW_DENI_15005	Lange	Ja	Nein
Weser	DE_RW_DENI_15019	Schiffgraben-West	Ja	Nein
Weser	DE_RW_DENI_20030	Neile	Ja	Nein
Weser	DE_RW_DENI_20032	Neile	Ja	Nein
Weser	DE_RW_DENI_20028	Oelber-Bach	Ja	Nein
Weser	DE_RW_DENI_15013	Ohebach	Ja	Nein
Weser	DE_RW_DENI_15001	Oker	Ja	Nein
Weser	DE_RW_DENI_15002	Oker	Ja	Nein
Weser	DE_RW_DENI_15036	Oker	Ja	Nein
Weser	DE_RW_DENI_15006	Radau	Ja	Nein
Weser	DE_RW_DENI_20014	Riehe	Ja	Nein
Weser	DE_RW_DENI_15027	Rothebach	Ja	Nein
Weser	DE_RW_DENI_15031	Sauerbach	Ja	Nein
Weser	DE_RW_DENI_15012	Schamlahbach	Ja	Nein
Weser	DE_RW_DENI_15018	Schiffgraben-West	Ja	Nein
Weser	DE_RW_DENI_20031	Steimker Bach	Ja	Nein
Weser	DE_RW_DENI_15023	Stobenbergbach	Ja	Nein
Weser	DE_RW_DENI_15033	Thiedebach	Ja	Nein

RBU	EU Code/WB No.	WB name	Divergent management objectives Chemical status	
			Lack of technical feasibility	Unreasonably high cost
Weser	DE_RW_DENI_20035	Töllebach	Ja	Nein
Weser	DE_RW_DENI_20003	Unsinnbach	Ja	Nein
Weser	DE_RW_DENI_20010	Warme Beuster	Ja	Nein
Weser	DE_RW_DENI_15021	Warne	Ja	Nein
Weser	DE_RW_DENI_15024	Warne	Ja	Nein
Weser	DE_RW_DENI_15014	Weddebach	Ja	Nein
Weser	DE_RW_DENI_15016	Zieselbach	Ja	Nein

Appendix B – Groundwater

Appendix B-1: Overview of abstraction

Table 98: Overview of abstraction from groundwater bodies located wholly or partially in Lower Saxony (Note: Database: 12.03.2013 Data source: Water register)

EU Code/WB No.	WB name	Approved abstraction quantities [m³/a]	Groundwater recharge [m3/a]	Percentage of approved abstraction quantities [%]	Number of water rights
DE_GB_DEHE_4_0023	4190_5117	83,000	2,192,449	3.8	4
DE_GB_DEHE_4_0024	4190_5201	380,500	4,053,832	9.4	12
DE_GB_DEHE_4_1043	4290_5201	3,186,550	7,399,891	43.1	13
DE_GB_DEHE_4_2304	4300.1_5201	0	169,589	0	
DE_GB_DENI_39_04	Baltrum	40,000	885,089	4.5	1
DE_GB_DENI_928_25	Bentheimer Berg	718,000	6,980,391	10.3	2
DE_GB_DENI_4_2202	Böhme Lockergestein links	7,562,533	66,893,726	11.3	60
DE_GB_DENI_4_2201	Böhme Lockergestein rechts	28,023,287	144,324,310	19.4	91
DE_GB_DENI_39_01	Borkum	1,203,650	3,954,447	30.4	2
DE_GB_DETH_4_2012	Eichsfelder Buntsandsteinscholle-Leine	2,000	258,484	0.8	1
DE_GB_DENI_NI11_3	Este-Seeve Lockergestein	66,493,284	185,782,798	35.8	159
DE_GB_DENI_4_2115	Fuhse Lockergestein rechts	22,973,222	69,244,479	33.2	197
DE_GB_DENI_4_2114	Fuhse mesozoisches Festgestein rechts	4,555,440	20,517,044	22.2	10
DE_GB_DENI_928_28	Grenzaa	1,144,000	13,221,107	8.7	2
DE_GB_DENI_3_03	Große Aa	7,150,154	85,735,250	8.3	28
DE_GB_DENW_4_2408	Große Aue Lockergestein im Süden	0	139,236	0	
DE_GB_DENI_4_2413	Große Aue Lockergestein links	24,800,864	94,031,611	26.4	100
DE_GB_DENI_4_2412	Große Aue Lockergestein rechts	3,863,428	52,228,195	7.4	106
DE_GB_DENI_36_03	Hase links Festgestein	13,582,385	39,177,479	34.7	77
DE_GB_DENI_36_01	Hase links Lockergestein	23,764,444	175,280,163	13.6	88

EU Code/WB No.	WB name	Approved abstraction quantities [m³/a]	Groundwater recharge [m3/a]	Percentage of approved abstraction quantities [%]	Number of water rights
DE_GB_DENI_36_05	Hase Lockergestein rechts	35,898,317	297,966,773	12	323
DE_GB_DENI_36_02	Hase rechts Festgestein	16,256,550	45,697,456	35.6	63
DE_GB_DENW_4_2308	Höxteraner Trias	146,000	1,064,610	13.7	1
DE_GB_DENI_4_2504	Hunte Festgestein links	1,316,750	9,425,565	14	5
DE_GB_DENI_4_2503	Hunte Festgestein rechts	518,000	2,225,094	23.3	2
DE_GB_DENI_4_2505	Hunte Lockergestein links	41,871,583	184,954,550	22.6	230
DE_GB_DENI_4_2502	Hunte Lockergestein rechts	41,458,973	194,905,897	21.3	280
DE_GB_DENI_NI11_2	Ilmenau Lockergestein links	50,957,470	273,827,348	18.6	731
DE_GB_DENI_NI11_1	Ilmenau Lockergestein rechts	45,525,192	199,213,760	22.9	592
DE_GB_DENI_4_2004	Innerste Harzpaläozoikum	606,000	44,631,324	1.4	14
DE_GB_DENI_4_2005	Innerste mesozoisches Festgestein links	19,846,905	90,593,434	21.9	94
DE_GB_DENI_4_2003	Innerste mesozoisches Festgestein rechts	4,546,890	60,222,360	7.6	40
DE_GB_DENI_4_2104	Ise Lockergestein links	40,263,954	64,317,099	62.6	84
DE_GB_DENI_4_2103	Ise Lockergestein rechts	8,748,000	28,772,954	30.4	24
DE_GB_DENI_928_27	Itter	8,089,000	18,948,201	42.7	3
DE_GB_DENI_4_2507	Jade Lockergestein links	52,795,107	120,035,965	44	70
DE_GB_DENI_NI10_5	Jeetzel Lockergestein links	17,959,565	69,304,921	25.9	241
DE_GB_DENI_NI10_1	Jeetzel Lockergestein rechts	6,294,757	35,879,172	17.5	85
DE_GB_DENI_39_02	Juist	415,000	1,516,000	27.4	2
DE_GB_DENW_4_2410	Kreide-Schichten zwischen Stemwede und Petershagen	12,000	3,397,773	0.4	1
DE_GB_DENI_NI11_8	Land Hadeln Lockergestein	14,176,120	80,565,841	17.6	24
DE_GB_DENI_NI11_5	Land Kehdingen Lockergestein	327,828	9,135,992	3.6	22
DE_GB_DENI_39_05	Langeoog	983,043	2,881,915	34.1	7
DE_GB_DENI_38_01	Leda-Jümme Lockergestein links	58,639,420	152,140,317	38.5	57
DE_GB_DENI_38_02	Leda-Jümme Lockergestein rechts	36,494,599	192,986,058	18.9	333
DE_GB_DENI_4_2016	Leine Lockergestein links	32,970,024	72,534,420	45.5	117

EU Code/WB No.	WB name	Approved abstraction quantities [m³/a]	Groundwater recharge [m3/a]	Percentage of approved abstraction quantities [%]	Number of water rights
DE_GB_DENI_4_2001	Leine Lockergestein rechts	22,179,314	62,380,423	35.6	84
DE_GB_DENI_4_2014	Leine mesozoisches Festgestein links 1	12,064,648	120,137,139	10	58
DE_GB_DENI_4_2015	Leine mesozoisches Festgestein links 2	19,491,348	143,959,618	13.5	132
DE_GB_DENI_4_2013	Leine mesozoisches Festgestein rechts 1	9,005,591	34,314,145	26.2	41
DE_GB_DENI_4_2007	Leine mesozoisches Festgestein rechts 2	2,580,536	43,721,603	5.9	28
DE_GB_DENI_4_2006	Leine mesozoisches Festgestein rechts 3	10,358,252	31,190,297	33.2	46
DE_GB_DENI_4_2002	Leine mesozoisches Festgestein rechts 4	4,101,200	11,019,683	37.2	46
DE_GB_DENI_NI11_4	Lühe-Schwinge Lockergestein	13,412,968	86,371,646	15.5	109
DE_GB_DEMV_MEL_SU_3	MEL_SU_3	0	1,440,412	0	
DE_GB_DEMV_MEL_SU_4	MEL_SU_4	688,050	11,792,640	5.8	8
DE_GB_DEST_MBA 4	Milde-Biese-Aland4	0	33,470	0	
DE_GB_DENI_37_01	Mittlere Ems Lockergestein links	11,742,500	106,631,768	11	37
DE_GB_DENI_37_02	Mittlere Ems Lockergestein rechts 1	17,929,085	24,062,662	74.5	32
DE_GB_DENI_37_03	Mittlere Ems Lockergestein rechts 2	12,156,250	137,727,785	8.8	23
DE_GB_DENI_4_2404	Mittlere Weser Festgestein rechts	2,615,483	42,035,818	6.2	35
DE_GB_DENI_4_2411	Mittlere Weser Lockergestein links 2	1,067,267	13,928,659	7.7	18
DE_GB_DENI_4_2414	Mittlere Weser Lockergestein links 3	6,414,429	65,833,174	9.7	117
DE_GB_DENI_4_2403	Mittlere Weser Lockergestein rechts	25,401,008	60,234,701	42.2	127
DE_GB_DENW_928_06	Niederung der Dinkel	0	20,210,562	0	
DE_GB_DENW_3_05	Niederung der Oberen Ems (Greven/Ladbergen)	854,740	6,517,337	13.1	14
DE_GB_DENW_3_06	Niederung der Oberen Ems (Sassenberg/Versmold)	9,220,550	25,115,945	36.7	25
DE_GB_DENW_928_07_1	Niederung der Vechte	0	5,932,026	0	1
DE_GB_DENI_928_24	Niederung der Vechte links	930,000	14,527,909	6.4	2
DE_GB_DENI_928_23	Niederung der Vechte rechts	10,713,700	82,271,411	13	8
DE_GB_DENW_4_2407	Niederung der Weser	0	223,730	0	
DE_GB_DENI_39_08	Norderland/Harlinger Land	19,511,128	95,678,052	20.4	36

EU Code/WB No.	WB name	Approved abstraction quantities [m³/a]	Groundwater recharge [m3/a]	Percentage of approved abstraction quantities [%]	Number of water rights
DE_GB_DENI_39_03	Norderney	2,620,000	4,073,344	64.3	3
DE_GB_DENW_4_2320	Nördliche Herforder Mulde	0	2,112,583	0	
DE_GB_DENW_4_2312	Nordlippische Trias-Gebiete	7,064,050	24,294,752	29.1	38
DE_GB_DENI_4_2110	Obere Aller Lockergestein links	7,233,212	30,689,730	23.6	71
DE_GB_DENI_4_2106	Obere Aller mesozoisches Festgestein links	2,794,530	26,695,466	10.5	94
DE_GB_DENI_3_01	Obere Ems links (Plantlünner Sandebene West)	376,500	14,859,395	2.5	12
DE_GB_DENI_4_2302	Oberweser-Hameln	34,536,678	48,772,193	70.8	105
DE_GB_DENW_928_10	Ochtruper Sattel	0	485,864	0	
DE_GB_DENI_4_2510	Ochtum Lockergestein	34,583,112	152,462,112	22.7	130
DE_GB_DEST_OT 1	Ohre-Tanger1	10,708,800	16,731,191	64	9
DE_GB_DENI_4_2108	Oker Harzpaläozoikum	6,005,813	41,054,417	14.6	19
DE_GB_DENI_4_2111	Oker Lockergestein links	2,939,400	8,668,728	33.9	12
DE_GB_DENI_4_2112	Oker Lockergestein rechts	11,562,060	15,552,164	74.3	16
DE_GB_DENI_4_2109	Oker mesozoisches Festgestein links	5,750,050	31,100,232	18.5	30
DE_GB_DENI_4_2107	Oker mesozoisches Festgestein rechts	75,025,364	88,023,403	85.2	92
DE_GB_DENI_4_2102	Örtze Lockergestein links	72,813,102	235,513,577	30.9	106
DE_GB_DENI_4_2101	Örtze Lockergestein rechts	17,824,617	139,266,698	12.8	60
DE_GB_DENI_NI11_7	Oste Lockergestein links	13,621,620	125,005,816	10.9	52
DE_GB_DENI_NI11_6	Oste Lockergestein rechts	17,485,944	150,817,524	11.6	52
DE_GB_DENW_4_2314	Östlicher Teutoburger Wald	0	321,403	0	
DE_GB_DENI_4_2309	Ottensteiner Hochfläche	4,163,922	23,375,270	17.8	23
DE_GB_DENW_4_2409	Petershäger Kreide	0	3,248	0	
DE_GB_DENW_3_02	Plantlünner Sandebene (Mitte)	45,200	19,432,855	0.2	4
DE_GB_DENI_4_2008	Rhume Harzpaläozoikum	1,581,890	69,591,790	2.3	11
DE_GB_DENI_4_2010	Rhume mesozoisches Festgestein links	2,554,296	25,239,684	10.1	31
DE_GB_DENI_4_2009	Rhume mesozoisches Festgestein rechts	11,078,660	50,698,048	21.9	37

EU Code/WB No.	WB name	Approved abstraction quantities [m³/a]	Groundwater recharge [m3/a]	Percentage of approved abstraction quantities [%]	Number of water rights
DE_GB_DETH_SAL GW 037	SAL GW 037	0	274,730	0	
DE_GB_DEST_SAL GW 038	SAL GW 038	18,000	4,673,819	0.4	1
DE_GB_DEST_SAL GW 039	SAL GW 039	2,224,580	18,446,072	12.1	12
DE_GB_DEST_SAL GW 064	SAL GW 064	778,500	9,318,909	8.4	9
DE_GB_DEST_SAL GW 066	SAL GW 066	12,613,900	16,271,401	77.5	22
DE_GB_DENI_39_06	Spiekeroog	172,400	2,338,540	7.4	3
DE_GB_DENW_4_2317	Südliche Herforder Mulde	96,600	15,843,606	0.6	4
DE_GB_DENW_4_2310	Südlippische Trias-Gebiete	5,311,416	17,094,704	31.1	28
DE_GB_DENW_4_2301	Talaue der Weser südl. Wiehengebirge	5,105,400	3,798,472	134.4	14
DE_GB_DENI_36_04	Teutoburger Wald - Hase	527,600	3,593,444	14.7	5
DE_GB_DENW_3_15	Teutoburger Wald (Nordwest)	2,258,550	7,904,334	28.6	8
DE_GB_DENI_4_2203	Untere Aller Lockergestein links	20,442,410	62,965,194	32.5	144
DE_GB_DENI_39_10	Untere Ems Lockergestein links	2,550,000	14,878,668	17.1	2
DE_GB_DENI_39_09	Untere Ems rechts	34,488,000	128,364,012	26.9	16
DE_GB_DENI_928_26	Untere Vechte links	513,600	28,666,679	1.8	2
DE_GB_DENI_4_2506	Untere Weser Lockergestein links	0	24,749,494	0	
DE_GB_DENI_4_2501	Untere Weser Lockergestein rechts	40,931,100	208,174,635	19.7	86
DE_GB_DENI_4_2303	Vogler-Solling-Bramwald	25,312,042	107,353,617	23.6	112
DE_GB_DENI_39_07	Wangerooge	0	950,281	0	
DE_GB_DENI_4_2318	Werre mesozoisches Festgestein	2,697,994	10,536,750	25.6	14
DE_GB_DENI_4_2113	Wietze/Fuhse Festgestein	4,407,701	47,954,877	9.2	34
DE_GB_DENI_4_2116	Wietze/Fuhse Lockergestein	86,916,393	147,101,059	59.1	182
DE_GB_DENI_4_2509	Wümme Lockergestein links	27,604,054	183,173,441	15.1	114
DE_GB_DENI_4_2508	Wümme Lockergestein rechts	9,575,455	159,109,858	6	44
DE_GB_DEST_NI10_2	Zehrengraben	1,516,164	6,706,832	22.6	12

Appendix B-2: Groundwater assessment results, sorted by river basins

The following tables list the groundwater bodies for which Lower Saxony is responsible with respect to the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins. The tables relate to: Chemical assessment and quantitative assessment.

Table 99: Overview of the chemical status of groundwater bodies, broken down by the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins

	Number of groundwater bodies	
	Good chemical status	Bad chemical status
Lower Saxony	**46**	**44**
Lower Saxony part of the Elbe RBU	4	6
Lower Saxony part of the Weser RBU	27	25
Lower Saxony part of the Ems RBU	13	9
Lower Saxony part of the Rhine RBU	2	4

Table 100: Overview of the quantitative status of groundwater bodies, broken down by the Lower Saxony parts of the Elbe, Weser, Ems and Rhine river basins

	Number of groundwater bodies	
	Good quantitative status	Failing to achieve good
Lower Saxony	**90**	**–**
Lower Saxony part of the Elbe RBU	10	–
Lower Saxony part of the Weser RBU	52	–
Lower Saxony part of the Ems RBU	22	–
Lower Saxony part of the Rhine RBU	6	–

Appendix B-3: Groundwater assessment results

The following Table 103 shows the pressures, assessment findings, deadline extensions and divergent management objectives for every groundwater body situated wholly or partially in Lower Saxony. Since the space available is not sufficient to describe the individual attributes, the following tables show the abbreviations used.

Table 101: Abbreviations: Chemical and quantitative status of groundwater bodies

Chemical status		Quantitative status	
Good	2	Good	2
Bad	3	Failing to achieve good	3

In view of the length of the entries, the head of Table 103 uses abbreviations that are listed in the following Table 102.

Table 102: Abbreviations for column headings in Table 103

Column heading Table 103	Abbreviation	
Water body number The water body number consists of the code for Germany (DE), the water body category (GW = groundwater), the federal state responsible for the water body, and a combination of numbers and letters	EU Code/WB No.	
Water body name	WB name	
Contamination	p27	Due to agricultural activities, e.g. use of fertilisers and crop protection agents, livestock density etc.)
	p29	Pressure due to urban construction
	p30	Pressure due to other diffuse sources
Chemical status 2008 (see Table 103)	CZ 08	
Chemical status 2013 (see Table 101)	CZ 13	

Column heading Table 103	Abbreviation
Quantitative status 2008 (see Table 101)	MZ 08
Quantitative status 2013 (see Table 101)	MZ 13
Deadline extensions (Sections 47, 29 WHG): Chemical status	FV CZ
Deadline extensions (Sections 47, 30 WHG): Chemical status	ABZ CZ
Lack of technical feasibility	TD
Unreasonably high cost	UA
Natural conditions	NG

To make it possible to consider the information at the level of individual water bodies, the following Table 103 lists the groundwater bodies located in Lower Saxony with their attributes and summarised information on deadline extensions and divergent management objectives.
For each water body, Table 103 shows the pressures, assessment findings, deadline extensions and divergent management objectives. The list includes not only water bodies for which Lower Saxony is responsible, but also water bodies which are located in Lower Saxony but which fall within the sphere of responsibility of neighbouring federal states. The table shows the latest ecological assessment findings. The results for 2008 are also shown. The methods for the current assessment and the results of the comparison are described in Chapters 4.3.2 and 13.4.2.

Table 103: Pressures, assessment results, deadline extensions and divergent management objectives for the groundwater bodies in Lower Saxony

RBU	EU Code/WB No.	WB name	Contamination	CZ 08	CZ 14	MZ 08	MZ 14	FV CZ			ABZ CZ	
								TD	UA	NG	TD	UA
Elbe river basin												
Elbe	DE_GB_DENI_NI11_3	Este-Seeve Lockergestein	p27	3	3	2	2	x	–	x	–	–
Elbe	DE_GB_DENI_NI11_2	Ilmenau Lockergestein links	p27	3	3	2	2	–	–	x	–	–
Elbe	DE_GB_DENI_NI11_1	Ilmenau Lockergestein rechts	–	2	2	2	2	–	–	–	–	–
Elbe	DE_GB_DENI_NI10_5	Jeetzel Lockergestein links	–	2	2	2	2	–	–	–	–	–
Elbe	DE_GB_DENI_NI10_1	Jeetzel Lockergestein rechts	p27,p30	3	3	2	2	x	–	x	–	–
Elbe	DE_GB_DENI_NI11_8	Land Hadeln Lockergestein	–	3	2	2	2	–	–	–	–	–
Elbe	DE_GB_DENI_NI11_5	Land Kehdingen Lockergestein	–	2	2	2	2	–	–	–	–	–
Elbe	DE_GB_DENI_NI11_4	Lühe-Schwinge Lockergestein	p27	3	3	2	2	–	–	x	–	–
Elbe	DE_GB_DEMV_MEL_SU_3	MEL_SU_3	p27	3	3	2	2	x	–	x	–	–
Elbe	DE_GB_DEMV_MEL_SU_4	MEL_SU_4	p27	2	3	2	2	x	–	x	–	–
Elbe	DE_GB_DEST_MBA 4	Milde-Biese-Aland4	p27,p30	3	3	2	2	x	–	x	–	–
Elbe	DE_GB_DEST_OT 1	Ohre-Tanger1	p27,p29, p30	3	3	2	2	x	–	x	–	–
Elbe	DE_GB_DENI_NI11_7	Oste Lockergestein links	p27,p30	3	3	2	2	x	–	x	–	–
Elbe	DE_GB_DENI_NI11_6	Oste Lockergestein rechts	p27	3	3	2	2	–	–	x	–	–
Elbe	DE_GB_DETH_SAL GW 037	SAL GW 037	–	3	2	2	2	–	–	–	–	–
Elbe	DE_GB_DEST_SAL GW 038	SAL GW 038	–	2	2	2	2	–	–	–	–	–
Elbe	DE_GB_DEST_SAL GW 039	SAL GW 039	–	2	2	2	2	–	–	–	–	–
Elbe	DE_GB_DEST_SAL GW 064	SAL GW 064	–	2	2	2	2	–	–	–	–	–
Elbe	DE_GB_DEST_SAL GW 066	SAL GW 066	p27	3	3	2	2	–	–	–	–	–
Elbe	DE_GB_DEST_NI10_2	Zehrengraben	–	2	2	2	2	–	–	–	–	–

RBU	EU Code/WB No.	WB name	Contamination	CZ 08	CZ 14	MZ 08	MZ 14	FV CZ			ABZ CZ	
								TD	UA	NG	TD	UA
Weser river basin												
Weser	DE_GB_DEHE_4_0023	4190_5117	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DEHE_4_0024	4190_5201	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DEHE_4_1043	4290_5201	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DEHE_4_2304	4300.1_5201	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2202	Böhme Lockergestein links	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2201	Böhme Lockergestein rechts	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DETH_4_2012	Eichsfelder Buntsandsteinscholle-Leine	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2115	Fuhse Lockergestein rechts	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2114	Fuhse mesozoisches Festgestein rechts	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENW_4_2408	Große Aue Lockergestein im Süden	–	2	3	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2413	Große Aue Lockergestein links	p27,p30	3	3	2	2	x	–	x	–	–
Weser	DE_GB_DENI_4_2412	Große Aue Lockergestein rechts	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENW_4_2308	Höxteraner Trias	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2504	Hunte Festgestein links	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2503	Hunte Festgestein rechts	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2505	Hunte Lockergestein links	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2502	Hunte Lockergestein rechts	p27,p30	3	3	2	2	x	–	x	–	–
Weser	DE_GB_DENI_4_2004	Innerste Harzpaläozoikum	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2005	Innerste mesozoisches Festgestein links	p30	3	3	2	2	x	–	–	–	–
Weser	DE_GB_DENI_4_2003	Innerste mesozoisches Festgestein rechts	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2104	Ise Lockergestein links	–	3	2	2	2	–	–	–	–	–

RBU	EU Code/WB No.	WB name	Contamination	CZ 08	CZ 14	MZ 08	MZ 14	FV CZ			ABZ CZ	
								TD	UA	NG	TD	UA
Weser	DE_GB_DENI_4_2103	Ise Lockergestein rechts	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2507	Jade Lockergestein links	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENW_4_2410	Kreide-Schichten zwischen Stemwede und Petershagen	–	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2016	Leine Lockergestein links	p27	3	3	2	2	x	–	x	–	–
Weser	DE_GB_DENI_4_2001	Leine Lockergestein rechts	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2014	Leine mesozoisches Festgestein links 1	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2015	Leine mesozoisches Festgestein links 2	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2013	Leine mesozoisches Festgestein rechts 1	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2007	Leine mesozoisches Festgestein rechts 2	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2006	Leine mesozoisches Festgestein rechts 3	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2002	Leine mesozoisches Festgestein rechts 4	p27	3	3	2	2	x	–	x	–	–
Weser	DE_GB_DENI_4_2404	Mittlere Weser Festgestein rechts	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2411	Mittlere Weser Lockergestein links 2	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2414	Mittlere Weser Lockergestein links 3	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2403	Mittlere Weser Lockergestein rechts	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENW_4_2407	Niederung der Weser	–	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENW_4_2320	Nördliche Herforder Mulde	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENW_4_2312	Nordlippische Trias-Gebiete	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2110	Obere Aller Lockergestein links	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2106	Obere Aller mesozoisches Festgestein links	p27	3	3	2	2	x	–	x	–	–
Weser	DE_GB_DENI_4_2302	Oberweser-Hameln	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2510	Ochtum Lockergestein	p27,p30	3	3	2	2	x	–	x	–	–

RBU	EU Code/WB No.	WB name	Contamination	CZ 08	CZ 14	MZ 08	MZ 14	FV CZ			ABZ CZ	
								TD	UA	NG	TD	UA
Weser	DE_GB_DENI_4_2108	Oker Harzpaläozoikum	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2111	Oker Lockergestein links	p27	2	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2112	Oker Lockergestein rechts	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2109	Oker mesozoisches Festgestein links	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2107	Oker mesozoisches Festgestein rechts	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2102	Örtze Lockergestein links	p27	3	3	2	2	x	–	x	–	–
Weser	DE_GB_DENI_4_2101	Örtze Lockergestein rechts	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENW_4_2314	Östlicher Teutoburger Wald	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2309	Ottensteiner Hochfläche	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENW_4_2409	Petershäger Kreide	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2008	Rhume Harzpaläozoikum	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2010	Rhume mesozoisches Festgestein links	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2009	Rhume mesozoisches Festgestein rechts	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENW_4_2317	Südliche Herforder Mulde	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENW_4_2310	Südlippische Trias-Gebiete	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENW_4_2301	Talaue der Weser südl. Wiehengebirge	–	3	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2203	Untere Aller Lockergestein links	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2506	Untere Weser Lockergestein links	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2501	Untere Weser Lockergestein rechts	p27,p30	3	3	2	2	x	–	x	–	–
Weser	DE_GB_DENI_4_2303	Vogler-Solling-Bramwald	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2318	Werre mesozoisches Festgestein	–	2	2	2	2	–	–	–	–	–
Weser	DE_GB_DENI_4_2113	Wietze/Fuhse Festgestein	p27	3	3	2	2	–	–	x	–	–

RBU	EU Code/WB No.	WB name	Contamination	CZ 08	CZ 14	MZ 08	MZ 14	FV CZ			ABZ CZ	
								TD	UA	NG	TD	UA
Weser	DE_GB_DENI_4_2116	Wietze/Fuhse Lockergestein	p27	3	3	2	2	–	–	x	–	–
Weser	DE_GB_DENI_4_2509	Wümme Lockergestein links	p27	3	3	2	2	x	–	x	–	–
Weser	DE_GB_DENI_4_2508	Wümme Lockergestein rechts	p27	3	3	2	2	–	–	x	–	–
Ems river basin												
Ems	DE_GB_DENI_39_04	Baltrum	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_39_01	Borkum	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_3_03	Große Aa	p27	3	3	2	2	–	–	x	–	–
Ems	DE_GB_DENI_36_03	Hase links Festgestein	p27	3	3	2	2	–	–	x	–	–
Ems	DE_GB_DENI_36_01	Hase links Lockergestein	p27	3	3	2	2	x	–	x	–	–
Ems	DE_GB_DENI_36_05	Hase Lockergestein rechts	p27	3	3	2	2	x	–	x	–	–
Ems	DE_GB_DENI_36_02	Hase rechts Festgestein	p27	2	3	2	2	–	–	x	–	–
Ems	DE_GB_DENI_39_02	Juist	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_39_05	Langeoog	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_38_01	Leda-Jümme Lockergestein links	p27	3	3	2	2	–	–	x	–	–
Ems	DE_GB_DENI_38_02	Leda-Jümme Lockergestein rechts	p27,p30	3	3	2	2	x	–	x	–	–
Ems	DE_GB_DENI_37_01	Mittlere Ems Lockergestein links	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_37_02	Mittlere Ems Lockergestein rechts 1	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_37_03	Mittlere Ems Lockergestein rechts 2	p27	3	3	2	2	x	–	x	–	–
Ems	DE_GB_DENW_3_05	Niederung der Oberen Ems (Greven/Ladbergen)	–	3	3	2	2	–	–	x	–	–
Ems	DE_GB_DENW_3_06	Niederung der Oberen Ems (Sassenberg/Versmold)	–	3	3	2	2	–	–	x	–	–
Ems	DE_GB_DENI_39_08	Norderland/Harlinger Land	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_39_03	Norderney	–	2	2	2	2	–	–	–	–	–

RBU	EU Code/WB No.	WB name	Contamination	CZ 08	CZ 14	MZ 08	MZ 14	FV CZ			ABZ CZ	
								TD	UA	NG	TD	UA
Ems	DE_GB_DENI_3_01	Obere Ems links (Plantlünner Sandebene West)	p27	2	3	2	2	–	–	x	–	–
Ems	DE_GB_DENW_3_02	Plantlünner Sandebene (Mitte)	–	3	3	2	2	–	–	x	–	–
Ems	DE_GB_DENI_39_06	Spiekeroog	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_36_04	Teutoburger Wald - Hase	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENW_3_15	Teutoburger Wald (Nordwest)	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_39_10	Untere Ems Lockergestein links	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_39_09	Untere Ems rechts	–	2	2	2	2	–	–	–	–	–
Ems	DE_GB_DENI_39_07	Wangerooge	–	2	2	2	2	–	–	–	–	–
Rhine river basin												
Rhine	DE_GB_DENI_928_25	Bentheimer Berg	–	2	2	2	2	–	–	–	–	–
Rhein	DE_GB_DENI_928_28	Grenzaa	p27	3	3	2	2	–	–	x	–	–
Rhein	DE_GB_DENI_928_27	Itter	p27	3	3	2	2	–	–	x	–	–
Rhein	DE_GB_DENW_928_06	Niederung der Dinkel	–	2	2	2	2	–	–	–	–	–
Rhein	DE_GB_DENW_928_07_1	Niederung der Vechte	–	2	2	2	2	–	–	–	–	–
Rhein	DE_GB_DENI_928_24	Niederung der Vechte links	–	2	2	2	2	–	–	–	–	–
Rhein	DE_GB_DENI_928_23	Niederung der Vechte rechts	p27	3	3	2	2	x	–	x	–	–
Rhein	DE_GB_DENW_928_10	Ochtruper Sattel	–	3	3	2	2	–	–	x	–	–
Rhein	DE_GB_DENI_928_26	Untere Vechte links	p27	3	3	2	2	–	–	x	–	–

Appendix C – Impacts of climate change

Table 104: Direct and indirect impacts of climate change on water bodies

	Possible direct impacts of climate change	Potential consequences for water quantity and quality	Fields of action	Measures in the LAWA list for adaptation to climate change
1		**Surface run-off**		
1.1	Increased summer air temperatures, reduced summer rainfall	Increase in duration and intensity of low-water periods: frequent longer dry periods can give rise to lower mean monthly discharges or lower low-water discharges. This can lead to drying out of bank areas, sandbank formation, drying out of water bodies, heavier erosion of banks, and oxygen deficiency in the water bodies.	• Assessment of changes Precautionary measures • Management measures, e.g. improvements in continuity and water body morphology • Increase in water retention over large areas • Reduction in heat load • Adaptive reservoir management	17 Heat inputs 45-53 reductions in water abstraction 61-65 e.g. measures to improve minimum discharge, restore typical water body specific discharge behaviour and promote natural retention.
1.2	Greater variability of N events, more frequent and more intensive extreme events	Increase in frequency of flooding: Larger and longer discharges can result not only in major disasters, but also – increasingly – in small and medium scale flooding. These frequently occur only on a regional basis.	• Regional studies • Review of plans and concepts • Possible measures include natural retention, precautionary flood control measures, technical flood control, adaptive reservoir management	65 Measures to promote natural water retention 67-70 Continuity 71-79 Improvements in water body structure
2		**Groundwater (Quantity)**		
2.1	Increase in winter rainfall	Increase in groundwater recharge in winter months and increase in waterlogging in areas close to water bodies: regional variations may occur depending on regional differences in rainfall, soil conditions and other factors such as surface sealing.	• Drainage of agricultural land • Protection of buildings and infrastructure from groundwater-induced waterlogging • Forest conversion	

	Possible direct impacts of climate change	Potential consequences for water quantity and quality	Fields of action	Measures in the LAWA list for adaptation to climate change
2.2	Decrease in summer rainfall	Decrease in groundwater recharge in summer months and falling water tables: this can result in falling groundwater levels, which may also be exacerbated by longer vegetation periods with increased demand for irrigation and livestock water for the agricultural sector and a potential increase in surface water supply from the groundwater in dry periods.	• Sustainable groundwater management (e.g. taking account of possible impacts on groundwater recharge when granting long-lasting water rights in excess of 10 years) • Determining abstraction options • specific adaptation measures for operators of water supply facilities (water networks, controlled infiltration, groundwater regeneration, measures aimed at efficient use of water in all consumption sectors (household, services, industry etc.)) • Selection and monitoring of suitable indicator parameters in untreated water and drinking water • Optimising agricultural watering (e.g. introduction of trickle irrigation methods or watering with purified wastewater) • Registration of all agricultural water abstraction from the ground water bodies	43 Drinking water supply 54-60 Water abstraction 57 Reduction of water abstraction for the agricultural sector 59 Groundwater regeneration
3		**Quality of surface water bodies**		
3.1	More frequent and more intensive heavy rainfall events	Increased inputs of nutrients and pollutants: these can originate from agricultural land, overloading of combined sewer systems or more frequent flooding. These processes are favoured by a potential increase in the length of vegetation periods.	• Adaptation strategies for agricultural land use • Dewatering strategies in wastewater management (create adequate flood safety facilities…)	16-22 Reductions in point-source inputs 24-37, 100 Reductions in diffuse inputs, maintenance of drinking water supplies

	Possible direct impacts of climate change	Potential consequences for water quantity and quality	Fields of action	Measures in the LAWA list for adaptation to climate change
3.2	Increased air temperatures, greater insolation	Increased water temperatures and less dissolved oxygen in water bodies: this influences the conversion processes. Lower water levels can also reduce flow rates. All in all, this can exert pressures on the aquatic community.	• Varying hydromorphological structures as opportunities for retreat • Continuity of flowing waters • Maintenance and restoration of near-natural infrastructures • Achievement of good ecological status	88-90 Fisheries 92-96 Reductions in other pressures
3.3	Increased air temperatures, greater insolation	Changes in thermal stratification in lakes: this can influence the nutrient supply and water quality, which could give rise to silting-up processes. Problems with blue-green algae could increase. Elevated (faecal) microbial contamination could occur.	• Preservation of aquatic community	66 Improving water balance 80 Morphology 86 Hydromorphology
4		**Groundwater quality**		
4.1	Increased air temperatures, changes in rainfall	Increased migration of nutrients from the soil zone: decisive factors here are increased leaching in winter or reduced uptake by plants as a result of reduced growth in dry periods. This can also lead to increased leaching of nutrients and crop protection agents from agricultural land in winter or to leaching from structures. Increased input of water-borne pathogens into drinking water resources following heavy rainfall events and flooding	• Adaptation strategies for agricultural land use • Appropriate execution of structures • Increased research and development requirements for modelling impacts of climate change on nitrate concentrations seepage water (changes in N-mineralisation and seepage water quantity)	38-42, 44 Reduction in diffuse pressures 99 Reductions in other pressures

	Possible direct impacts of climate change	Potential consequences for water quantity and quality	Fields of action	Measures in the LAWA list for adaptation to climate change
4.2	Increased air temperatures	Changes in groundwater flow in coastal regions: The rise in sea level may lead to changes in gradients between coastal waters and groundwater. This may give rise to progressive salination of the groundwater in coastal areas.	• Adaptation strategies for agricultural land use • Specific adaptation measures for operators of water supply facilities (water networks, deeper wells…)	97 Measures to reduce salt water intrusions
5		**Coastal waters/Marine ecology**		
5.1	Increased air temperatures, increasing evaporation	Accelerated rise in sea level: reasons include faster melting of land ice masses and thermal expansion of the upper layers of water. This can give rise to higher storm flood levels and pressures on coasts and coastal defence facilities. The consequences could include shifting of brackish water boundaries with salination of water for crops and livestock.	• Determine range of variation of impacts • Lay down additional climate margins for dyke sizes and precautionary construction dimensions for technical structures • Review and, where appropriate, adapt existing strategies and plans	81-85, 87 Reduction in pressures 91 Fisheries
5.2	Increased CO2 inputs	Acidification of marine waters: this may hinder calcium formation, with potential impacts on marine ecosystems	• Implementation of international marine protection provisions	
5.3	Increased air temperatures	Warming of marine waters: this may give rise to changes in the composition of existing communities.	• Implementation of international marine protection provisions	

	Possible direct impacts of climate change	Potential consequences for water quantity and quality	Fields of action	Measures in the LAWA list for adaptation to climate change
6		**Water management facilities**		
6.1	Increase in heavy rainfall events	Domestic water supplies: overloading of drainage facilities, heavy demands on drainage systems, buildings, transport infrastructure (e.g. roads)	• Review use of storage capacities • Measures for safe discharge of wastewater • Emergency strategies • Sustainable decentralised management of rainwater	1-15 Sewage plants 10-12 Rainwater and combined water
6.2	Increased air temperatures, reduced summer rainfall	Cooling water: cooling water for installations it is no longer available in adequate quantities, cooling water discharges into water bodies are no longer possible on the desired scale	• Alternative, discharge-independent • cooling facilities • Compensation of temporary reductions in cooling performance • Adaptation of heat load plans	17 Heat inputs
6.3	Changes in rainfall and air temperature	Shipping: changes in discharge regime can impact on inland waterway shipping	• Adaptation measures (more maintenance, investment in infrastructure, improvements in water management)	

Climate protection measures that can have indirect impacts on water bodies:

Purpose	Measure	Impacts on water bodies	
Climate protection through promotion of renewable energies	Renewable Energy Sources Act leads to more biogas plants on the basis of energy crops, farmyard manure and biowaste. The quota system controls the market for production of biofuels from biomass (e.g. increased growing of rapeseed for biodiesel)	• Changes in land use: targeted growing of renewable raw materials, especially maize, is expected to give rise to increased nitrate concentrations in the groundwater • Competition for land • Accidental contamination of water bodies (in some cases with extreme oxygen deficiencies)	27-32 Measures to reduce inputs of substances from agricultural sector Determine the impacts of growing renewable raw materials on regional N balances and N surpluses
	More use of hydropower	• Adverse effects on aquatic habitats in the water body • Good ecological status cannot develop in the backwaters of hydro-power plants, which always means failure to achieve the WFD objectives	
	Geothermal plants	Risk of adverse effects on groundwater due to incorrect execution of geothermal plants (e.g. through undesirable hydraulic connections between groundwater storeys)	

Appendix D – Water-dependent protected areas

Table 105: Water-dependent Habitats Directive and Birds Directive areas

Area number	Area name	Area (ha)	Type
3613331	Achmer Sand	278.17	FFH
3609302	Ahlder Pool	37	FFH
2218301	Ahlen-Falkenberger Moor, Seen bei Bederkesa	2877	FFH
3513401	Alfsee	323	VSG
3021331	Aller (mit Barnbruch), untere Leine, untere Oker	18030.69	FFH
3525331	Altwarmbüchener Moor	1221.67	FFH
3019301	Amphibienbiotop Friedeholzer Schlatt	17	FFH
4024301	Amphibienbiotope an der Hohen Warte	77	FFH
2218302	Aßbütteler und Herrschaftliches Moor	288	FFH
3829301	Asse	648	FFH
2522301	Auetal und Nebentäler	753	FFH
3312331	Bäche im Artland	1481.21	FFH
4623331	Bachtäler im Kaufunger Wald	1298.39	FFH
4229331	Bachtäler im Oberharz um Braunlage	415.73	FFH
3115301	Bäken der Endeler und Holzhauser Heide	508	FFH
2220301	Balksee und Randmoore, Nordahner Holz	1513	FFH
4523303	Ballertasche	44	FFH
2811331	Barger Meer	7	FFH
3530401	Barnbruch	2112	VSG
3117331	Bassumer Friedeholz	56.72	FFH
3630301	Beienroder Holz	547	FFH
3608302	Bentheimer Wald	780	FFH
3609301	Berger Keienvenn	5.7	FFH
4229303	Bergwiesen bei St. Andreasberg	215.29	FFH
4127304	Bergwiesen und Teiche bei Zellerfeld	102	FFH

Area number	Area name	Area (ha)	Type
4329301	Bergwiesen und Wolfsbachtal bei Hohegeiß	244	FFH
3825331	Beuster (mit NSG 'Am roten Steine')	87.71	FFH
2627331	Birken-Eichenwald bei Sangenstedt	36.07	FFH
3424301	Bissendorfer Moor	583	FFH
3625331	Bockmerholz, Gaim	1094.92	FFH
3427301	Bohlenbruch	171	FFH
2924301	Böhme	1711.71	FFH
3226301	Bornriethmoor	113	FFH
3312332	Börsteler Wald und Teichhausen	140.61	FFH
2721331	Borstgrasrasen bei Badenstedt	6.93	FFH
2522302	Braken	639	FFH
3426301	Brand	464	FFH
3227301	Breites Moor	121	FFH
2717332	Brundorfer Moor	11.26	FFH
2830331	Buchen- und Eichenwälder in der Göhrde (mit Breeser Grund)	805.08	FFH
4524302	Buchenwälder und Kalk-Magerrasen zwischen Dransfeld u. Hedemünden	1496	FFH
3129301	Bullenkuhle	2.55	FFH
2721301	Bullensee, Hemelsmoor	292	FFH
3120331	Burckhardtshöhe	104.95	FFH
4022302	Burgberg, Heinsener Klippen, Rühler Schweiz	2695.83	FFH
2416431	Butjadingen	5444	VSG
3408401	Dalum-Wietmarscher Moor und Georgsdorfer Moor	2678	VSG
3414331	Dammer Berge	772.24	FFH
3513331	Darnsee	15.8	FFH
2917331	Delmetal zwischen Harpstedt und Delmenhorst	476.06	FFH
3315331	Diepholzer Moor	459.24	FFH
3418401	Diepholzer Moorniederung	12648	VSG
3015331	Döhler Wehe	68.22	FFH
3731331	Dorm	677.2	FFH
2616331	Dornebbe, Braker Sieltief und Colmarer Tief	13.35	FFH

Area number	Area name	Area (ha)	Type
2317302	Dorumer Moor	211	FFH
4525332	Dramme	39.71	FFH
2931401	Drawehn	7018	VSG
3431331	Drömling	4224.26	FFH
3431401	Drömling	4219	VSG
3924331	Duinger Wald mit Doberg und Weenzer Bruch	439.71	FFH
3415301	Dümmer	2965	FFH
3415401	Dümmer	4630	VSG
3021333	Dünengebiet bei Neumühlen	54.3	FFH
3613332	Düte (mit Nebenbächen)	117.5	FFH
2715331	Eichenbruch, Ellernbusch	131.44	FFH
3629301	Eichen-Hainbuchenwälder zwischen Braunschweig und Wolfsburg	1324	FFH
2526332	Elbe zwischen Geesthacht und Hamburg	573.41	FFH
2528331	Elbeniederung zwischen Schnackenburg und Geesthacht	22654.31	FFH
2714332	Elmendorfer Holz	28.18	FFH
3715331	Else und obere Hase	55.13	FFH
3922301	Emmer	658.67	FFH
2809331	Ems	8216.66	FFH
2609401	Emsmarsch von Leer bis Emden	4019	VSG
2909401	Emstal von Lathen bis Papenburg	4574	VSG
3509401	Engdener Wüste	1006	VSG
3226331	Entenfang Boye und Bruchbach	297.41	FFH
3427331	Erse	75.68	FFH
2524331	Este, Bötersheimer Heide, Glüsinger Bruch und Osterbruch	1127.75	FFH
3309331	Esterfelder Moor bei Meppen	1.31	FFH
2911302	Esterweger Dose	1236	FFH
2911401	Esterweger Dose	6441	VSG
2524332	Este-Unterlauf	7.03	FFH
2814332	Everstenmoor	112.4	FFH
2410401	Ewiges Meer	1286	VSG

Area number	Area name	Area (ha)	Type
2410301	Ewiges Meer, Großes Moor bei Aurich	1138	FFH
2317331	Extensivweiden nördlich Langen	4.27	FFH
3528301	Fahle Heide, Gifhorner Heide	355.5	FFH
2423301	Feerner Moor	179	FFH
2611401	Fehntjer Tief	2313	VSG
2511331	Fehntjer Tief und Umgebung	2496.99	FFH
3522331	Feuchtgebiet 'Am Weißen Damm'	20.4	FFH
3518331	Feuchtwiese bei Diepenau	0.53	FFH
2813331	Fintlandsmoor und Dänikhorster Moor	240.05	FFH
3322331	Fledermauslebensraum bei Rodewald	393.62	FFH
3614334	Fledermauslebensraum Wiehengebirge bei Osnabrück	1167.04	FFH
2519332	Franzhorn	143.55	FFH
3526331	Fuhse-Auwald bei Uetze (Herrschaft)	149.99	FFH
4523331	Fulda zwischen Wahnhausen und Bonaforth	108.23	FFH
2715332	Funchsbüsche, Ipweger Büsche	93.8	FFH
2717331	Garlstedter Moor und Heidhofer Teiche	307.78	FFH
2726331	Garlstorfer und Toppenstedter Wald	416.04	FFH
2713332	Garnholt	31.58	FFH
3118331	Geestmoor und Klosterbachtal	376.86	FFH
3513332	Gehn	508.3	FFH
2832331	Gewässersystem der Jeetzel mit Quellwäldern	583	FFH
2626331	Gewässersystem der Luhe und unteren Neetze	2479.4	FFH
3708302	Gildehauser Venn	645	FFH
4329303	Gipskarstgebiet bei Bad Sachsa	1495	FFH
4226301	Gipskarstgebiet bei Osterode	1327	FFH
2812332	Glittenberger Moor	28.61	FFH
2812331	Godensholter Tief	85.26	FFH
3216301	Goldenstedter Moor	638	FFH
4325301	Göttinger Wald	4878	FFH
3930331	Grabensystem Großes Bruch	76.31	FFH

Area number	Area name	Area (ha)	Type
3613301	Grasmoor	24	FFH
3515331	Grenzkanal	0.35	FFH
3027401	Große Heide bei Unterlüß und Kiehnmoor	1882	VSG
4524301	Großer Leinebusch	180	FFH
2509331	Großes Meer, Loppersumer Meer	891.07	FFH
3125301	Großes Moor bei Becklingen	783	FFH
3329332	Großes Moor bei Gifhorn	2630.34	FFH
3429401	Großes Moor bei Gifhorn	2937	VSG
2723301	Großes Moor bei Wistedt	157	FFH
2922301	Großes und Weißes Moor	435	FFH
3023301	Grundloses Moor	290	FFH
3610301	Gutswald Stovern	114	FFH
2814331	Haaren und Wold bei Wechloy	200.47	FFH
3018331	Hachetal	248.33	FFH
3120332	Hägerdorn	57.12	FFH
2522331	Hahnenhorst	65.24	FFH
3626301	Hahnenkamp	45	FFH
3311301	Hahnenmoor, Hahlener Moor, Suddenmoor	1205	FFH
3927301	Hainberg, Bodensteiner Klippen	1191	FFH
3823331	Hallerbruch	212.44	FFH
3724331	Hallerburger Holz	171.29	FFH
3822331	Hamel und Nebenbäche	253.2	FFH
3626331	Hämeler Wald	1019.67	FFH
2719401	Hammeniederung	6296	VSG
3929331	Harly, Ecker und Okertal nördlich Vienenburg	681.91	FFH
2916301	Hasbruch	627.9	FFH
2916301	Hasbruch	627.9	VSG
3825301	Haseder Busch, Giesener Berge, Gallberg, Finkenberg	742	FFH
3828401	Heerter See	272	VSG
3830301	Heeseberg-Gebiet	277	FFH

Area number	Area name	Area (ha)	Type
3126331	Heiden und Magerrasen in der Südheide	630.59	FFH
3013301	Heiden und Moore an der Talsperre Thülsfeld	434	FFH
3324331	Hellern bei Wietze	65.83	FFH
3423331	Helstorfer, Otternhagener und Schwarzes Moor	1663.61	FFH
3326331	Henneckenmoor bei Scheuen	36	FFH
3116301	Herrenholz	281	FFH
3508301	Heseper Moor, Engdener Wüste	795	FFH
3825401	Hildesheimer Wald	1247	VSG
2421331	Hohes Moor	853.96	FFH
3319331	Hohes Moor bei Kirchdorf	630	FFH
3823332	Höhlengebiet im Kleinen Deister	106.71	FFH
2712331	Holtgast	35.55	FFH
4123301	Holzberg bei Stadtoldendorf, Heukenberg	781	FFH
3713331	Hüggel, Heidhornberg und Roter Berg	249.84	FFH
2507301	Hund und Paapsand	2557	FFH
2507301	Hund und Paapsand	2557	VSG
3615331	Hunte bei Bohmte	8.87	FFH
2816401	Hunteniederung	1080	VSG
2620301	Huvenhoopssee, Huvenhoopsmoor	139	FFH
2510331	Ihlower Forst	327.48	FFH
4124302	Ilme	705.78	FFH
2628331	Ilmenau mit Nebenbächen	5381.85	FFH
3927302	Innerste-Aue (mit Kahnstein)	266	FFH
3928401	Innerstetal von Langelsheim bis Groß Düngen	554	VSG
2715301	Ipweger Moor, Gellener Torfmöörte	316	FFH
3229331	Ise mit Nebenbächen	272.34	FFH
3823301	Ith	3655	FFH
4226331	Kalktuffquellen bei Westerhof	3.96	FFH
3118332	Kammmolch-Biotop bei Bassum	4.54	FFH
3018332	Kammmolch-Biotop bei Syke	159.97	FFH

Area number	Area name	Area (ha)	Type
2929331	Kammmolch-Biotop Mührgehege/Oetzendorf	108.07	FFH
3130331	Kammmolch-Biotop nordöstlich Langenbrügge	72.16	FFH
3614332	Kammmolch-Biotop Palsterkamp	63.36	FFH
3527332	Kammmolch-Biotop Plockhorst	40.29	FFH
3925332	Kammmolch-Biotop Röderhofer Teiche	79.31	FFH
3827332	Kammmolch-Biotop Tagebau Haverlahwiese	116.7	FFH
2724331	Kauers Wittmoor	33.36	FFH
3727331	Klein Lafferder Holz	89.34	FFH
3708331	Kleingewässer Achterberg	2.77	FFH
3227331	Kleingewässer bei Dalle	5.21	FFH
2511332	Kollrunger Moor und Klinge	479.85	FFH
2910301	Krummes Meer, Aschendorfer Obermoor	784	FFH
2508401	Krummhörn	5776	VSG
2617331	Kuhlmoor, Tiefenmoor	40.75	FFH
3419401	Kuppendorfer Böhrde	687	VSG
2117331	Küstenheiden und Krattwälder bei Cuxhaven	953.51	FFH
2912331	Lahe	34.34	FFH
3031301	Landgraben- und Dummeniederung	4931	FFH
3032401	Landgraben- und Dummeniederung	3970	VSG
3012331	Langelt	50.1	FFH
2727331	Laubwälder am Einemhof und Kranichmoor	94.05	FFH
3623332	Laubwälder südlich Seelze	473.56	FFH
4024332	Laubwälder und Klippenbereiche im Selter, Hils und Greener Wald	1521.99	FFH
3630401	Laubwälder zwischen Braunschweig und Wolfsburg	3304.9	VSG
2911301	Leegmoor	461	FFH
3022331	Lehrde und Eich	762.76	FFH
4525333	Leine zwischen Friedland und Niedernjesa	53.62	FFH
3824332	Leineaue unter dem Rammelsberg	189.14	FFH
3624331	Leineaue zwischen Hannover und Ruthe	967.84	FFH
4225401	Leinetal bei Salzderhelden	1129	VSG

Area number	Area name	Area (ha)	Type
3727401	Lengeder Teiche	145	VSG
2613301	Lengener Meer, Stapeler Moor, Baasenmeers-Moor	1560	FFH
4023332	Lenne	48.35	FFH
3221331	Lichtenmoor	359.01	FFH
3824331	Limberg bei Elze	169.5	FFH
3724332	Linderter und Stamstorfer Holz	105.06	FFH
3410331	Lingener Mühlenbach und Nebenbach	19.18	FFH
2929301	Lohn	175	FFH
2933401	Lucie	8229	VSG
2725301	Lüneburger Heide	23286	FFH
2725301	Lüneburger Heide	23286	VSG
3127331	Lutter, Lachte, Aschau (mit einigen Nebenbächen)	5113.62	FFH
3730333	Lutterlandbruch	83.73	FFH
3528331	Maaßel	188.56	FFH
2711331	Magerwiese bei Potshausen	3.26	FFH
2519331	Malse	80.2	FFH
2714331	Mansholter Holz, Schippstroht	289.63	FFH
3012301	Markatal mit Bockholter Dose	268	FFH
2514431	Marschen am Jadebusen	7712	VSG
2932301	Maujahn	37	FFH
4625331	Mausohr-Jagdgebiet Leinholz	340.09	FFH
3627332	Meerdorfer Holz	363.01	FFH
3224331	Meißendorfer Teiche, Ostenholzer Moor	3299.16	FFH
3625332	Mergelgrube bei Hannover	18.05	FFH
2716331	Mittlere und Untere Hunte (mit Barneführer Holz und Schreensmoor)	573.99	FFH
2923331	Moor am Schweinekobenbach	63.78	FFH
3124301	Moor- und Heidegebiete im Truppenübungsplatz Bergen-Hohne	7101	FFH
3026302	Moor- und Heidegebiete im Truppenübungsplatz Munster-Süd	2932	FFH
2524401	Moore bei Buxtehude	1289	VSG
2723401	Moore bei Sittensen	1929	VSG

Area number	Area name	Area (ha)	Type
4123302	Moore und Wälder im Hochsolling, Hellental	1430	FFH
3409331	Moorschlatts und Heiden in Wachendorf	109.9	FFH
4229402	Nationalpark Harz	15559	VSG
4129302	Nationalpark Harz (Niedersachsen)	15770	FFH
2306301	Nationalpark Niedersächsisches Wattenmeer	276956.22	FFH
2516331	Nebenarme der Weser mit Strohauser Plate und Juliusplate	1637.34	FFH
2934301	Nemitzer Heide	1061	FFH
3926331	Nette und Sennebach	292.05	FFH
2513331	Neuenburger Holz	664.39	FFH
2523331	Neuklosterholz	240.64	FFH
3317301	Neustädter Moor	1989	FFH
2832401	Niedersächsische Mittelelbe	34010	VSG
2210401	Niedersächsisches Wattenmeer und angrenzendes Küstenmeer	354882	VSG
2418331	Niederung von Geeste und Grove	495.18	FFH
3211431	Niederungen der Süd- und Mittelradde und der Marka	4377	VSG
2518331	Niederungen von Billerbeck und Oldendorfer Bach	400.19	FFH
3321331	Nienburger Bruch	112.48	FFH
3730303	Nordwestlicher Elm	1460	FFH
3014302	NSG Baumweg	57	FFH
3616301	Obere Hunte	147	FFH
3723331	Oberer Feldbergstollen im Deister	0.14	FFH
4127303	Oberharzer Teichgebiet	576	FFH
2311331	Ochsenweide, Schafhauser Wald und Feuchtwiesen bei Esens	214.12	FFH
2221301	Oederquarter Moor	84	FFH
2912332	Ohe	22.68	FFH
3230331	Ohreaue	199.55	FFH
3019331	Okeler Sandgrube	3.53	FFH
4029401	Okertal bei Vienenburg	470	VSG
3416302	Oppenweher Moor	394	FFH
3416302	Oppenweher Moor	394	VSG

Area number	Area name	Area (ha)	Type
3026301	Örtze mit Nebenbächen	1772	FFH
4424301	Ossenberg-Fehrenbusch	677	FFH
2520331	Oste mit Nebenbächen	3720.15	FFH
3224401	Ostenholzer Moor und Meißendorfer Teiche	3376	VSG
3820331	Ostenuther Kiesteiche	41.23	FFH
2320332	Osteschleifen zwischen Kranenburg und Nieder-Ochtenhausen	49.55	FFH
2509401	Ostfriesische Meere	5922	VSG
2309431	Ostfriesische Seemarsch zwischen Norden und Esens	8043	VSG
3218332	Pastorendiek und Amphibiengewässer nördlich Schwaförden	44.06	FFH
3729301	Pfeifengras-Wiese bei Schapen, Schapener Forst	89	FFH
3730331	Pfeifengraswiese Wohld	85.22	FFH
3631331	Pfeifengras-Wiesen und Binnensalzstelle bei Grasleben	100.94	FFH
2517301	Placken-, Königs- und Stoteler Moor	481	FFH
3021334	Poggenmoor	14.48	FFH
3016301	Poggenpohlsmoor	114	FFH
3411331	Pottebruch und Umgebung	158.81	FFH
4023331	Quellsumpf am Heiligenberg	5.97	FFH
3424331	Quellwald bei Bennemühlen	15.5	FFH
3421301	Rehburger Moor	1188	FFH
3416301	Rehdener Geestmoor	1737	FFH
4525331	Reinhäuser Wald	1207.92	FFH
2718301	Reithbruch	73	FFH
3418301	Renzeler Moor	467	FFH
2709401	Rheiderland	8685	VSG
3729332	Riddagshäuser Teiche	496.2	FFH
3729332	Riddagshäuser Teiche	496.2	VSG
3925331	Riehe, Alme, Gehbeck und Subeck	12.17	FFH
2924331	Riensheide	140.83	FFH
3630331	Rieseberger Moor	159.75	FFH
3821331	Rinderweide	38.22	FFH

Area number	Area name	Area (ha)	Type
3329301	Rössenbergheide-Külsenmoor, Heiliger Hain	418	FFH
2830332	Rotbauchunken-Vorkommen Strothe/Almstorf	202.6	FFH
3730332	Roter Berg (mit Lenebruch, Heiligenholz und Fünfgemeindeholz)	134.46	FFH
3824333	Saale mit Nebengewässern	39.83	FFH
2815331	Sager Meer, Ahlhorner Fischteiche und Lethe	868.95	FFH
3928301	Salzgitterscher Höhenzug (Südteil)	2013	FFH
3609303	Samerrott	313	FFH
3021332	Sandgrube bei Walle	5.31	FFH
2913331	Sandgrube Pirgo	1.73	FFH
3520332	Schaumburger Wald	1496.92	FFH
3520431	Schaumburger Wald	4159	VSG
2718331	Schönebecker Aue	97.14	FFH
2513301	Schwarzes Meer	16	FFH
2824331	Schwarzes Moor und Seemoor	82.52	FFH
3229401	Schweimker Moor und Lüderbruch	845	VSG
2322301	Schwingetal	1961	FFH
4323331	Schwülme und Auschnippe	352.35	FFH
4426301	Seeanger, Retlake, Suhletal	391	FFH
4426302	Seeburger See	115	FFH
2526331	Seeve	884.11	FFH
2418301	Sellstedter See und Ochsentriftmoor	527	FFH
4228331	Sieber, Oder, Rhume	2450.51	FFH
2518301	Silbersee, Laaschmoor, Bülter See, Bülter Moor	406	FFH
4223401	Solling	4060	VSG
4022431	Sollingvorland	16885	VSG
2722331	Sotheler Moor	66.99	FFH
2520332	Spreckenser Moor	63.35	FFH
2619302	Springmoor, Heilsmoor	244	FFH
3210301	Stadtveen, Kesselmoor, Süd-Tannenmoor	30	FFH
4329302	Staufenberg	144	FFH

Area number	Area name	Area (ha)	Type
3521401	Steinhuder Meer	5327	VSG
3420331	Steinhuder Meer (mit Randbereichen)	5371.31	FFH
2918331	Steller Heide	76.25	FFH
2822331	Stellmoor und Weichel	219.8	FFH
2917332	Stenumer Holz	93.89	FFH
3010331	Stillgewässer bei Kluse	52.11	FFH
4029331	Stimmecke bei Suderode (niedersächsischer Teil)	0.4	FFH
2916331	Stühe	209.18	FFH
4329401	Südharz bei Zorge	1164	VSG
3227401	Südheide und Aschauteiche bei Eschede	8514	VSG
3630332	Sundern bei Boimstorf	176.73	FFH
3520331	Sündern bei Loccum	306.34	FFH
3720301	Süntel, Wesergebirge, Deister	2497	FFH
3411332	Swatte Poele	4.09	FFH
3318331	Swinelake bei Barenburg	19.8	FFH
3608301	Syen-Venn	201	FFH
2915331	Tannersand und Gierenberg	29.65	FFH
4123331	Teiche am Erzbruch und Finkenbruch im Solling	2.57	FFH
3714331	Teiche an den Sieben Quellen	48.38	FFH
2408331	Teichfledermaus-Gewässer im Raum Aurich	57.95	FFH
2517331	Teichfledermaus-Gewässer im Raum Bremerhaven/Bremen	448.63	FFH
3319332	Teichfledermaus-Gewässer im Raum Nienburg	687.09	FFH
2312331	Teichfledermaus-Habitate im Raum Wilhelmshaven	308.74	FFH
3329331	Teichgut in der Oerreler Heide	52.23	FFH
3720331	Teufelsbad	66.76	FFH
3813331	Teutoburger Wald, Kleiner Berg	2294.46	FFH
3508331	Tillenberge	94.03	FFH
3110301	Tinner Dose, Sprakeler Heide	3955	FFH
3110301	Tinner Dose, Sprakeler Heide	3955	VSG
3825302	Tongrube Ochtersum	1.42	FFH

Area number	Area name	Area (ha)	Type
4423305	Totenberg (Bramwald)	432	FFH
3425301	Trunnenmoor	171	FFH
3124401	Truppenübungsplatz Bergen	12449	VSG
3026401	Truppenübungsplätze Munster Nord und Süd	7583	VSG
3222401	Untere Allerniederung	5387	VSG
2817331	Untere Delme, Hache, Ochtum und Varreler Bäke	82.42	FFH
3210302	Untere Haseniederung	2119	FFH
2526402	Untere Seeve- und Untere Luhe-Ilmenau-Niederung	871	VSG
2718332	Untere Wümmeniederung, untere Hammeniederung mit Teufelsmoor	4153.32	FFH
2018331	Unterelbe	18789.7	FFH
2121401	Unterelbe	16715	VSG
2507331	Unterems und Außenems	7376.81	FFH
3719331	Unternammer Holz (niedersächsischer Teil)	23.53	FFH
2316331	Unterweser	3512.14	FFH
2617401	Unterweser	3839	VSG
2413331	Upjever und Sumpfmoor Dose	118.81	FFH
3122301	Vehmsmoor	256	FFH
3430301	Vogelmoor	273	FFH
2314431	Voslapper Groden-Nord	258	VSG
2414431	Voslapper Groden-Süd	362	VSG
3314331	Wald bei Burg Dinklage	118.31	FFH
4223301	Wälder im östlichen Solling	1458	FFH
4222331	Wälder im südlichen Solling	1029.89	FFH
3729331	Wälder und Kleingewässer zwischen Mascherode und Cremlingen	659.32	FFH
3732303	Wälder und Pfeifengras-Wiesen im südl. Lappwald	728	FFH
2213401	Wangerland	1928	VSG
2322331	Wasserkruger Moor und Willes Heide	56.73	FFH
2921332	Wedeholz	182.52	FFH
4624331	Weiher am Kleinen Steinberg	14.59	FFH
3608331	Weiher am Syenvenn	9.52	FFH

Area number	Area name	Area (ha)	Type
3627401	Wendesser Moor	138	VSG
3420401	Wesertalaue bei Landesbergen	579	VSG
2320331	Westerberge bei Rahden	186.67	FFH
2408401	Westermarsch	2538	VSG
2820301	Wiestetal, Glindbusch, Borchelsmoor	837	FFH
3217331	Wietingsmoor	2815.59	FFH
2713331	Wittenheim und Silstro	94.22	FFH
2710331	Wolfmeer	33.2	FFH
2921331	Wolfsgrund	43.36	FFH
2519301	Wollingster See mit Randmoor	133	FFH
2723331	Wümmeniederung	8578.95	FFH
2820402	Wümmewiesen bei Fischerhude	1688	VSG

Appendix E – Maps

Map 1: Artificial and heavily modified surface waters in Lower Saxony

Map 2: Ecological status/potential of surface waters in Lower Saxony

Map 3: Ecological status/potential of surface waters in Lower Saxony
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Lower Saxony contribution
to the management plans 2015 to 2021
for the Elbe, Weser, Ems and Rhine river basins
pursuant to Section 118 of the Lower Saxony Water Act
and Art. 13 of the EU Water Framework Directive

Map 1

Artificial and heavily modified surface waters in Lower Saxony

Data was 10.10.2014

Legend

Lakes, transitional waters and coastal waters

- natural water bodies (NWB)
- heavily modified water bodies (HMWB)
- artificial water bodies (AWB)

Flowing waters

- natural water bodies (NWB)
- heavily modified water bodies (HMWB)
- artificial water bodies (AWB)

River basin

- Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2015 LGLN

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Map 2

Ecological status/potential of surface waters in Lower Saxony

Overall assessment

Data was 10.08.2015

Legend

Natural lakes, transitional waters and coastal waters

Ecological status

- high
- good
- moderate
- poor
- bad

Heavily modified lakes, transitional waters and coastal waters

Ecological potential

- good
- moderate
- poor
- bad

Artificial lakes, transitional waters and coastal waters

Ecological potential

- good
- moderate
- poor
- bad

Natural flowing waters

Ecological status

- high
- good
- moderate
- poor
- bad
- unclassified

Heavily modified flowing waters

Ecological potential

- good
- moderate
- poor
- bad
- unclassified

Artificial flowing waters

Ecological potential

- good
- moderate
- poor
- bad
- unclassified

River basin

Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

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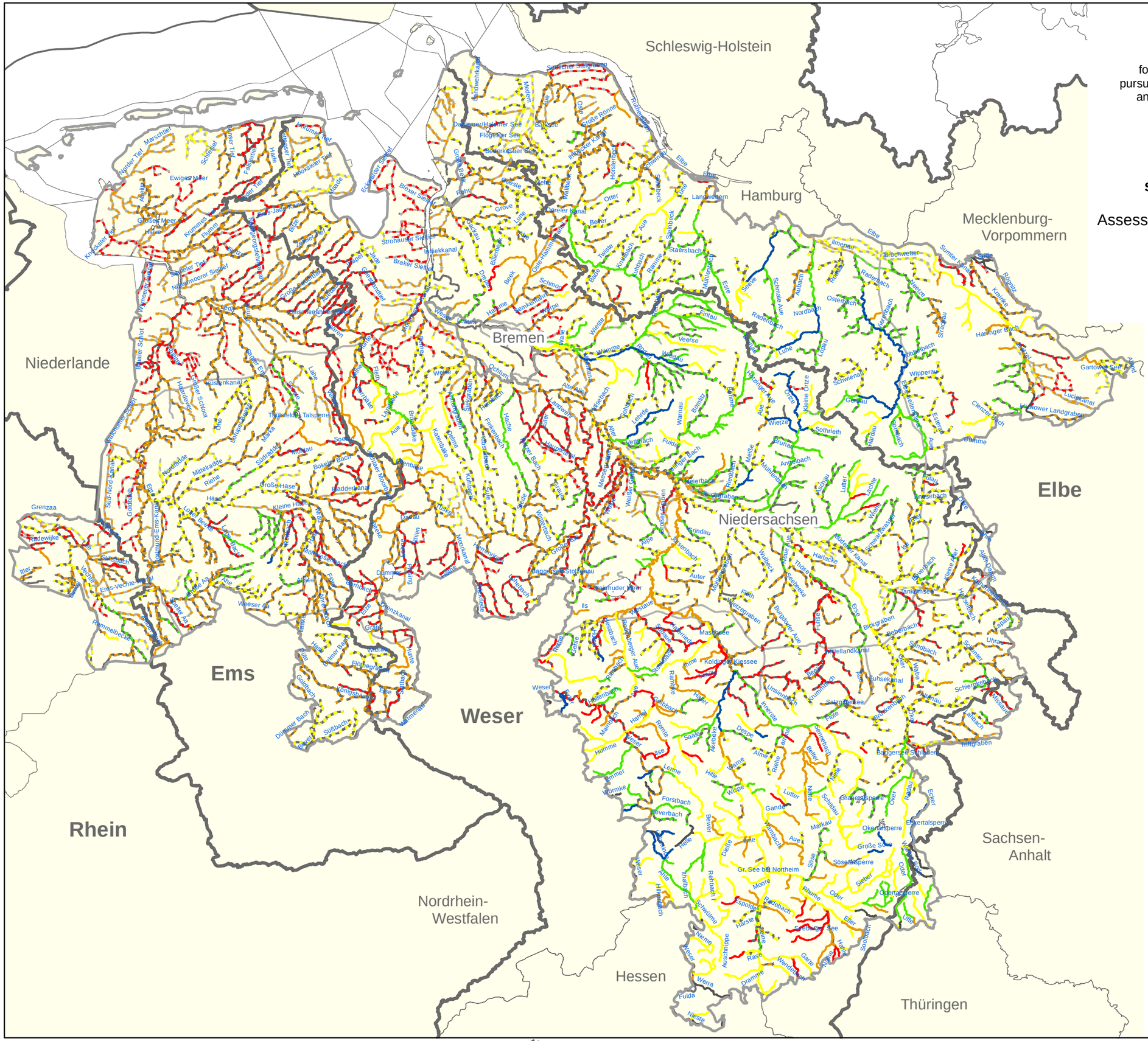
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Map 3

Ecological status/potential of surface waters in Lower Saxony

Assessment benthic invertebrates - degradation

Data was 10.02.2015



Legend

Natural water bodies
Assessment degradation
- high
- good
- moderate
- poor
- bad
- unclassified

Heavily modified water bodies
Assessment degradation
- good
- moderate
- poor
- bad
- unclassified

Artificial water bodies
Assessment degradation
- good
- moderate
- poor
- bad
- unclassified

River basin
- Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

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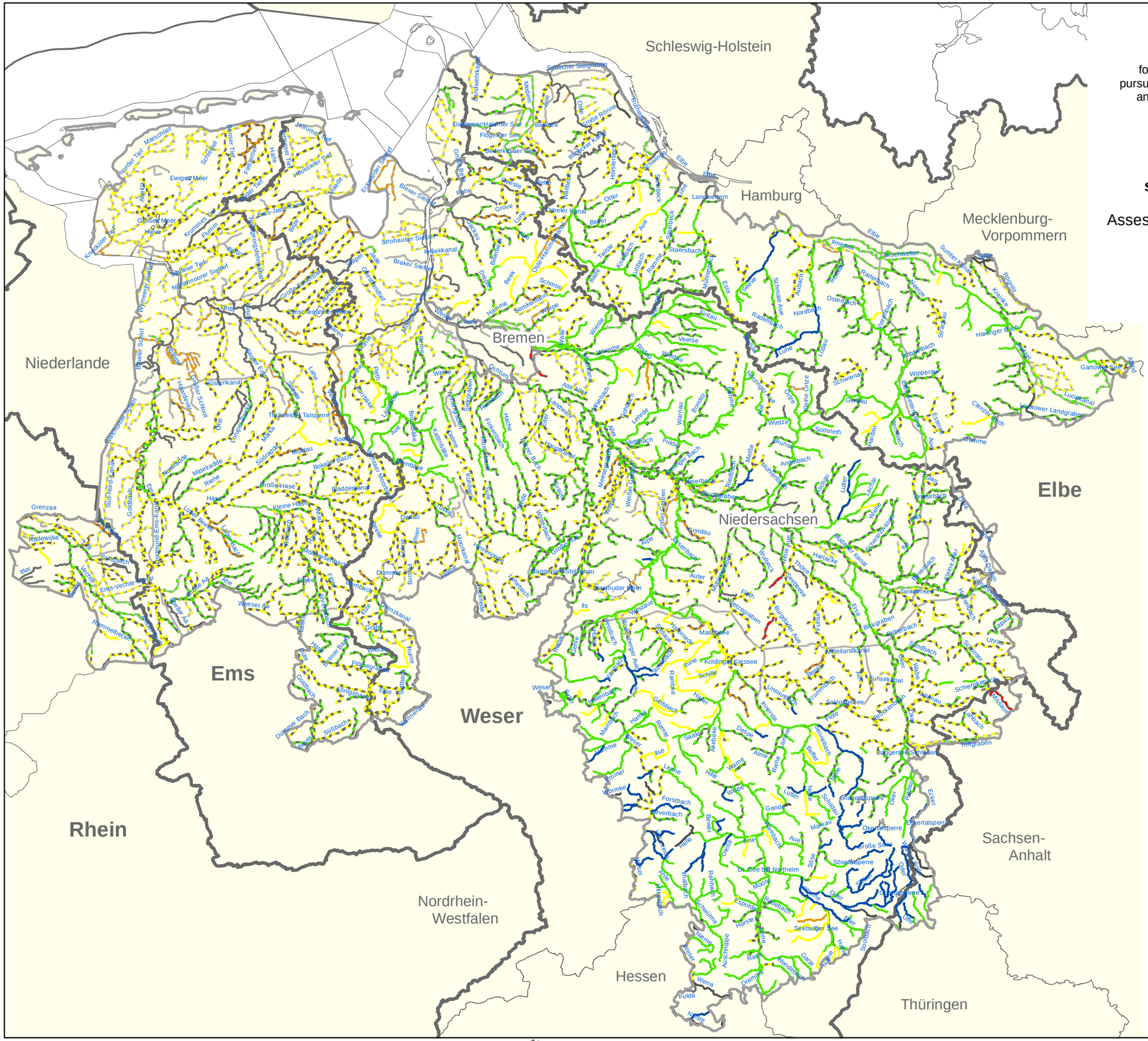
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Map 4

Ecological status/potential of surface waters in Lower Saxony

Assessment benthic invertebrates - saprobity

Data was 10.02.2015



Legende

Natural water bodies
Assessment saprobity
- high
- good
- moderate
- poor
- bad
- unclassified

Heavily modified water bodies
Assessment saprobity
- good
- moderate
- poor
- bad
- unclassified

Artificial water bodies
Assessment saprobity
- good
- moderate
- poor
- bad
- unclassified

River basin
- Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

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Map 5

Chemical status of surface waters in Lower Saxony

Assessment findings with mercury in biota

(Chemical assessment based on the Ordinance for the protection of surface water and Directive 2013/39/EU)

Data was 10.10.2014

Legend

Lakes, transitional waters and coastal waters
Chemical assessment
EQS (Environmental quality status) not satisfied

Flowing waters
Chemical assessment
EQS not satisfied

River basin
Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

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Map 6

Chemical status of surface waters in Lower Saxony

Assessment findings without mercury in biota
(Chemical assessment based on the Ordinance for the protection of surface water and Directive 2013/39/EU)

Data was 10.10.2014

Schleswig-Holstein
Hamburg
Mecklenburg-Vorpommern
Niedersachsen
Bremen
Niederlande
Elbe
Weser
Ems
Rhein
Nordrhein-Westfalen
Hessen
Sachsen-Anhalt
Thüringen

Legend

Lakes, transitional waters and coastal waters
Chemical assessment (measured)
- < 0.5 EQS (Environmental quality status)
- EQS satisfied
- EQS not satisfied
- > 2 EQS

Lakes, transitional waters and coastal waters
Chemical assessment (interpolated)
- < 0.5 EQS
- EQS satisfied
- EQS not satisfied
- > 2 EQS
- unclassified

Flowing waters
Chemical assessment (measured)
- < 0.5 EQS
- EQS satisfied
- EQS not satisfied
- > 2 EQS

Flowing waters
Chemical assessment (interpolated)
- < 0.5 EQS
- EQS satisfied
- EQS not satisfied
- > 2 EQS
- unclassified

River basin
- Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

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Map 7

Chemical status of surface waters in Lower Saxony

Assessment findings without ubiquitous substances
(Chemical assessment based on the Ordiance for the protection of surface water and Directive 2013/39/EU)

Schleswig-Holstein
Hamburg
Mecklenburg-Vorpommern
Niedersachsen
Bremen
Niederlande
Elbe
Weser
Ems
Rhein
Nordrhein-Westfalen
Hessen
Sachsen-Anhalt
Thüringen

Legend

Lakes, transitional waters and coastal waters
Chemical assessment (measured)
- < 0.5 EQS (Environmental quality status)
- EQS satisfied
- EQS not satisfied
- > 2 EQS

Lakes, transitional waters and coastal waters
Chemical assessment (interpolated)
- < 0.5 EQS
- EQS satisfied
- EQS not satisfied
- > 2 EQS
- unclassified

Flowing waters
Chemical assessment (measured)
- < 0.5 EQS
- EQS satisfied
- EQS not satisfied
- > 2 EQS

Flowing waters
Chemical assessment (interpolated)
- < 0.5 EQS
- EQS satisfied
- EQS not satisfied
- > 2 EQS
- unclassified

River basin
- Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

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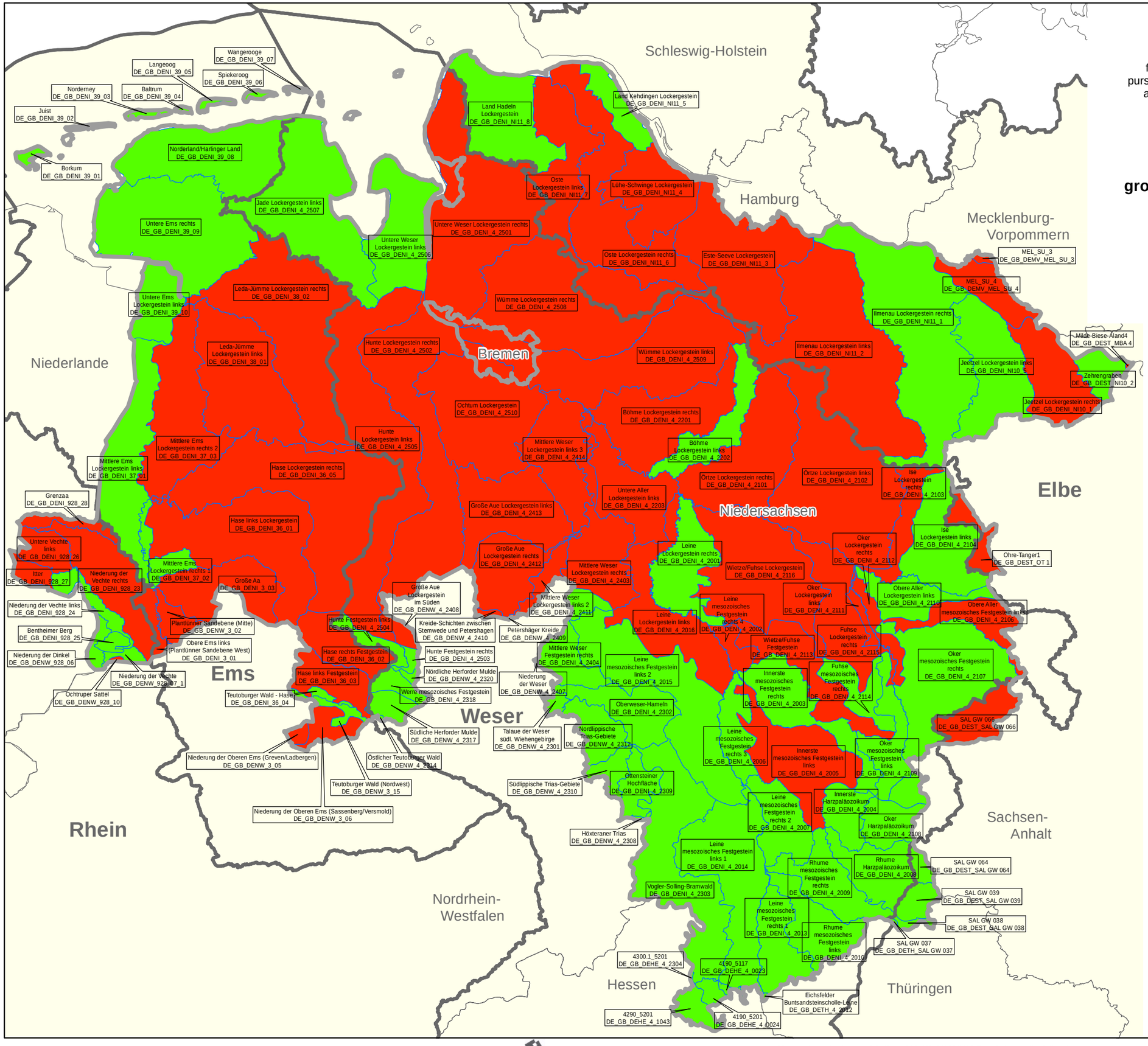
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Map 8

Chemical status of groundwater bodies in Lower Saxony

Overall assessment

Data was 10.08.2015



Legend

Groundwater bodies

Boundary groundwater bodies

Chemical status (overall assessment)

good

bad

River basin

Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

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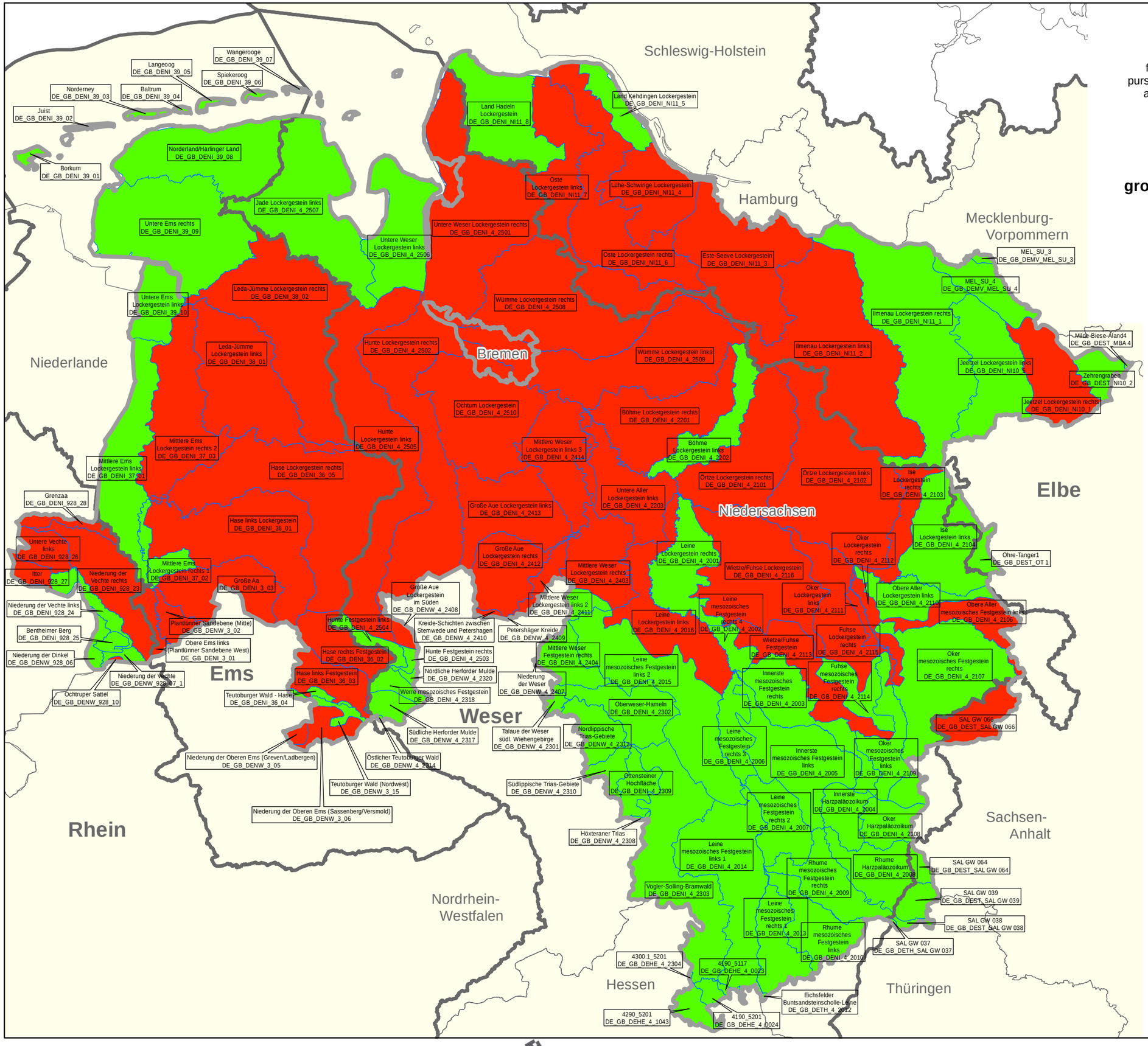
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Map 9

Chemical status of groundwater bodies in Lower Saxony

Nitrate

Data was 10.10.2014



Legend

Groundwater bodies

- Boundary groundwater bodies

Chemical status (nitrate)

- good
- bad

River basin

- Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

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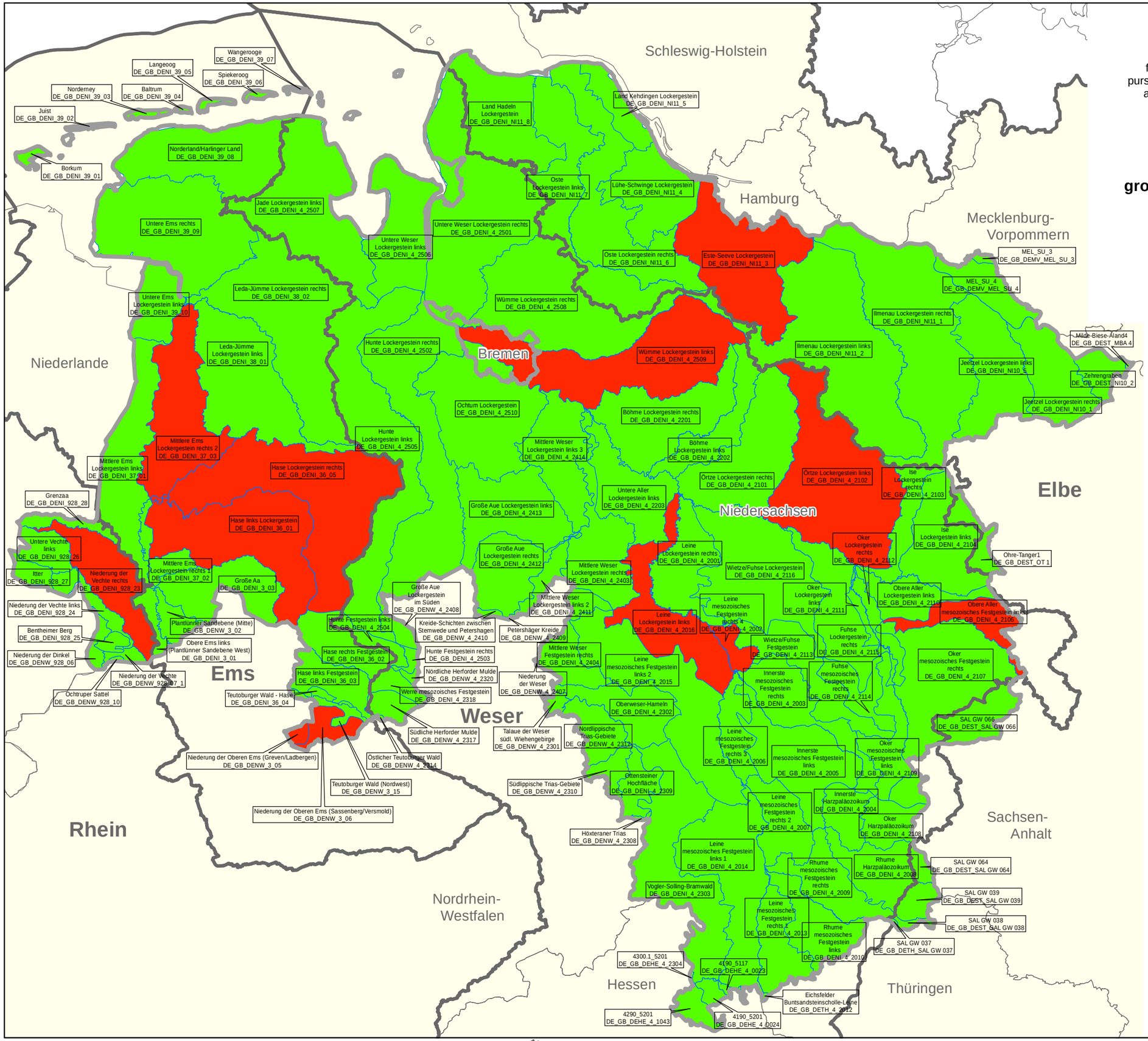
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Map 10

Chemical status of groundwater bodies in Lower Saxony

Crop protection agents

Data was 10.10.2014



Legend

Groundwater bodies

Boundary groundwater bodies

Chemical status (crop protection agents)

good

bad

River basin

Elbe, Weser, Ems, Rhein (Rhine)

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

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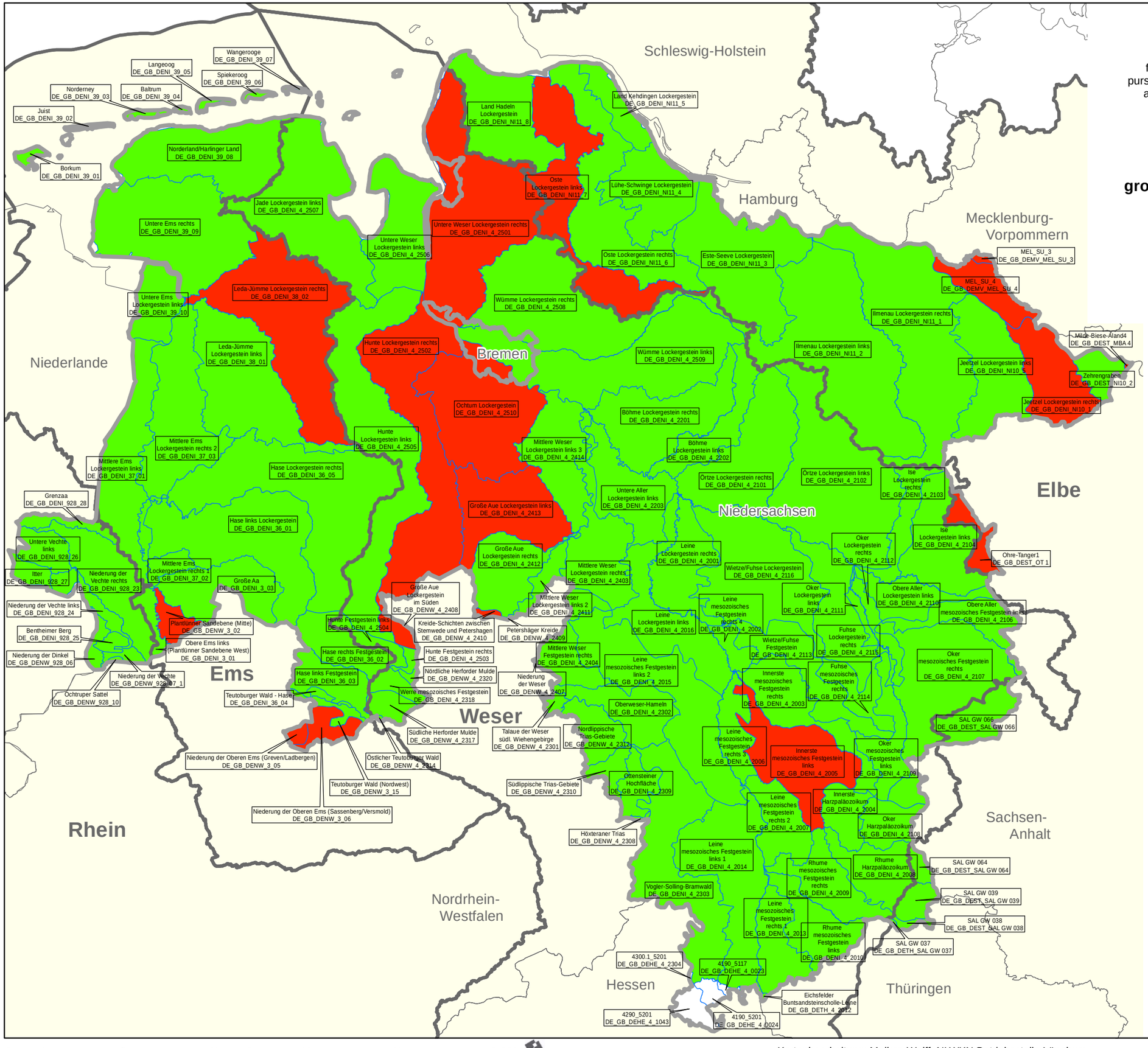
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Map 11

Chemical status of groundwater bodies in Lower Saxony

Other pollutants

Data was 10.10.2014



Legend

Groundwater bodies

Chemical status (other pollutants)

- good
- bad
- unclassified

River basin

- Elbe, Weser, Ems, Rhein (Rhine)

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

Quelle: Auszug aus den Geobasisdaten der Niedersächsischen Vermessungs- und Katasterverwaltung, © 2014 LGLN

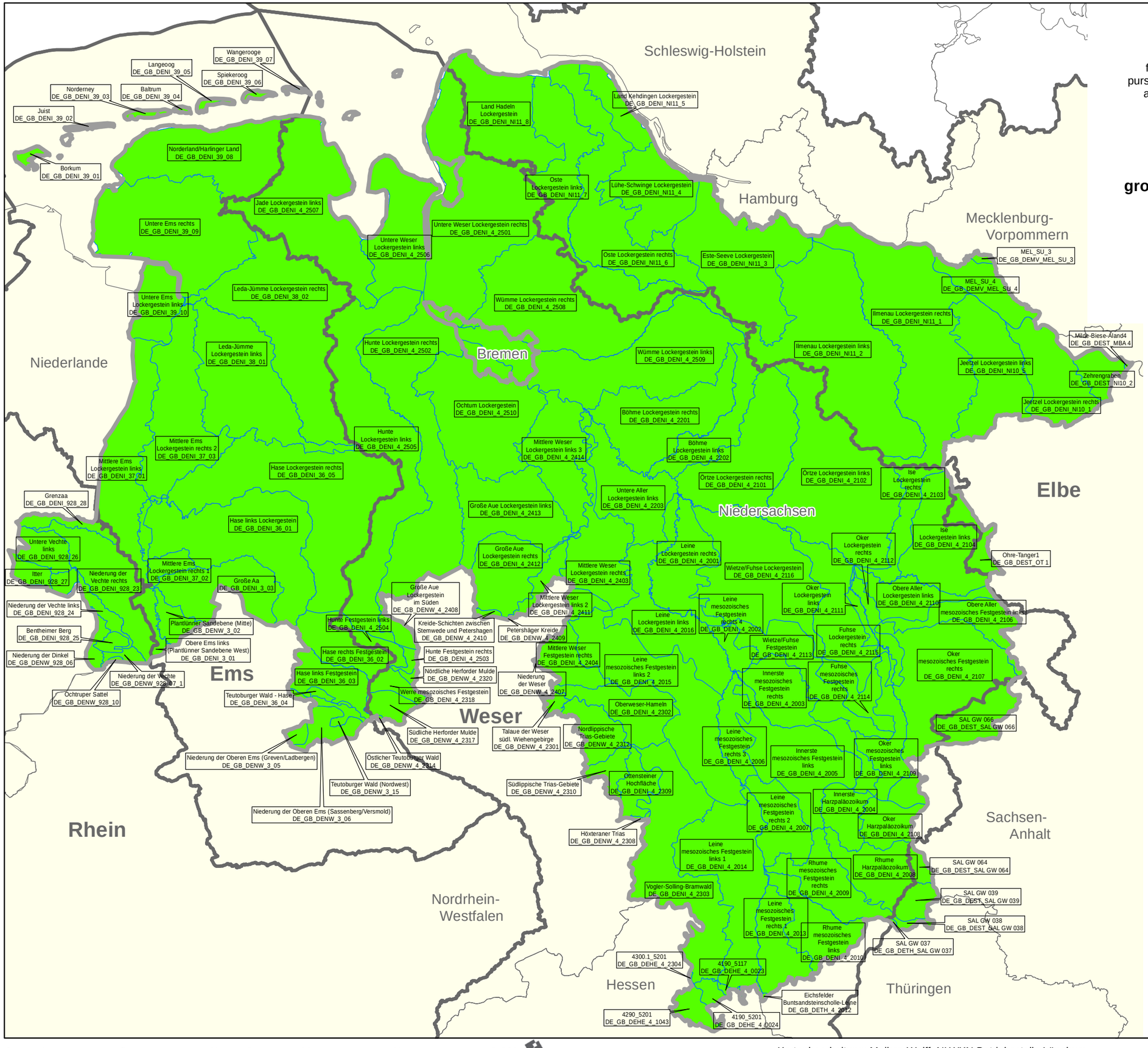
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Map 12

Quantitative status of groundwater bodies in Lower Saxony

Data was 10.10.2014



Legend

Groundwater bodies

- Boundary groundwater bodies

Quantitative status

- good
- failing to achieve good

Flussgebiet

- Elbe, Weser, Ems, Rhein

0 10 20 30 40 50 kilometers

Scale 1:1.100.000

Niedersachsen

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