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AZOV SEA RIVER BASIN MANAGEMENT PLAN 2025-2030

CONTENTS

The maps of the Azov Sea River Basin Management Plan for 2025-2030 are attached as a separate file in .PDF format.

LIST OF ABBREVIATIONS

AWB – artificial water body
BOD – Biochemical Oxygen Demand
BUWR – Basin Water Resources Administration
CEA – cost-effectiveness analysis
CMU – Cabinet of Ministers of Ukraine
COD – Chemical Oxygen Demand
EEA – European Environment Agency
EQS – environmental quality standards
EU – European Union
GDP – gross domestic product
GRP – gross regional product
GVA – gross value added
GWB – groundwater body
HMWB – heavily modified water body
LLC – Limited Liability Company
LOQ – limit of quantification
ME – municipal enterprises
MENR – Ministry of Environmental Protection and Natural Resources of Ukraine
NEURC – National Energy and Utilities Regulatory Commission
NNP – natural native park
NRF – Nature Reserve Fund
OSCE – Organization for Security and Co-operation in Europe
PE – population equivalent
PJSC – Public joint stock company
PoM – programme of measures
RBD – river basin district
RBMP – river basin management plan
REPF – Regional Environmental Protection Funds
ROWR – regional office of water resources
SAWR – State Agency of Water Resources of Ukraine
SE – state enterprises
SEF – State Environmental Fund
SEI – State Environmental Inspectorate of Ukraine
SES – State Emergency Service
SFRD – State Fund for Regional Development
STPs – sewage treatment plants
SWB – surface water body
SWMI – significant water management issue
TLV – threshold limit value
TOT – temporarily occupied territories
TPP – Thermal Power Plant
VAT – Value Added Tax
WFD – Water Framework Directive

1 GENERAL CHARACTERISTICS OF SURFACE AND GROUNDWATER

1.1. Description of the river basin

1.1.1. Hydrographic and water management zoning

The Azov Sea River Basin area is located within Luhansk, Donetsk, Zaporizhzhia and Kherson oblasts.

The catchment area of the basin's rivers is 37,878 km^2 . The basin covers 6.3% of Ukraine's territory.

The hydrographic network of the Azov RBD includes 121 rivers with a catchment area of more than 10 km^2 and 11 lakes with a catchment area of more than 0.5 km^2 .

1.1.2. Climate

The climate of the basin is temperate continental with pronounced droughts, with long, dry and hot summers with many sunny days. Winters are short, snowy, mild with periodic and frequent thaws.

The average annual temperature is 12°C, the coldest month is January with an average temperature of 7°C, and the warmest month is August with an average temperature of +25.3°C. The minimum recorded temperature in Luhansk region is 42°C, and the maximum recorded temperature in Zaporizhzhia and Kherson regions is 42°C (Table 1).

The highest precipitation falls in the highest part of the basin within the Donetsk Ridge and amounts to 550 mm per year, while the lowest precipitation is in the flat steppe part of the basin in Zaporizhzhia and Kherson regions and does not exceed 300 mm.

The prevailing winds in the basin are east and north-east with a frequency of up to 50%.

Table 1. Average long-term values of climate indicators

January	February	March	April	May	June	July	August	September	October	November	December	year
air temperature,° C												
-7,0	-4,2	6,2	18,8	21,8	23,0	24,1	25,3	19,0	11,0	5,3	-1,1	12,0
relative air humidity,%.												
89	88	85	73	67	56	50	53	68	78	87	90	74
rainfall, mm												
34	42	42	33	22	17	12	8	20	21	33	40	341

1.1.3. Relief

The basin's topography is characterised by a ruggedness to the east of the Donetsk Ridge and a gradual levelling off to the west across the Azov Upland and Azov Lowland to the Black Sea Lowland. Absolute elevations range from 362 metres in Luhansk Oblast to -0.4 metres on the Azov Sea coast in Donetsk, Zaporizhzhia and Kherson Oblasts.

In the far east, the relief is determined by the presence of the Donetsk Ridge. It is formed by thick layers of sedimentary rocks from the ancient seas that once existed here. The most characteristic feature of the ridge's relief is the alternation of hilly watersheds with deep, steeply sloping river valleys and dry gullies. Towards the Mius and Nagolna rivers valleys, the Donetsk Ridge slopes down, and the southern slopes turn into the Azov coastal plain.

The relief of the basin within the eastern part is predominantly flat (up to 200 m high), dissected by ravines and gullies. To the north-east is the Donetsk Ridge, whose surface is cut by river valleys. In the south, the ridge passes into the Pryazovian lowland with some elevations (Mohyla-Honcharykha, Savur-Mohyla, etc.). Further south, there is a narrow strip of the Pryazovian lowland, which drops off to the Sea of Azov with ledges. Karst landforms develop in the areas of limestone and saline deposits. A characteristic feature of the relief is the presence of forms of anthropogenic origin: spoil heaps, quarries, etc.

The surface within the central part of the basin is poorly dissected by rivers and gullies, and the plain slopes slightly from north-east to south-west. In the southeast, the Azov Upland (200 - 220 metres above sea level) is clearly visible, hilly in places, with deep valleys. Ancient crystalline rocks (granites and gneisses) lie here, which come to the surface in river valleys, ravines and gullies. Remnants of crystalline rocks in the watersheds rise in the form of single hills, the so-called graves, which are 300 metres or more high (Grave Tokmak - 307 m, Grave Belmak - 324 m, Grave Korsak - 133 m, and others). To the south, towards the Sea of Azov, to the southeast and to the west, the Azov Upland gradually decreases and turns into the Black Sea Lowland.

In the southern part of the basin, the relief is characterised by shallow, closed, drainless depressions (pitches), including: Domuzlyansky sub, Velykyi Agaymansky sub, into which shallow gullies flow drying few rivers. The coastline of the Sivash Bay is very rugged.

1.1.4. Geology

The Pryazovia river basin is located within three geological structures: the Donetsk folded structure, the Ukrainian Shield and the Black Sea Basin.

The Donetsk folded structure was formed as a result of the Hercynian folding at the site of a subgeosynclinal trough that was actively developing from the late Middle Devonian to the early Early Permian. The Donetsk folded structure is a synclinorium and is composed of sedimentary, mainly Paleozoic sediments resting on a crystalline basement. The Devonian sediments are represented by sandstones, mudstones, limestones, gypsums, anhydrites and effusive rocks up to 3.5 thousand metres thick. The section of the coal system is represented by three sections. The Middle and Upper Carboniferous sandstone, mudstone and siltstone strata with a thickness of 15-18 thousand metres with layers and interbeds of hard coal and limestone prevail. Mesozoic Upper Cretaceous sandy-clay and carbonate rocks (up to 600 m) occur on the periphery of the Donetsk structure. Paleogene and Neogene sediments are of limited distribution, while anthropogenic sediments are almost continuous (loess loams, sandy loams, sands), with a thickness of 20-30 m.

The Ukrainian Shield is an uplifted block of crystalline basement rocks bounded by discharge systems, a major positive structure of the East European Platform. The Ukrainian Shield within the Azov River Basin is represented by the Azov Megablock. In its section, two structural floors are distinguished. The lower floor is composed of metamorphosed dislocated rocks of Archean-Proterozoic igneous and metamorphic formations, while the upper floor is composed of low-thickness sediments of the Meso-Cenozoic, which are often eroded in river valleys.

The Black Sea Basin is separated from the Ukrainian Shield by a fault system. Its basement dips to the south and south-west. The basement rocks in this part are overlain by Mesozoic (Lower and Upper Cretaceous) and Cenozoic (Paleogene and Neogene) rocks. The most interesting hydrogeological features are the carbonate and terrigenous deposits of the Neogene, which increase in thickness to the south. Older formations of the Cimmerian-Alpine structural floor lie at considerable depths.

1.1.5. Hydrogeology

The territory of the basin belongs to three hydrogeological regions: Donetsk hydrogeological fold region, Ukrainian Shield hydrogeological region and Black Sea artesian basin.

Structurally, the Donetsk hydrogeological fold area is confined to the central part of the Donbas fold structure (Donbas) with a Hercynian (Paleozoic) basement, which is a synclinorium.

Groundwater in the Pryazovia river basin is mainly associated with Quaternary, Neogene, Paleogene, Cretaceous, coal and Devonian sediments. The Donbas is a system of syncline and anticline structures, where the natural conditions for the formation of groundwater resources are complex, and these conditions are further complicated by man-made interference. All of this creates a peculiar picture of aquifer recharge and discharge, which is often determined by the impact of the drainage system of a particular mining enterprise.

In general terms, all sedimentary cover deposits containing aquifers can be divided into two layers. The lower layer in the Azov Sea basin comprises aquifers in Carboniferous, Devonian and Lower Cretaceous sediments, which are characterised by impeded water exchange. The upper floor - aquifers in Quaternary to Paleogene and Late Cretaceous sediments - belong to the zone of intensive water exchange. The upper floor horizons are hydraulically interconnected, are fed mainly by infiltration of precipitation, and are drained by a gully and river network.

Two structural layers are distinguished in the hydrogeological region of the Ukrainian Shield. The lower floor is composed of metamorphosed dislocated magmatic and metamorphic formations of the Archean-Proterozoic, and the upper floor is composed of sedimentary deposits of the Meso-Cenozoic. The crystalline rocks are characterised by very uneven endo- and exogenous fracturing in area and depth. The most waterlogged zones are confined to the developed hydrographic network and large gullies. The thickness of intense fracture zones often does not exceed 20 m from the surface of crystalline rocks in watersheds and 50 m in river valleys, and usually extends to a depth of 80-100 m from the present-day surface. The aquifers of the upper structural layer, mainly in sandy sediments, are characterised by an uneven distribution and thickness, most often confined to watershed areas and eroded in river valleys.

The hydrogeological conditions of the Black Sea artesian basin are complex. This is due to the diversity and uneven distribution of both water-bearing and water-resistant sediments, facies and lithological variability of rock composition, and the diversity of groundwater quality.

Within the Pryazovia river basin, groundwater of drinking quality is found in sandy Quaternary, Pliocene, mainly carbonate Miocene sediments, Paleogene, Lower and Upper Cretaceous formations.

1.1.6. Soils

The soil cover in the basin is extremely heterogeneous due to a diverse combination of soil formation factors, including climatic conditions, bedrock, different relief conditions, and flora and fauna. The basin is divided into three soil-ecological zones, which are characterised by different types of natural environment in general. The main criterion is the typical composition of the soil structure - the Northern Steppe (NSP) zone, mainly within Donetsk and Luhansk oblasts; Southern Steppe (SS) and Dry Steppe (DS) - Zaporizhzhia and Kherson oblasts.

The areas of distribution of certain subtypes of zonal soils due to differences in the redistribution of solar energy and moisture within the zones are determined by four soil-ecological subzones. Within the Pryazovia River Basin region, subzones are distinguished in the Northern Steppe zone: North-Central Moderately Arid Steppe (NCMS-2) and South-Central Arid Steppe (SCMS-3); the Southern Steppe zone is not divided into subzones; the Dry Steppe zone is divided into the Dry Steppe Subzone (DSZ-1) and the Very Dry Steppe Subzone (VDSZ-2).

In the Northern Steppe zone, on the territory of the PSPnC-2 sub-zone, common medium and low humus chernozems on loess rocks and sod soils on eluvium of non-carbonate and carbonate rocks prevail. Locally, deep medium- and low-humus chernozems are found.

On the slopes of the southern exposure, where the upper horizons of loess loams have been washed away, the soil-forming rocks are Permian clays.

On the slopes of gullies and river valleys, as well as in the Azov Upland, where the loess rock layer has been partially or completely washed away, sod soils have formed.

Low-humus chernozems are common in the upper reaches of the Krynka and Mokryi Yelanchyk rivers and along the Kalmius and Kalchyk rivers.

Within the eastern part of the basin, the PSPdC-3 sub-zone is dominated by ordinary low-humus chernozems, with small areas of sod-sand and clay-sand soils.

In Donetsk Oblast, landslides are predominantly located on the Azov Sea coast.

In the Southern Steppe zone, the basin is dominated by southern low-humus chernozems and southern low-humus residual-saline chernozems on loess rocks.

Southern low-humus chernozems are found on flat, poorly drained wide watersheds and their slopes. These soils are fairly homogeneous in texture, mostly clayey and heavy loamy. They are characterised by a well-developed soil profile with a darkish grey colour. The soils are quite fertile and high effective fertility can be achieved with adequate moisture and the application of organic and mineral fertilisers.

The main soil type in the Dry Steppe zone within the basin in the PSSC-1 sub-zone is dark chestnut low humus residual saline on loess rocks; in the PSSC-2 sub-zone, it is chestnut saline.

Dark chestnut residual slightly to moderately saline soils occur in a complex manner: in the northern part of the region - in combination with southern residual saline black soils, to the south - with deep saline soils and in the extreme south - with chestnut saline soils and salts.

Dark chestnut saline soils have a fairly clear differentiation of soil profile into humus-eluvial and humus-illuvial horizons.

Chestnut soils are common in the seaside and Sivash parts of the site, which is a plain with a developed microrelief and a noticeable slope to the south. These soils are heterogeneous in terms of their mechanical composition, ranging from sandy loam to heavy loamy soils. The soil-forming rocks are loess and loess-like loams. The profile of chestnut soils is sharply differentiated into eluvial (structureless), lighter in texture, and illuvial, which is more compacted and contains a significant amount of silt particles. The dense illuvial horizon has the ability to retain moisture from penetrating into the lower soil horizons, it is structureless, floats when wet, and forms a crust when dry.

On the lowland plain territory of Zaporizhzhya and Kherson regions within the Azov River basin, there are common foothills characterised by meadow-chernozem saline, meadow-chernozem gleyey saline-saline soils. In the river floodplains, there are meadow-chernozem, meadow surface-saline, and meadow-marsh saline soils.

1.1.7. Flora

According to the geobotanical zoning of Ukraine, the Azov sea river basin is located in the Black Sea-Azov sub-province of the Pontic Steppe Province of the Steppe sub-region (zone) of the Eurasian Steppe Region within four geobotanical districts (Table 2).

Table 2. Geobotanical zonation of the Azov Sea River Basin

Eurasian steppe region		
Steppe sub-region (zone)		
Pontic steppe province		
Black Sea-Azov steppe sub-province		
District	Name of the district	District boundaries in the basin
33	Donetsk forest-steppe district of oak forests, meadow and grass-cereal and petrophytic steppes	The catchment area of the Mius River
40	Pryazovskii district of grass and cereal steppes and vegetation of granite outcrops	From the Mius River to the Obitochna River
39	Dnipro-Azov district of cereal and wormwood-cereal steppes and suburban meadows	From the Obitochna River to the western boundary of the basin without the coast of the Utliutskyi estuary and Sivash Bay
41	Prysyvashsky district of wormwood-grass steppes, salt marshes and salt marshes	The coast of the Utliutskyi estuary and the Sivash Bay

The Pryazovia River Basin area is a treeless territory, with natural forests remaining only in the valley of the Mius River and some of its tributaries. The natural ravine forests consist of oak, poplar, willow, elderberry, and zinovat. Other small forest plantations of artificial origin include white and yellow acacia, scumpia, Tatar maple, and silver olive.

The steppe areas that are not built up with settlements and industrial facilities have been completely ploughed up, and steppe vegetation has been preserved on some unploughed floodplains that were used for grazing.

1.1.8. Fauna

According to the zoogeographical zonation, the basin belongs to the Azov-Black Sea region of the Pontic District of the Steppe Province of the Mediterranean-Central Asian subregion of the Paleoarctic region (Table 3).

Table 3. Zoogeographical zonation of the Azov Sea river basin

Palearctic region	
Mediterranean-Central Asia sub-region	
Steppe province	
Pontus district	
Azov and Black Sea region	
Name of the plot, subplot	Boundaries of the site on the territory of the basin
Donetsk subdivision	Mius and Krynka rivers, upper Kalmius River
Western steppe (Azov) area	The entire territory of the basin except for the Donetsk subdivision and the coast of the Azov Sea with the Sivash Bay
Syvash-Pryazovsk sub-section of the Azov-Black Sea area (river valleys and sea coasts)	The coast of the Azov Sea with the Sivash Bay

The fauna of the river basin is represented by forest, steppe, river and marine species. Red foxes, grey hares, and Urgentine mice are found almost everywhere in the area, and birds include grey partridge, grey crow, hoopoe, larks, swallows, sparrows, and woodpeckers.

In addition to the above-mentioned species, some species migrating from other regions are also common in the gullies in the north of the basin and in the river floodplains.

1.1.9. Hydrological regime

The rivers of the basin belong to the group of rivers with spring floods. By the nature of the spring flood, they are of the Eastern European type, characterised by high spring floods, low summer and winter low water levels and increased late autumn runoff due to rainfall.

According to the hydrological zoning, the basin's territory is classified as a water scarcity zone in the Plain part of Ukraine (Table 4).

Table 4. Hydrological zonation of the Azov Sea river basin

Plain part of Ukraine		
3. Zone of insufficient water availability		
Area.	**Area name**	**Boundaries of the region within the basin**
3-2	Siverskodonetsk-Dnipro region of insufficient water supply	Mius, Krynka and Kalmius river basins
3-4	The Azov region has insufficient water content	From the state border, Kalmius River, except for the upper reaches to the Utliutskyi estuary
3-3	Black Sea region of extremely low water availability	From the Utliutsk basin estuary to the western boundary

Observations of the hydrological regime in the basin on the territory of Zaporizhzhia and Donetsk oblasts (according to the State Water Cadastre). Long-term data on the regime and resources of land surface waters for the entire observation period) were collected at 26 observation sites.

In the Pryazovia basin, the rivers originate at an altitude of 120 to 250 m above sea level. As a result, in the upper reaches they have a noticeable drop and an average slope of more than 10 m/km. For the rest of the distance, these are typical flat watercourses (the lowest slope is 0.1 m/km), mostly with calm, smooth flow, well-defined morphological features such as meanders, spits, spits, asymmetric river valley profiles, etc., and a weighted average slope of 4.5 m/km across the basin. V-shaped valleys predominate, with some watercourses (Krynka, Kalmius) having box-shaped or indistinct valleys (Gruzkyi Elanchyk). The width of the valleys varies from 0.2 - 0.8 km in the upper reaches (Mius, Krynka, Mokryi Elanchyk rivers) to 3.5-6 km in the lower reaches (Mius, Molochna, Berda, Kalchyk, Mokra Volnovakha rivers). The length of the rivers varies from 258 km (Mius) and 209 km (Kalmius) to several kilometres.

The height of the slopes varies similarly: from 2-10 m in the upper reaches to 30-50 (90) m in the lower reaches. The right slopes are mostly steep and high, while the left slopes are gentle. The width of the floodplain varies from 50-100 m in the upper reaches to 1.5-3 km near the mouth. On some rivers (Kalchik), the floodplain is present only near the mouth. During the spring floods, it is flooded with a layer of water ranging from 0.8-1.5 to 2-3 m high. The rivers are winding, especially in the lower reaches. The average width of the riverbed is 3-10 m (upper reaches); depth ranges from 0.2-0.5 to 5 m.

The current velocity is low, mostly 0.2-0.3 m/s; at low water on most rivers it is close to 0; during spring floods it is 0.5-0.8 m/s. Exceptions are the upper reaches of the Mius, Krynka and other rivers, where the flow rate varies between 0.5-1.2 m/s. Some rivers (Mokryi Yelanchyk, Sadky) dry up in some places or completely every year, and some (Kalchyk) only once every 5 years, or even less often - once every 40-50 years (Berda), while the western rivers are permanently dry. The river bottoms are sandy or muddy; in the upper reaches of the rivers flowing from the slopes of the Donetsk ridge (Mius, Krynka), they are rocky on the rifts, and in some areas sandy and pebbly. The right bank is mostly higher than the left bank.

In the Azov Sea region, there is a decrease in the density of the river network from east (2.3) to west (0.1 km/km^2). Other indicators of the hydrological regime are also changing: water discharge - from 8.29 (Kalmius) to 0.08 m^3 /s (Tashchenak); runoff volume - from 261.4 to 2.5 million m^3 /year; runoff module - from 3.0 to 0.2 l/s km^2 ; runoff coefficient - from 0.15 to 0.02; runoff volume with 50 % availability - from 125.9 to 1.2 million m^3 ; runoff volume with 95 % availability - from 46.1 to 0.44 million m^3 ; sediment discharge from 0.34 to 0.004 kg/s; sediment discharge from 10.8 to 0.11 t/year.

River freezing begins in the third decade of December, and ice cover forms only in the basins of the Mius, Krinka and Kalmius rivers; other rivers do not have permanent ice cover. Ice melting begins in mid-February, and scouring and clearing takes place by mid-March.

1.1.10. Specifics of the river basin

All major rivers in the basin flow southwards. The basin has transboundary waters, in particular: The Mius River, out of 258 km of its length, flows through Ukraine for only 90 km from its source; its tributaries, the Vilkhovchik, 153 and 21.6 km, respectively, and the Krynka, 180 and 155 km; the Mokryi Elanchik River flows through Ukraine for 14 km out of 105 km, its tributary, the Sukhyi Elanchik, 77 and 19.4 km; another tributary, the Pavlivska River, flows through Ukraine partially from 10 to 5 km of its channel; the Hirka River, a tributary of the Hruzkyi

Elanchyk, flows out and into the main river on the territory of our country, but twice enters the territory of the neighbouring country (the Russian Federation).

In recent decades, the basins of most rivers in Ukraine, including the Northern Azov Sea, have been considered exclusively from a consumer perspective. The maximum absorption of the watershed was driven by the need to produce agricultural products, while riverbeds were used for energy, water transport and as a wastewater intake. Surface water quality is usually assessed from a consumer perspective. This approach has resulted in a significant overload of the natural buffer capacity of the aquatic environment, deterioration of its self-purification capacity, and phenomena inherent in the environmental crisis - massive cases of intestinal infectious diseases, fish freezing, and deterioration of water consumption characteristics, primarily drinking water.

Many rivers flowing into the Sea of Azov or its estuaries do not have a direct mouth, but form their own small estuaries (Atmanai, Tashchenak, Lozovatka, etc.). At the same time, their salinity reaches 11,000-14,000 mg/dm^3. Naturally, the salt content in river waters increases from the source to the mouth, but due to geological features, its content in the source is at least 1,500 mg/dm^3.

Rivers within the Kherson region do not flow anywhere at all, ending in the drainless territory of suburbs (Domuzlyansky, Velykyi Ahaimansky).

A freshwater aquifer runs under Arabatska Strilka at a depth of 15-30 metres. The artesian water forms an underground lake (one of 3 in Ukraine), which is part of the North Crimean artesian water deposit. The absence of nitrates and nitrites in the water makes Arabat artesian water unique and its properties are comparable to Bonakva table water, one of the cleanest in Ukraine.

Thus, the recreational area of the Genichesk district is one of the best health and wellness areas in the world in terms of its natural properties.

The Pryazovia river basin includes a part of the 66.93 km-long Kakhovka main canal and distribution canals.

In addition to small estuaries of small rivers, the Sea of Azov has large transitional waters: Molochnyi estuary, Utliutskyi estuary, Syvash Bay, where the salinity ranges from 22‰ to 260‰.

The Sea of Azov with its bays serves as the main river of the Azov basin: Utliutska, Obitochna, Berdiansk, Bilosarayska and Taganrogska, which form the coastal waters of the basin.

1.1.11. Typology of surface water bodies

The SWB typology was developed in accordance with the Methodology for Determining Surface and Groundwater Bodies (Methodology) approved by the Order of the Ministry of Ecology and Natural Resources No. 4 dated 14.01.2019 to detail the hydrographic zoning of Ukraine, prepare a state water monitoring programme, and develop and evaluate the effectiveness of the RBMP implementation.

The Azov Sea RBD defines SWBs for five categories of surface waters - rivers, lakes, artificial and heavily modified surface water bodies, transitional and coastal waters.

For the typology and delineation of rivers and lakes, the EU WFD system A was used (Table 5, Table 6).

Table 5. Descriptors for rivers (system A)

Descriptors		
Catchment height, m	Catchment area, km^2	Geological rocks
• midlands: over 800 • lowlands: 500 - 800 • upland: 200 - 500 • lowland: < 200	• small: 10 - 100 • average: >100 - 1000 • Large: >1 000 - 10 000 • very large: > 10 000	• limestone • silicate • organic

Table 6. Descriptors for lakes (system A)

Descriptors			
Catchment height, m	Average depth, m	The area of the water mirrors, km^2	Geological rocks
• upland: 200 - 500 • lowland: < 200	• shallow: <3 • average in depth: 3 - 15 • deep: >15	• small: 0,5 - 1 • average: 1 - 10 • large: 10 - 100	• limestone • silicate • organic

The EU WFD system B is used for the typology of SWBs in the categories of "transitional waters" and "coastal waters".

For "transitional waters", in addition to ecoregion and salinity, an additional indicator is used among the mandatory descriptors - origin (Table 7). This indicator, as an additional descriptor, was included following the example of Romania and Bulgaria.

Table 7. Descriptors for transitional waters (system B)

Eco-region	Salinity, ‰	Origin.
• Black Sea • Sea of Azov	• oligohaline 0.5 to < 5 • mesogastric 5 to < 18 • polygamous 18 to < 30 • euryhaline < 40	• seaside • estuaries are open • estuaries are closed

For "coastal waters", in addition to the ecoregion and salinity, additional indicators are used: exposure (protection from waves and wind), and the predominant composition of bottom sediments (Table 8).

Table 8. Descriptors for coastal waters (system B)

Eco-region	Salinity, ‰	Exposition	Bottom deposits
• Black Sea • Sea of Azov	• desalinated < 0.5 • oligohaline 0.5 to <5 • mesogastric 5 to <18 • polygamous 18 to <30 • euryhaline 30 to <40	• protected (bays, bays) • Open (cape zones, direct coastline)	• clay-silt • silty sandy • sandy

The Azov sea RBD is located within two ecoregions - the Pontic Province (number 12) and the Eastern Plains (number 16).

According to the catchment area, the rivers of the basin are classified as small (with a catchment area of less than 100 km^2), medium (from 100 to 1000 km^2) and large (from 1000 to 10,000 km^2) rivers.

According to the height of the catchment area, the rivers of the basin are located on uplands (from 200 to 500 m) and lowlands (less than 200 m).

The basin's geological rocks are of two types: limestone (Ca) and silicate (Si).

In the category of "rivers", 12 types of SWBs were identified (Table 9).

Table 9. Types of SWBs in the "rivers" category

№	Type code	Type
1	UA_R_12_S_1_Si	a small river in the lowlands in silicate rocks
2	UA_R_12_S_2_Si	a small river on a hill in silicate rocks
3	UA_R_12_M_1_Si	medium-sized river in the lowlands in silicate rocks
4	UA_R_12_L_1_Si	a large river in the lowlands in silicate rocks
5	UA_R_16_S_1_Ca	a small river in the lowlands in limestone rocks
6	UA_R_16_S_1_Si	a small river in the lowlands in silicate rocks
7	UA_R_16_S_2_Ca	a small river on a hill in limestone rocks
8	UA_R_16_S_2_Si	a small river on a hill in silicate rocks
9	UA_R_16_M_1_Ca	medium-sized river in the lowlands in limestone rocks
10	UA_R_16_M_1_Si	medium-sized river in the lowlands in silicate rocks
11	UA_R_16_L_1_Ca	a large river in the lowlands in limestone rocks
12	UA_R_16_L_1_Si	a large river in the lowlands in silicate rocks

In the category of "lakes", 4 types of SWBs were identified (Table 10).

Table 10. Type of SWBs in the "lakes" category

№	Type code	Type
1	UA_L_12_S_1_SH_Si	a small lake in the lowlands is shallow in silicate rocks
2	UA_L_12_M_1_SH_Si	the middle lake in the lowlands is shallow in silicate rocks
3	UA_L_12_L_1_SH_Si	a large lake in the lowlands is shallow in silicate rocks
4	UA_L_16_M_1_SH_Si	the middle lake in the lowlands is shallow in silicate rocks

In the category of "transitional waters", 6 types of SWBs have been identified (Table 11).

Table 11. Types of SWBs in the "transitional waters" category

№	Type code	Type
1	UA_TW_M6_P_C	Polygynous closed estuaries
2	UA_TW_M6_E_O	Euryhaline open estuaries
3	UA_TW_M6_E_C	Euryhaline closed estuaries
4	UA_TW_M6_M_C	Mesohaline closed estuaries
5	UA_TW_M6_P_O	Polygynous open estuaries

№	Type code	Type
6	UA_TW_M6_H_C	Euryhaline open estuaries

4 types of SWBs of the "coastal waters" category have been identified (Table 12).

Table 12. Types of SWBs in the "coastal waters" category

№	Type code	Type
1	UA_CW_M6_M_EX_S_SS	Mesogaline protected shallow silty sandy soils
2	UA_CW_M6_M_EX_S_CS	Mesohaline protected shallow clay-silt soils
3	UA_CW_M6_M_SH_S_CS	Mesogaline open shallow clay-silt
4	UA_CW_M6_M_SH_S_SS	Mesogaline open shallow silty-sandy

1.1.12. Reference conditions

The assessment of the ecological state of the SWB is based on a comparison of biological indicators (benthic macroinvertebrates, macrophytes, phytobenthos, phytoplankton and fish) with reference conditions that characterise the state of the SWB, which has not been subjected to anthropogenic impact or is minimal.

Reference conditions are determined on the basis of data obtained from reference sites, by modelling (predictive models or retrospective forecasting methods that take into account historical, paleogeographic and other available data that provide a sufficient level of confidence in the values for reference conditions for each type of SWB) or by a combination of these methods or based on expert opinion.

In order to establish reference values for biological indicators based on data from reference sites, it is necessary to establish such sites for each type of SWB in all natural categories. The network should cover a sufficient number of sites to provide a sufficient level of confidence and to account for the variability of values for indicators that correspond to the different ecological status of the SWB type.

Key criteria for selecting reference sites:

- characterise the state of the SWB without anthropogenic impact or with minimal impact,
- there is no industry or intensive agriculture,
- concentrations of specific synthetic pollutants are zero or below the detection limits,
- no morphological changes,
- water intake and flow control cause only minor fluctuations in water levels and do not affect surface water quality,
- the vegetation of the coastal zone is appropriate for the type of SWB and geographical location,
- no invasive species,
- fishing and aquaculture do not affect the functioning of the ecosystem.

In accordance with paragraph 2 of clause VII of the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 5 dated 14.01.2019 "On Approval of the Methodology for Assigning a Surface Water Body to One of the Classes of Ecological and Chemical Status of a Surface Water Body, as well as Assigning an Artificial [...]", type-specific reference conditions may also be determined on the basis of existing reference sites in other countries for the same type of SWB or by combining the procedures described above.

Given that reference conditions for all types of SWBs are not currently defined in Ukraine, it was suggested to use the reference conditions established for the same or similar types in neighbouring EU countries, namely the Slovak Republic and Romania.

The methodology includes four hydrobiological indicators (benthic macroinvertebrates, phytoplankton, phytobenthos, macrophytes, macroalgae and eutrophication, respectively) for four natural categories of surface waters (rivers, lakes, transitional waters and coastal waters) that have been identified in Ukraine.

The environmental quality standards (EQS) were approved by Order of the Ministry of Ecology No. 332 dated 01.04.2024 "On Approval of Environmental Water Quality Standards for Determining the Ecological Status of Surface Water Bodies and Amendments to Certain Regulatory Acts".

In the second cycle of the RBMP, it is necessary to revise the reference conditions (including for the fish fauna indicator) using data from state water monitoring.

1.2. Water bodies delineation

1.2.1. Surface water

In the Azov Sea RBD, the SWBs were determined on 121 rivers and 11 lakes (according to the State Water Cadastre: Accounting of Surface Water Bodies geoportal of the State Agency of Water Resources of Ukraine).

Within the Azov Sea RBD, 555 SWBs have been identified. The identified SWBs belong to the following categories of surface water:

- rivers,
- lakes,
- artificial (AWB) and heavily modified (HMWB),
- transitional waters,
- coastal waters.

Category "rivers"

According to the Methodology, 326 SWBs were identified. The number of identified SWBs by descriptors and types is shown in Tables 13 and 14.

Table 13. Distribution of SWBs of the "rivers" category by descriptors

Descriptor	Indicator.	Number of SWBs
by eco-region	Pontic province	113
	Eastern plains	213
by catchment area	small(S)	205
	average(M)	109
	large(L)	12
by the height of the catchment area	in the lowlands	286
	on a hill	40
by geological type	in silicate rocks	192
	in limestone rocks	134

Table 14. Distribution of SWBs of the "rivers" category by type

№	Type code	Type	Number of designated SWBs
1	UA_R_12_S_1_Si	a small river in the lowlands in silicate rocks	52
2	UA_R_12_S_2_Si	a small river on a hill in silicate rocks	3
3	UA_R_12_M_1_Si	medium-sized river in the lowlands in silicate rocks	54
4	UA_R_12_L_1_Si	a large river in the lowlands in silicate rocks	4
5	UA_R_16_S_1_Ca	a small river in the lowlands in limestone rocks	64
6	UA_R_16_S_1_Si	a small river in the lowlands in silicate rocks	49
7	UA_R_16_S_2_Ca	a small river on a hill in limestone rocks	33
8	UA_R_16_S_2_Si	a small river on a hill in silicate rocks	4
9	UA_R_16_M_1_Ca	medium-sized river in the lowlands in limestone rocks	33
10	UA_R_16_M_1_Si	medium-sized river in the lowlands in silicate rocks	22
11	UA_R_16_L_1_Ca	a large river in the lowlands in limestone rocks	4
12	UA_R_16_L_1_Si	a large river in the lowlands in silicate rocks	4

Category "lakes"

Eleven SWBs have been identified (Table 15) in the Azov Sea RBD.

Table 15. SWBs of the "lakes" category

№	Type code	Type	Quantity defined SWBs
1	UA_L_12_S_1_SH_Si	a small lake in the lowlands is shallow in silicate rocks	1
2	UA_L_12_M_1_SH_Si	The middle lake in the lowlands is shallow in silicate rocks	8
3	UA_L_12_L_1_SH_Si	a large lake in the lowlands is shallow in silicate rocks	1
4	UA_L_16_M_1_SH_Si	The middle lake in the lowlands is shallow in silicate rocks	1

Category "transitional waters"

12 SWBs have been identified in the Azov sea RBD (Table 16).

Table 16. Types of SWBs in the "transitional waters" category

№	Type code	Type	Number of designated SWBs
1	UA_TW_M6_P_C	Polygynous closed estuaries	4
2	UA_TW_M6_E_O	Euryhaline open estuaries	2
3	UA_TW_M6_E_C	Euryhaline closed estuaries	4
4	UA_TW_M6_M_C	Mesohaline closed estuaries	1
5	UA_TW_M6_P_O	Polygynous open estuaries	1

Category "coastal waters"

Eight SWBs have been identified in the Azov Sea RBD (Table 17).

Table 17. Types of SWBs in the category "coastal waters"

№	Type code	Type	Number of designated SWBs
1	UA_CW_M6_M_EX_S_SS	Mesogaline protected shallow silty sandy soils	4
2	UA_CW_M6_M_EX_S_CS	Mesohaline protected shallow clay-silt soils	2
3	UA_CW_M6_M_SH_S_CS	Mesogaline open shallow clay-silt	1
4	UA_CW_M6_M_SH_S_SS	Mesogaline open shallow silty-sandy	1

The category "heavily modified water bodies".

A total of 182 HMWBs have been identified in the basin. The share of HMWBs in the total number of SWBs in the Azov Sea RBD is 33%. The bulk (163 SWBs) are classified as HMWBs due to overregulation.

5 SWBs are classified as HMWBs due to straightening.

14 SWBs are classified as straightening due to a combination of regulation and channel straightening (Fig. 1).

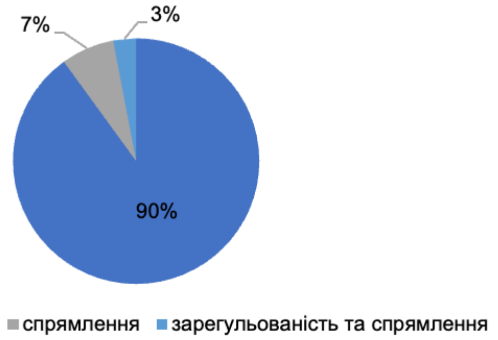


Figure 1 Distribution of HMWBs by causes of hydromorphological pressures (%)

Category "artificial surface water bodies".

In the Azov sea river basin, 16 AWB have been identified, including 5 canals and 11 inflow reservoirs and ponds.

The percentage distribution of the identified SWBs in the Azov Sea RBD by category is shown in Figure 2.

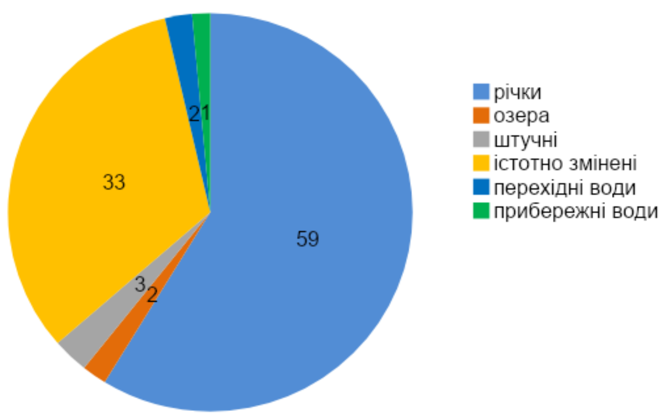


Figure 2 Breakdown of identified SWBs by category (%)

Each of the 555 SWBs identified in the Azov Sea RBD has been assigned a unique code that looks like this:

UA_M6.9_YYYY

- UA-Ukraine;
- M6.9 - code of the Azov Sea RBD (according to the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 103 of 29 March 2017 "On Approval of the Boundaries of River Basin Areas, Sub-basins and Water Management Areas");
- *YYYY is the unique* number of the designated SWBs in the Azov sea RBD.

Each linear SWB (of the categories "rivers", "AWB or HMWB") has a length (km). The length of the SWBs in the Azov Sea RBD varies from 0.3 km (UA_M6.9_0397 - Hruzka River) to 137.1 km (UA_M6.9_0439 - Krynka River).

Figure 3 shows the distribution of the identified linear SWBs in the Azov Sea RBD by length.

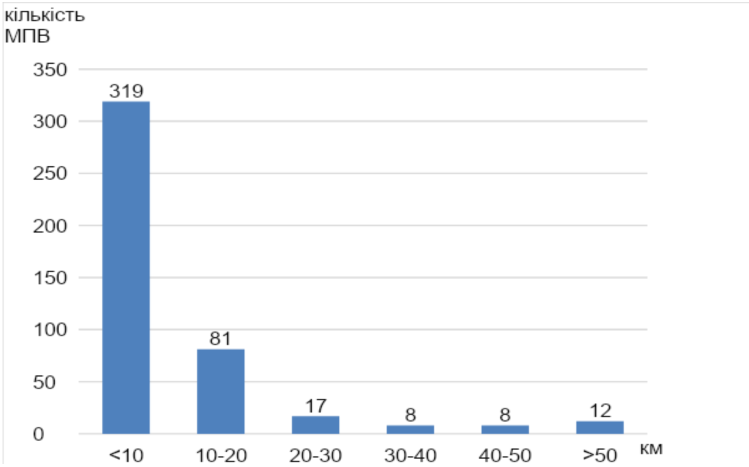


Figure 3 Distribution of the identified linear SWBs by length

Each polygonal SWB (categories "lakes", "AWB or HMWB", "transitional waters", "coastal waters") has an area (km^2). The area of the SWB in the Azov RBD ranges from 0.1 km^2 (UA_M6.9_0406 - Verbovske Reservoir) to 1,751.5 km^2 (UA_M6.9_0554 - coastal waters of the Azov River Basin area).

Figure 4 shows the distribution of the identified polygonal SWBs in the Azov Sea RBD depending on the area.

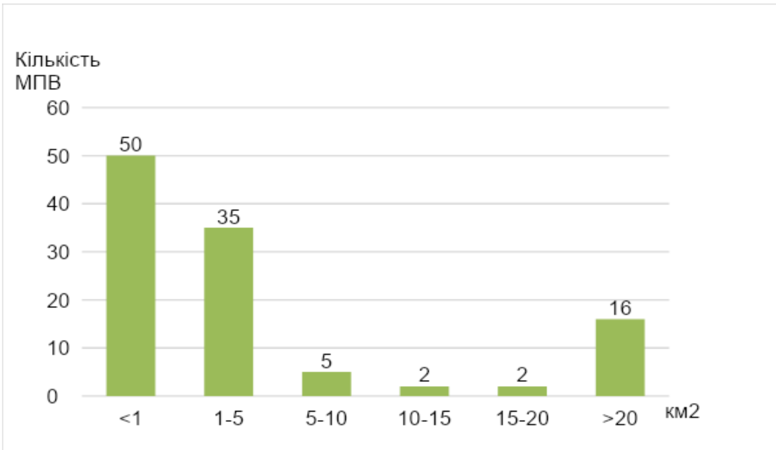


Figure 4 Distribution of identified polygonal SWBs by area

1.2.2. Groundwater

The deliniation of the GWBs was carried out in accordance with the Methodology for Determining Surface and Groundwater Bodies (Methodology) approved by the Order of the Ministry of Ecology and Natural Resources No. 4 dated 14.01.2019.

The definition of an GWBs includes the division of aquifers into smaller units, the preliminary establishment of GWBs boundaries based on individual characteristics and available knowledge of hydrogeological systems and anthropogenic impacts.

The definition begins with the analysis of geological maps and well data to identify different hydrogeological units within the aquifer. First of all, attention is paid to those aquifer complexes whose reserves can provide water intake of more than 10 m3 per day.

The youngest aquifers are considered first. As a rule, the boundaries of surface water basins are approximated with the boundaries of groundwater basins, and then the determination of the GWBs for deeper aquifer complexes, the boundaries of which go beyond the boundaries of surface water basins, is performed.

The codes of the defining GWBs are formed as follows:

UAM6900Q100

- UA - Ukraine,
- M69 is the code for the Azov River Basin,
- 0 - river sub-basin, according to the Water Code,
- 0Q - geological system (geological age of water-bearing rocks),
- 100 - the number of the GWB.

In the Azov Sea river basin, 13 groups of GWB and 2 GWB have been identified, including 3 groups of GWB and 1 GWB in non-pressure aquifers (Table 18), and 10 groups of GWB and 1 GWB in pressure groundwater aquifers (Table 19).

Table 18. Groups of non-pressure GWB

Combined code of the GWB group	GWB groups	Area of the GWB, km^2
UAM6900Q100	Group of GWB in alluvial quaternary sediments	2752,0
UAM6900Q200	Group of GWB in marine and estuarine sediments	117,0
UAM6900Q300	GWB in deluvial estuarine and marine sediments	80,56
UAM6900Q400	A group of GWB in aeolian-deluvial Quaternary sediments	18630,0

Table 19. Pressure GWB and groups of pressure GWB

Unified code of the GWB	GWB	Area of the GWB, km^2
UAM6900N200	Group of GWB in Pliocene terrigenous sediments	661,2
UAM6900N100	A group of GWB in Upper Miocene terrigenous carbonate sediments	22700
UAM690PG100	Group of GWB in Paleocene and Eocene sediments	1106,9
UAM690PG200	A group of GWB in Buchach terrigenous sediments of the Eocene	92400
UAM6900K300	Group of GWB in terrigenous deposits of the Upper Cretaceous (Molochna River basin)	1161
UAM6900K200	Group of GWB in terrigenous deposits of the Upper Cretaceous (Krynka River basin)	577,4
UAM6900K100	Group of GWB in Lower Cretaceous terrigenous sediments	1356
UAM6900C200	Group of GWB in the sandy-clayey strata of coal deposits	6305
UAM6900C100	Group of GWB in the Lower Carboniferous limestone-dolomite formation	186,97
UAM6900D100	GWB in Devonian sediments	156,1
UAM690AR100	Group of GWB in the fracture zone of crystalline rocks of the Archean-Proterozoic	10380

The characteristics of the GWBs groups are presented in Annex 2.

Group of GWBs in alluvial quaternary sediments (UAM6900Q100)

The group is distributed in the basins of the Molochna, Berda, Kalmius, Kalchyk, Mius, Krynka rivers, as well as the Azov Sea coast in the form of bands in alluvial deposits of floodplains, the first to fifth floodplain terraces and alluvial-deluvial deposits of beam bottoms cut into the bedrock.

It is distributed in continuous or discontinuous strips cut into bedrock, ranging in width from several metres to 0.5 km in the hydrogeological region of the Ukrainian Shield. In the Black Sea artesian basin, the aquifer lies on Neogene sediments. In the Kalmius River valley, it is distributed as a strip up to 2.4 km wide. In the valleys of the Mokra and Sukha Bilosaraika, Komyshuvatka and Zelena rivers, the aquifer is overlain by eluvial-deluvial sediments. The groundwater mirror is tilted from the bedrock slopes to the valleys.

The thickness of the waterlogged sediments varies from 0.5-1 to 8-10 m, and in the valleys of large rivers reaches 20-30 m. The depth of the groundwater table ranges from 1 to 20 m and depends on the terrain and the position of the water table.

The chemical composition of the water is sodium-calcium-magnesium sulphate or sodium chloride sulphate or with a mixed cationic composition and salinity from 0.9 to 7.9 g/dm^3.

The chemical composition of groundwater is quite variable, although there is a pattern of significant increase in the salinity of the aquifer in the area of Lake Sivash, where the water type becomes chloride.

In other areas, the water may have a chloride-sulfate, sulfate, chloride-hydrogen carbonate, hydrogen carbonate-chloride or even hydrogen carbonate composition. The cationic composition of waters is magnesium-calcium, sodium-calcium-magnesium, magnesium-sodium. The waters are usually neutral, from moderately to very hard (hardness from 6.2 to 65.4 mmol/dm^3). In terms of salinity, the waters range from fresh to brackish, with salinity ranging from 0.6 to 10.1 g/dm^3, with values of 1-3 g/dm^3 prevailing. Alluvial waters in some parts of the Krynka and Kalmius river valleys have the lowest salinity (up to 1.0 g/dm^3) and calcium-bicarbonate composition.

Group of GWBs in marine and estuarine sediments (UAM6900Q200)

The group is distributed on the Berdiansk and Bilosaray Spits (Black Sea artesian basin) and along the Azov Sea coast within the modern sea beach, and in the Berdy River delta. The group of GWBs is confined to Lower Neopleistocene marine sediments, Holocene marine and estuarine marine sediments, and Holocene aeolian sediments.

The water-bearing rocks are represented by multi-grained sands with silt layers, carbonate loams with silt layers and clayey sands, which are based on pebbles and gravels of crystalline rocks. The sediments are up to 43 m thick. On the Berdiansk Spit, the aquifer is covered by aeolian sandy deposits; deeper inland, marine and estuarine deposits are overlain by aeolian and aeolian-deluvial loams of the Neopleistocene. The aquifer is located on the sediments of the ninth to tenth terraces.

The aquifer is unconfined. The waters of the aquifer have a free surface of the mirror with a depth of 0.0 to 3.8 m. The aquifer is characterised by a specific flow rate of 0.007 to 1.2 dm^3/s, with wells flowing at 9.1 dm^3/s at a water table of 7.4 m. Rock filtration coefficients vary widely from 0.01 to 10.2 m/d. The predominant groundwater type is sodium chloride and mixed. Mineralisation varies widely from 3.1 to 44 g/dm^3. It mainly contains saline waters close to the composition of seawater, on which lenses of fresh water lie. In a number of settlements on the spits, these lenses are exploited by single wells with a flow rate of 0.2-0.3 dm^3/s to supply water to local residents. Due to the shallow depth of the wells and low water withdrawal, there is no saltwater inflow. Their chemical composition is diverse, ranging from calcium bicarbonate to sodium chloride with salinity from 0.9 to 4.4 g/dm3 and total hardness from 5.3 to 27 mmol/dm^3. The aquifer's regime depends on meteorological factors and the level regime of the Azov Sea.

GWB in aeolian-deluvial and lake sediments (UAM6900Q300)

The group of GWBs in aeolian-deluvial lacustrine Lower-Upper Pleistocene sediments of closed basin-floors was assigned the code UAM6900Q300. The aquifer has an island distribution along the coast of Lake Syvash and on the watershed plain. The groundwater is confined to silted loams and sandy loams with thin layers of differently grained sand alternating with clays along the section. The horizon thickness ranges from 4-6 to 10-20 m.

According to hydrogeological conditions, the podes are divided into two groups: 1) podes with a shallow groundwater table on the regional aquifer; 2) podes with a significant groundwater table on the local aquifer. The first group includes the ponds mainly located in the southwestern part of the territory, with a groundwater depth of 1.5-5 m, sometimes reaching 10-13 m. The groundwater of the ponds is hydraulically connected to the waters of the Aeolian-Deluvial deposits. The common aquifer for them is Upper Pliocene clay. The second group includes the ponds monitored in the northern part of the territory with a water table depth of 15-20 m. The aquifer here is the heavy loam of the ponds themselves.

The water content of the horizon is usually very low. Well flow rates are 0.002-0.05 dm^3/s at water levels of 0.5-2.0 m. Filtration coefficients vary from 0.1-0.5 m^3/d, rarely 5-8 m^3/d.

The chemical composition of groundwater is varied. There are chloride-sulfate, sulfate-chloride, sulfate-hydrocarbonate, hydrocarbonate, and hydrocarbonate-chloride waters. The cationic composition is dominated by magnesium-sodium waters. Water salinity ranges from 0.8-1 to 15 g/dm^3. The predominant value is over 3 g/dm^3. The water hardness ranges from moderately hard to very hard (7-67 mmol/dm^3). Increased mineralisation is observed in the pitches with shallow groundwater depth, which is associated with the intensification of continental salt accumulation processes under conditions of intensive evaporation.

Aquifers are recharged by infiltration of rain and melted snow water, for which the ponds are catchment basins. In the absence of surface recharge, the groundwater level in the ponds drops sharply.

Groundwater in the subsoil is used by the local population mainly for household purposes and livestock watering, and only in extreme cases for drinking.

A group of GWBs in aeolian-deluvial Quaternary sediments (UAM6900Q400)

The group is distributed throughout the entire watershed (except for the slopes of beams and river valleys) in the basins of the Molochna, Berda, Kalmius, Kalchyk, Mius rivers and the Azov Sea coast.

At the base of the water-bearing rocks are single-aged heavy loams or, as a rule, red-brown clays. Their depth ranges from 1 to 10-20 m.

Water-bearing rocks are represented by aeolian-deluvial and eluvial-deluvial loams, sandy loams, loess-like loams. Their depth ranges from 1.0 to 10-20 m and up to 46 m within the Black Sea artesian basin. In the presence of water-resistant rocks among the sediments, the horizon takes the form of a water table. The thickness of the waterlogged rocks is from 0.5 to 4 m, rarely up to 15-20 m. Loams have low water content. Depth of groundwater level is 2-15 m from the ground surface. The deposits included in the group of the UAM6900Q400 are weakly water-bearing.

The waters of the GWBs may be hydraulically connected to the aquifers of the basin-pods and alluvial deposits, and in places where there are "windows" in the Pliocene clay aquifer, to the aquifer in the Akchagylian Pliocene.

The filtration characteristics of loess-like loams are usually low. The filtration coefficients of loams vary from 0.001 to 0.01 m/d, rarely amounting to 0.08-0.4 m/d. The coefficient of water conductivity is 0.22-0.32 m^2/d. The flow rate of springs is tenths of a m^3/h, and that of wells does not exceed 1 m^3/h. The water is mostly brackish and salty. The value of dry residue varies from 0.6 to 6-10 g/dm3, and the total hardness ranges from 6 to 50 mol/m3. The chemical composition of the water is mainly sodium sulphate, sulphate or magnesium sodium chloride-sulphate, and rarely bicarbonate.

The mineralisation and chemical composition of groundwater is significantly influenced by the degree of leaching and salt composition of loess and loam both in the waterlogged zone and in the aeration zone. The water of deluvial loams in the upper reaches of gullies, where the loams are better washed, has good drinking quality. Water with the highest salinity should be expected in drainless areas of the loess plains with a close water table to the daytime surface. The group of GWBs is widespread in the zone of insufficient moisture and, consequently, groundwater supply. In this part of the territory, the soils and rocks of the aeration zone are saline due to the natural process of continental salt accumulation. This causes an increase in salinity and deterioration of water quality. Here, evaporation in the capillary zone results in salinisation of not only groundwater but also soils, forming sulphate or mixed salt marshes.

Groundwater of the UAM6900Q400 GWBs group is not protected from contamination, often containing nitrites and nitrates up to 20-40 mg/dm^3. In areas of intensive fertiliser use and in built-up areas, their content increases to 170-220 mg/dm^3.

Infiltration feeding, the regime is characterised by pronounced seasonal fluctuations and depends on meteorological factors.

Due to its poor quality and low water enrichment, the groundwater in the horizon is of limited use.

Groundwater associated with aeolian-deluvial loams is used to meet the domestic drinking needs of individual households and to supply water to small farms. The aquifer is not of practical importance for the organisation of centralised water supply.

A group of GWBs in Pliocene terrigenous sediments (UAM6900N200)

The group is distributed as a wide strip of 7 to 20 km along the Azov Sea coast in the basins of the Molochna and Berda rivers and the Azov Sea coast.

The group of GWBs in Pliocene terrigenous sediments includes a complex of aquifers associated with Pliocene-Lower Eocene alluvial deposits of the ancient valleys of the ninth to tenth terraces (a10-9N2-EI), alluvial-marine deposits of the Akchagylian regional stage (N2ak) and deposits of the Lower Pliocene Kimmerian regional stage (N2km). In some areas, the boundaries of the aquifers coincide and they are exploited jointly. The delineation into separate IAPs will be possible subject to new expert data and more detailed study.

The aquifer in the Pliocene-Lower Eopleistocene alluvial deposits of the ancient valleys of the ninth to tenth terraces (a10-9N2-EI) is spread in a strip up to 16 km wide along the Azov Sea coast. The water-bearing rocks are represented in the upper part by loams and sandy loams with interlayers of clays and sands of different grain sizes, and in the lower part by sands with inclusions of pebbles and gravel. The thickness of the horizon varies from 1 m to 8 m in the north to 33 m in the south of its distribution. The depth of the aquifer cover is from 2.0 to 27.1 m. The horizon thickness is up to 32 m. The groundwater is low pressure, the head is 0.5-2.1 m. The flow rate of the springs ranges from 1.73 to 59.6 m3/d. The predominant type of groundwater is sulphate-chloride with mixed cationic composition. The aquifer is recharged by infiltration of precipitation, as well as by flow from the Akchagilian sediments at the northern boundary.

The groundwater in the horizon is used primarily for domestic purposes by means of non-stationary capture wells.

The aquifer in the alluvial-marine sediments of the Akchagylian regional layer (N2ak) is spread in a strip 7 to 20 km wide along the Azov Sea coast from the western border of the territory to Mariupol. It is absent in the area of the Berdy River floodplain and within the Bilosaray Spit. Near the northern border, it occurs in Precambrian crystalline rocks and their destruction products, and in the rest of the territory - in Cimmerian sandy-clayey rocks. The depth of the aquifer varies from 8.0 m in the northern parts of the distribution to 75.3 m on the coast. The thickness of the horizon varies from 5 m to 50 m, increasing towards the sea.

The water-bearing rocks are fine-grained sands with clay interbedded, while to the west of Pryazovske, the sands are predominantly clayey. As the sands approach the northern limit of their distribution, they become multigrained.

The water content of the horizon is unstable and varies over the area. The groundwater is pressurised and non-pressurised, with a piezometric level of 1-43 m. To the west of Pryazovske settlement, the wells usually do not exceed 72-96 m3/d, and to the east - 360-480 m3/d, in some areas it reaches 637 m3/d with a water table drop of 12-33 m, the filtration coefficient varies from 0.0003 to 15.6 m/d, with a predominant value of 3.3-4.7 m/d. The permeability of the rocks varies from 60 to 120 m2/d and averages 85 m2/d. Limited access to the daytime surface and occurrence of red-brown Pliocene clays under the water-resistant layer in most of the area partially limits its recharge by atmospheric precipitation. The chemical composition is dominated by bicarbonate-chloride-sulfate magnesium-calcium-sodium waters, mostly with a salinity of 1.1-2.9 g/dm3; northwest of Berdiansk (Lunacharske RPV), in small areas near Prymorsk and near Pryazovske, waters with a dry residue of 0.9-1.5 g/dm3 have been discovered. Sodium chloride brines with a mineralisation of 51 g/dm3 are less common.

The Akchagil aquifer is fed by infiltration of precipitation and by flow from the aquifers below.

The aquifer is exploited by group water intakes (Lunachar water intake, water intakes of Berdiansk, Prymorsk) and single wells (with a capacity of 25-100 m3/d) for water supply to farms, settlements, and various health resorts located on the Azov Sea coast. Within the framework of groundwater development with salinity of up to 2 g/dm3, the aquifer can be recommended for centralised water supply to small settlements with limited water withdrawal, as it is necessary to take into account the possibility of saline water recharge.

The aquifer is located in the Lower Pliocene Cimmerian sediments (N2km).

The aquifer is developed in the south of the territory, approximately within the same limits as the aquifer in the Akchagilian sediments described above. The aquifer is located in the Akchagylian sediments in the roof, and in the Berdy River valley - in alluvial Quaternary sediments. In most of the territory, it is located in the water-resistant strata of the Lower Sarmatian subregion or crystalline rocks of the Precambrian (in the north of the area), with the waters of which it is hydraulically connected. It is confined to the thickness of ferruginous sandstones ("tobacco stones") and clayey sands. The water-bearing sands are usually fine and fine-grained, while the sandstones are of various grains. The thickness increases from north to south from 0.5 m to 47 m, with an average thickness of 11 m. The horizon occurs at a depth of 12 - 74 m, increasing towards the watersheds and the sea. The horizon is a pressure horizon with a piezometric depth of 1-58 m and a head of 0.6 to 18.3 m.

The water content of the aquifer varies across the area and in different sections. It increases to the north and north-east due to improved filtration properties of the sands. Well production rates vary from 24 to 389 m3/d. Most of the wells have flow rates of 86-260 m3/d at 15-20 m depths.

The groundwater in the horizon is formed in worse conditions than those described above. The horizon has no outlets to the surface and is fed by water flow from the Akchagilian sediments and underflow from Precambrian rocks. In the Cimmerian deposits, groundwater is predominantly sulphate, sulphate-chloride, sodium chloride, and hard. The mineralisation is 0.8-12.0 g/dm3, and increases to 12-110 g/dm3 in the Molochnyi and Utliukskyi estuaries. Sulfate-chloride sodium-calcium waters with a salinity of 1.9-2.8 g/dm3 and a total hardness of 19.7-28.8 mmol/dm3 are developed in a narrow strip along the Azov Sea coast, with a slightly alkaline reaction.

However, due to the lack of better water, despite its poor quality, the groundwater in the horizon is exploited by single wells in a number of rural settlements of the Melitopol administrative district. The joint exploitation of aquifers in the Cimmerian and Akchagilian sediments is of practical interest.

A group of GWB in Upper Miocene terrigenous carbonate sediments (UAM6900N100)

The group is distributed in the Molochna and Berda river basins and on the Azov Sea coast.

The group of GWBs in Miocene terrigenous carbonate sediments includes a complex of aquifers associated with sediments of the Middle-Upper Sarmatian subregion (N1s2-3), Pontic (N1p) and Meotic (N1m) Miocene regional levels.

The aquifer in the Pontic sediments (N1p) is confined mainly to shell sandy limestone and quartz sand of various grains. The boundary of the aquifer runs from Pryshyb village along the right bank of the Molochna River to Tambovka village, then turns southwest in a semicircular shape, passes through Novomykolaivka village to Novhorodkivka, heading to Syvashske village in Kherson region. The aquifer is also locally distributed on the southern slope of the Pryazovian massif (on the slopes of the Berdy River, between the villages of Mykolaivka and Osypenko). The depth of water-bearing limestone ranges from 1 to 75 m. The total thickness varies from 1 to 25 m. The aquifer is characterised by low or no pressure. The depth of the pontic groundwater level ranges from

10-20 m to 25-35 m on the watershed plateau and up to 0-5 m in erosion cuts, on the slopes of which there are natural outlets in the form of springs and mochars. The wells have a flow rate of 16 to 252 m3/d with a decline to 10 m. The chemical composition of groundwater in most of the territory is sulphate and chloride, mixed in anionic and cationic composition, with a salinity of 1-3 g/dm3 or more. Only in the southeastern part, in a narrow area near the village of Terpinnya and Novomykolaivka, the chemical composition of water changes to a simpler chloride-hydrocarbonate magnesium-calcium type in the springs in the village of Terpinnya, calcium hydrogen carbonate-chloride, calcium chloride types in the wells of Novomykolaivka, where the water salinity is 1-2 g/dm3.

Pontic waters are used for water supply of some agricultural facilities in Vasylivskyi and Melitopol districts. The aquifer is not of practical importance for the organisation of centralised drinking water supply due to its insignificant resources and high salinity.

MWP in the sediments of the Middle-Upper Sarmatian subregion, Meotian and Pontic regions.

This aquifer complex is the main one and is developed throughout the basin, with the difference that in the north the Pontic deposits are drained and groundwater is confined only to the Sarmatian and Meotian deposits. This is a thick stratum of organogenic limestone with thin layers of marls and sands. Sands become dominant in the eastern part of the basin. The thickness of the aquifer varies from 5-10 m in the north to 200 m.

The roof of the aquifer complex is covered by waterlogged Quaternary and Pliocene sediments separated from it by a thickness of Cimmerian clays, in which more permeable areas remain, where hydraulic connection with the waters in the overlying sediments is possible. At the base of the complex, there are clays of the Lower-Middle Sarmatian Miocene subregion, which increase in thickness in the southeast direction up to 50 m. In the northern part of the basin, the thickness of the clays decreases to 2-5 m and they cease to be water-bearing, as a result of which the horizon forms a water-bearing complex with underlying aquifers.

The depth of the aquifer ranges from 3-4 m in the north-west to 100-150 m in the south-east. The groundwater is free-flowing in the northern part of the basin, with the head increasing to 120-130 m as the aquifer complex deepens. The depth of the groundwater level of the complex varies from 5-10 to 30-35 m.

The aquifer complex is highly enriched with water, which, together with satisfactory groundwater quality, makes it the main target aquifer complex in the region. The wells have flow rates of 1-25, with a maximum of 36.1 dm^3/s at a depth of 0.3-14 m. Limestone filtration rates are 30-480 m/d in the upper zone of intense fracturing, 2-6 m/d in the lower zone, and 10-15 m/d on average; for sands, the filtration rate varies from 0.01 to 5.7 m/d. The average annual discharge of the Mariupol water intake is 54.8 dm3/s. The water content of the sands is much lower. Well flow rates do not exceed 2-2.5 dm^3/s, and spring flow rates are 0.1-0.3 dm3/s. Formed in fractured, cavernous, well-consumed limestone, especially in river valleys where there are favourable conditions for water exchange (recharge by precipitation), the groundwater in the horizon is mostly of good quality.

The water salinity is 1-3 g/dm^3, but increases to 10 g/dm^3 near the island of Syvash. The chemical composition of waters with low mineralisation is hydrocarbonate, chloride-hydrocarbonate, hydrocarbonate-sulfate-chloride, calcium sulfate-chloride, magnesium-sodium or calcium-magnesium-sodium. Highly mineralised waters are sodium chloride. The aquifer complex is protected from surface pollution over most of its distribution area.

The aquifer is recharged by infiltration of precipitation and water flow from overlying aquifers and complexes. The main recharge area is located outside the basin, on the southern slopes of the Ukrainian Shield, and the local recharge area is the Kuchugur development area. Discharge occurs towards the Black Sea.

Three groundwater deposits have been explored within the basin, including two with approved reserves. The aquifer complex is intensively exploited both by group water intakes and individual wells.

A group of GWBs in Paleocene and Eocene sediments (UAM690PG100)

The aquifer of Paleocene and Eocene terrigenous sediments (P1-2) is developed in the Yelanchynska Depression and on the slopes of the Azov massif. It is confined to marine and continental sediments distributed in the Black Sea depression and south-eastern slopes of the Azov crystalline massif. The depth of the aquifer in the river valleys does not exceed 10-20 m, in the watersheds it reaches 150 m, and it is most deeply buried in the Black Sea depression (330-400 m).

The aquifer is a pressure aquifer. Well flow rates vary and range from 2.1 to 16.7 dm^3/s.

The formation of the groundwater chemical clade occurs under diverse and complex conditions. Chloride-sulphate, hydrogen carbonate-sulphate-chloride, sodium-calcium waters with salinity of 0.8-3.0 g/dm3, often 1.2-1.5 g/dm^3, are developed. Water with a salinity of 2.9-3.0 g/dm3 is found only in single wells in areas where there is a flow of mineralised water from the upper horizons. Water with a hardness of 10-15 mg-eq/dm^3 prevails. The groundwater of these deposits is exploited by single water intakes and capture springs.

A group of GWBs in Buchach terrigenous Eocene sediments (UAM690PG200)

It is widespread. Its boundaries generally coincide with those of the Black Sea Basin.

The water-bearing rocks are represented by different-grained, coarse-grained, gravelly sands, which in some areas are interbedded with clays and lignite beds. The depth of the horizon surface increases from north to south from 30 m near Orikhiv to 500 m and more near the Azov Sea coast. The thickness of water-bearing sands averages 20-30 m, decreasing to 10 m in the north and increasing to 50-90 m in the southwestern part of the region.

The horizon is under pressure. The head varies from a few metres to 250 metres, and reaches 590 metres in the south.

The aquifer has a significant water content. Well flow rates range from 20-100 m^3/h at a depth of 6-34 m, with a specific flow rate of 1-7 m^3/h. The coefficients are as follows: water conductivity - 100-220 m^2/d, filtration - 2-13 m/d, piezoconductivity - 1.7×106 m^2/d.

The chemical composition of groundwater in the horizon is of mixed type with predominance of chlorine and sodium ions. Groundwater salinity to the north of Melitopol city, as a rule, does not exceed 1 g/dm3, within Melitopol city it varies from 0.9 to 1.5 g/dm3. To the south and west of Melitopol, there is an increase in mineralisation, which amounts to 3.1 g/dm3 near Novohorodivka village, 7.1 g/dm3 near Chkalove village, 15.2 g/dm3 near Kyrpichne village and 20 g/dm3 in Volodymyrivka village.

Groundwater from the Buchachian deposits is of great importance for water supply to settlements north of the latitude of Melitopol. In the south of the Polohivskyi, Vasylivskyi and Melitopolskyi administrative districts, the waters of this horizon are the main water supply for settlements. Water from this aquifer is used to supply Melitopol, Orikhiv, Vasylivka, Vesele and Mykhailivka. In addition, the water is bottled as mineral drinking water for natural and medical purposes.

The main aquifer recharge area is located in the north-eastern part of the region, at the junction of the Kinsko-Yalynska Depression and the Black Sea Depression, where the Buchach aquifer occurs at depths of 30-150 m, in some areas it outcrops directly under the alluvial sands of the Konka River valley, which creates favourable conditions for infiltration of precipitation. A minor source of feeding and recharge of the Buchach horizon is the inflow of water from the underlying Paleocene and Upper Cretaceous aquifers in the areas of their contact, for example, in the Tokmak area. The main discharge of the horizon is into the Sea of Azov. In addition, a significant part of the underground flow is intercepted by capture structures in the cities of Melitopol, Tokmak, Molochansk, Orikhiv, Vasylivka and other settlements in the region, as well as by drainage systems. The group of GWBs in the Eocene terrigenous sediments is protected from contamination.

Group of GWBs in Upper Cretaceous terrigenous sediments (Molochna River basin) (UAM6900K300)

It is distributed within the Molochansky graben of the Black Sea Basin. Water-bearing rocks are glauconite-quartz medium-grained sands. The thickness of the horizon increases from north to south-west from 2-5 to 30-70 m, the highest being observed in Melitopol at 77 m. The depth of the horizon also gradually increases from north to south-west from 350-380 to 500-530 m.

The horizon is high-pressure. The head gradually increases in the south-western direction from 300 to 500 m.

The water content of the horizon is relatively high, with well flow rates exceeding 20 m^3/h at a 10 m water level drop. The average water permeability coefficient is 258 m2/d, and the piezoelectric conductivity coefficient is 3.2×106 m^2/d.

The horizon waters are of mixed type with predominance of chlorine and sodium ions. The water salinity increases in the south-western direction from 0.7-0.9 g/dm^3 (Novopylipivska 2) to 3.6 g/dm^3 (Melitopol) and more. The total hardness does not change (3-5 mol/m3).

The aquifer regime is disturbed due to water abstraction for water supply in Melitopol and Tokmak and drainage works.

The groundwater in the horizon is the object of centralised water supply to Melitopol (Novopylipivskyi water intake) and Tokmak. The groundwater is also exploited by individual wells in Melitopol and Pologivsky administrative districts. The horizon is protected from external pollution.

In the extreme southeastern part (Azov-Kuban Depression), the aquifer is mostly overlain by a thick layer of Paleogene-Neogene sediments. Apart from chalk, it is composed of sands and sandstones, which are the main reservoirs. The water is pressurised.

The depth of the levels increases to the watersheds from 1-3 m to 44-65 m. Well flow rates vary from 0.4 to 4.4 dm^3/s. The waters have different chemical composition. In the areas where atmospheric recharge conditions are unfavourable due to the presence of a thick layer of Cenozoic sediments in the roof of the Cretaceous rocks, sulphate-chloride, chloride-sulphate sodium-calcium waters with a salinity of 1.0-3.6 g/dm^3 are developed.

To the south and southeast of the conventional line drawn from Matviyivka village to Mala Bilozirka village, the salinity of the groundwater of the complex increases significantly, reaching 72.9 g/dm^3 near Syvash Lake. The GWBs is located within the productive Cretaceous strata in the north-eastern part of the basin. The groundwater is confined to sands occurring in the roof and foot of the marl strata. The thickness of the watered layers varies from 1-2 to 50 m. The depth of the aquifer complex varies from 150 to 320-330 m. The horizon is highly pressurised. The head reaches 170-200 m. Static levels are set at a depth of 50-60 m from the ground surface. The well flow rate varies from several tenths to 4-5.5 dm^3/s at a depth of 10-27.6 m. Filtration rates are 2-10 m/d.

Groundwater salinity in the allocated massif is 0.6-0.9 g/dm^3, total hardness is 0.22-6.3 mmol/dm^3. The water type is sulphate-hydrogen carbonate-chloride magnesium-calcium-sodium, sodium chloride-hydrogen carbonate. In the rest of the area, the water in the Cretaceous deposits is saline and well production rates are low. The aquifer complex is fed outside the allocated GWBs on the territory of the Kinsko-Yalynskyi small artesian basin and the slopes of the Ukrainian Shield adjacent to the area of Cretaceous sediments. It is discharged into the Sea of Azov and artificially through drainage at the Pivdenne Bilozirske iron ore deposit. The complex lies at considerable depths, is covered by water-resistant strata and is protected from surface pollution. It is used by individual wells to supply water to settlements and industrial enterprises.

Group of GWBs in Lower and Upper Cretaceous terrigenous sediments (Krynka River basin) (UAM6900K200)

Within the junction of the Donetsk folded structure with the Ukrainian Shield, the aquifer complex is confined to the sediments of the Oleksandrivska, Prymorska, Berdianska and Henicheska Suites and Upper Cretaceous marls and sandstones, Lunacharska Suite and Lower Cretaceous sands and clays. The water-bearing complex in the Cretaceous sediments is mostly covered by a thick layer of Paleogene-Neogene sediments. Its boundary runs along tectonic faults.

The water-bearing rocks are sands, sandstones, marls, and trepels. The aquifer complex is high-pressure. The static level is set at a depth of 0.5 m from the ground surface to 2.5 m above the ground surface. The water content is up to 88-100 m^2/d. By chemical composition, the groundwater is chloride with a salinity of 19-58 g/dm^3 and is of importance as a medical water. The water has a high content of iodine, bromine and boron.

The lithological composition of the water-bearing rocks varies both vertically and in area. They are mainly represented by marls, sandstones and sands. Marls are characterised by rather low water enrichment with well flow rates of 0.001-0.3 dm^3/s at depths of 40-50 m. The depth of the aquifers increases to the watersheds from 1-3 m to 44-65 m. The flow rates of the wells that tested the sandstones vary from 0.07 to 3.3 dm^3/s at a depth of 6.8-33 m. The aquifer is a pressure type. The head varies from 5-40 m in the north to 400 m on the Azov Sea coast. The piezometric levels are set at depths of 20-30 m in the watersheds and up to +1.0 m above the ground surface on the coast.

The water-bearing rocks in the Elanchynska Depression are marls, chalk, sands, sandstones, and spongolites. The thickness of the complex varies from 5-10 m to 200-220 m. The waters are pressure. Water supply of the complex is uneven over the area. Increased water enrichment is observed in the Elanchynska depression. The well flow rates in the Krynka River valley are 27.3 dm^3/s with a water table of 3.9 m. In the watersheds, well flow rates are tenths or hundredths of dm^3/s at a decline of 20-50 m. It should be noted that the pockmarked rocks in the weathering zone (30-70 m) yielded flow rates of 4.3-5.1 dm^3/s at 2.5-5.7 m down dip. The water has a varied chemical composition, mineralisation and hardness.

In the extreme southeastern part (junction of the Donetsk folded structure with the Ukrainian Shield), the aquifer is mostly overlain by a thick layer of Paleogene-Neogene sediments. Apart from chalk, it is composed of sands and sandstones, which are the main reservoirs. The water is pressure.

The depth of the levels increases to the watersheds from 1-3 m to 44-65 m. Well flow rates vary from 0.4 to 4.4 dm^3/s. The waters have different chemical composition. In the areas where atmospheric recharge conditions are difficult due to the presence of a thick layer of Cenozoic sediments in the Cretaceous rock cover, sulphate-chloride, chloride-sulphate sodium-calcium waters with a salinity of 1.0-3.6 g/dm3 are developed.

The complex receives its main water supply from aquifers of Neogene, Paleogene and Precambrian rocks.

The aquifer complex is suitable for centralised water supply.

The GWBs in the Lower-Upper Cretaceous terrigenous formations is naturally protected, so it is not vulnerable to contamination.

Group of GWBs in Lower Cretaceous terrigenous sediments (Molochna River basin) (UAM6900K100)

The GWBs in terrigenous Lower Cretaceous sediments (code UAM6900K100) is distributed south of Vasylivka and Orikhiv, within the Molochanskyi graben, and to the north of the GWBs. The water-bearing rocks are represented by continental quartz grained sands, with thicknesses ranging from 5 to 45 m, and up to 80 m in the Ulyanivska depression.

The horizon depth gradually increases to the south from 330 to 650 m.

The aquifer complex is highly pressurised. The head increases in the south-western direction. The water content of the complex is relatively high. The specific well flow rate is 2-3 m^3/h. Average coefficients: water conductivity - 204 m^2/d, piezoconductivity - 3.7 * 106 m^2/d.

The chemical composition of the water in the GWBs is calcium-sodium. The anionic composition is mixed (with a predominance of chlorine ions). Mineralisation ranges from 0.7 to 0.9 g/dm^3 (Melitopol deposit), with a total hardness of 2-5 mol/m^3. In the southern direction, in the area of Semenivka and Voznesenka villages of Melitopol district, a sharp increase in water salinity up to 10.2 g/dm^3 (Melitopol city) and more occurs during the dive. The total hardness is 3 - 5 mmol/m^3.

The GWBs in the Lower Cretaceous terrigenous deposits is protected by natural conditions, so it is not vulnerable to contamination.

The groundwater massif regime is disturbed due to water abstraction for water supply in Melitopol and Tokmak - Cretaceous sediment water is used for water supply in these cities. They are also exploited by single wells in Melitopol, Pologivsky and Vasylivsky administrative districts.

Group of GWBs in the terrigenous carbonate layer of coal deposits (UAM6900C200)

It is distributed in the northeastern part of the Azov basin, mainly in the open part of Donbas, where rocks are exposed to the daily or pre-Cenozoic surface.

The water-bearing rocks are limestone and sandstone, alternating with argillites, siltstones and coal. The sandstones are 15-20 m thick, sometimes reaching 70-120 m. Limestone is no more than 2-3 m thick in most cases, but sometimes reaches 10 m. The ratio of lithological types is unstable and varies both in area and in vertical section. There is a percentage increase in sandy rocks from east to west. In the vertical section, sandstones are most abundant in the Upper and Middle Carboniferous sediments.

In the intensive weathering zone with a thickness of 10 to 70 m, and sometimes up to 150 m, sandy and clayey shales are also permeable, which together with sandstones and limestones form a single watered zone with a free surface. Below the weathering zone, the fracturedness and permeability of mudstones and siltstones decreases, the hydraulic connection between individual sandstone and limestone layers deteriorates, and the water in them becomes pressure. The water enrichment of the complex also depends on the degree of tectonic fractures in the rocks. Such tectonic fault zones as faults and discharges are characterised by increased water enrichment. Separate water-bearing layers of sandstones and limestones are distinguished in the sandy-clayey thickness of coal deposits.

The water content of the complex is variable both in strike and depth. The well flow rates vary from hundredths of a dm^3/s to 20.9 dm^3/s at the depths of 28.0-5.8 m. Heads increase with the depth of aquifers up to 500 m.

The chemical composition depends on the conditions of groundwater formation.

In the open part of Donbas, where there are no covering sediments or their thickness is insignificant, sulphate-hydrocarbonate and hydrocarbonate-sulphate waters with a salinity of up to 1 g/dm^3 are formed. These waters are moderately hard (5.8-8.9 mmol/dm3). The depth of occurrence is 30-50 m. They are developed in the Central and Chistyakovo-Snizhnyansky geological and industrial areas.

To the west, north-west and south-west, with the increase of cover sediments, the sulphate content in the water increases, with mineralisation ranging from 2.0-2.15 g/dm^3 to 3.0 g/dm^3 and sometimes even up to 6.3 g/dm^3. With deepening, the mineralisation increases to 26.1-26.0 g/dm^3.

The Carboniferous aquifer complex is fed by infiltration of precipitation at the outcrops to the surface and by overflow from the overlying aquifers.

The groundwater of the fractured weathering zone is promising for drinking purposes. In the Donetsk hydrogeological fold region, the complex is widely used for centralised and individual water supply.

Group of GWBs in the Lower Carboniferous limestone-dolomite sequence (UAM6900C100)

The GWBs in limestone-dolomite deposits of the Carboniferous is widespread within the southern edge of Donbas, in the area of the Donetsk hydrogeological fold region junction with the hydrogeological region of the Ukrainian Shield.

Water-bearing rocks are represented by fractured and karstic limestone and dolomitised limestone, which form a single fractured-karst aquifer. The fractured zone extends to depths of 40-70, sometimes 100 m. It is overlain by Meso-Cenozoic rocks and in river valleys it comes out to the surface. The water level depth varies from 1 to 20 m in the valleys and increases to 70 m in the watersheds. As the water sinks beneath younger sediments, it becomes pressurised. Heads reach up to 174 m.

A characteristic feature is a significant number of tectonic faults that break water-bearing rocks, as well as karstification of water-bearing rocks. The outcrops of the carbonate aquifer to the surface or under the Meso-Cenozoic sediments can be traced in the form of a narrow strip (up to 6-8 km) from northwest to southeast. The thickness of the stratum varies from 0.0 to 650 m, reaching its maximum values in the area of Sukhoi and Mokrai Volnovakha. To the west, the thickness decreases to 100-70 m.

In the weathering zone, the limestone stratum is the only aquifer. As the stratum sinks beneath younger sediments, the water becomes pressurised. Groundwater levels range from 0-20 m in river valleys to 60-70 m in watersheds.

The water content of the limestone formation is extremely uneven. Along with virtually waterless wells (specific flow rate of 0.1 dm^3/s), there are wells with specific flow rates of more than 20 dm3/s. The most water-enriched rocks are those in tectonic fault zones, where the total production of water intakes can reach 2,000 m3/h. River valleys are characterised by increased water enrichment compared to watersheds, with water level fluctuations of 5-6 metres or more.

The water enrichment significantly decreases towards the watersheds, with the maximum water enrichment observed near tectonic faults accompanied by areas of the most karstic rocks. Water intakes are located in the valleys of the Sukha and Mokra Volnovakha rivers: Novo-Troitsky, Kipucha Krynytsia, and Karakubsky. The wells have flow rates of 50-120 dm^3/s. In the eastern part of the aquifer complex, its carbonate-sulfate and sulfate-hydrocarbonate water types are developed with salinity of 0.6-1.9 g/dm^3, with 1.0-1.4 g/dm^3 prevailing.

The western part of the area is characterised by predominantly sulphate waters with a dry residual of 1.7-2.2 g/dm^3 and a total hardness of 8-19 $mg\text{-}eq/dm^3$. In the northern part of the Novotroitske area, throughout the Olenivska and Shevchenkivska areas, sulphate-chloride waters with salinity ranging from 1.3 to 2.6 g/dm^3 prevail, with values of 1.6-2.1 g/dm^3. To the west of the Sukha Volnovakha River basin, the water most often has a salinity of 3.0 g/dm^3 or more. The aquifer is recharged mainly in the areas where it is exposed to the Precainozoic and Pre-Quaternary surface. Although the groundwater in carbonate carbonate deposits is naturally protected from contamination from the surface, it is subject to man-made impacts due to mine drainage in the process of coal mining. The gypsometry of the groundwater mirror is complicated by depression sinkholes from water intakes and quarries. They reach several kilometres in diameter with a water level drop of 35-40 m in the centre. The aquifer is intensively exploited for centralised water supply.

GWB in Devonian sediments (UAM6900D100)

It is distributed over a small area in the south of the Donetsk Trough (Kalmius River basin). The lithological composition of the water-bearing strata is quite diverse. It includes limestones, sandstones, conglomerates, shales, as well as paleobasalts, tuffs and tuff-breccias. The conditions of occurrence and the degree of water permeability of the rocks are heterogeneous both in area and in section, due to the geological and tectonic features of the Devonian sedimentary-effusive strata, weathering and overburdening processes. At the contact with crystalline rocks of the Precambrian, sandstones and conglomerates of the Devonian serve as a groundwater reservoir. In the dip zone, sandstones, conglomerates and limestones are the aquifers, while other rocks are watered only in areas of tectonic faults.

The water-bearing stratum is broken by faults of different orientation, which cause increased fracturing and, consequently, water enrichment of rocks in the fault zones. The waters are pressurised. The head height varies from 40 m in the south near the contact with Precambrian granites to 200 m in the north in the area of Devonian-Carboniferous rocks contact. The thickness of the waterlogged sandstones is 13-55 m, more often 30-35 m. Depth of the waterlogged stratum cover is 18-115 m. Thickness from 2 to 80 m.

Well flow rates vary from tenths to 1.5 dm3/s at water levels of 15-20 m, with well flow rates reaching 7.4 dm3/s only in tectonic fault zones in river valleys and gullies.

The aquifer complex is fed by infiltration of precipitation, groundwater inflow from crystalline Precambrian rocks, and discharge of deep water through tectonic faults widespread in the Devonian sediments.

Sodium sulphate waters with a salinity of 0.8 to 2.7 g/dm3 are formed mainly, while sulphate-chloride waters with a salinity of 5.1-6.0 g/dm3 were observed in wells located in the tectonic fault zone. The levels are set at a depth of 0-30 m. Poor quality of groundwater limits its use for household and drinking purposes.

A group of GWBs in the fracture zone of Archean-Proterozoic crystalline rocks (UAM690AR100)

It is widely distributed within the Azov megablock. It is confined to the upper most weathered and fractured part of Precambrian rocks, represented mainly by granites, migmatites and gneisses. In the river valleys, water-bearing rocks are exposed to the earth's surface or are overlain by a thin layer of Meso-Cenozoic sediments. The depth of the fractured and weathered zone from the surface of Precambrian rocks varies from 2-5 m to 80-90 m and even 110-120 m, most often not exceeding 40-50 m. The weathering crust of crystalline rocks is developed mainly within watersheds, and is absent in river valleys and large gullies. The thickness of the weathering crust varies from 0.1-0.2 to 10-30 m.

Three hydrodynamic zones were identified according to the degree of water enrichment. The first zone coincides with an interval of heavily weathered and often fractured rocks (weathering crust), the second zone is a zone of increased fracturing (fractured zone) and the third zone of fracture attenuation (weakly fractured zone). All of the above zones of the Proterozoic crystalline aquifer are interconnected, although this connection is sometimes complicated.

The aquifer is predominantly pressure, with lower heads in river valleys and springs in some places. Heads range from several tens to several hundred metres. The water table depth varies from 0-5 m in river valleys to 80-90 m in watersheds.

The crystalline rocks are characterised by very uneven water saturation due to their uneven fracturing in area and depth. The most waterlogged zones are confined to the low areas of the modern relief, which coincide with the developed hydrographic network and large gullies.

In crystalline rocks, the most fractured zone is watered, the thickness of which is determined by the depth of the local erosion base (100-150 m). Below that, groundwater in crystalline rocks is associated with fractured zones of tectonic faults.

The well flow rates vary from 0.001 to 5-9.2 dm3/s at depths of 53.0 and 5.6 m, respectively. In general, the well flow rates do not exceed 1.0-1.2 dm3/s at a depth of 15-20 m. The water content of rocks increases sharply in tectonic fault zones, where well flow rates reach 4.5-10 dm3/s at 2.5-15.5 m downhole.

The chemical composition of groundwater is determined by the nutritional conditions. In areas with favourable conditions for precipitation infiltration (in river valleys and gullies), sulphate-hydrocarbonate and hydrocarbonate-sulphate calcium-sodium waters are formed with a mineralisation of 0.3-1.8 g/dm3 and a total hardness of 2.5-14.7 mmol/dm3. As the thickness of the covering deposits increases, the water is enriched with sulphates, its salinity increases to 1.6-3.0 g/dm3 and often reaches 4.6-5.2 g/dm3. The waters are generally slightly alkaline to neutral (pH 7.0-8.2).

The aquifer is fed mainly by atmospheric precipitation.

2 SIGNIFICANT ANTHROPOGENIC IMPACTS ON THE QUANTITATIVE AND QUALITATIVE STATUS OF SURFACE AND GROUNDWATER, INCLUDING POINT AND DIFFUSE SOURCES

2.1. Surface water

The Azov sea river basin is located within 4 oblasts: Kherson, Zaporizhzhia, Donetsk and Luhansk. The socio-economic structure of the basin creates prerequisites for the formation of anthropogenic pressure that affects surface waters. The main factors of anthropogenic pressure include:

- population. There are 1662 settlements in the basin, including the uncontrolled territories, with a population density of about 59 people/km^2 in Zaporizhzhia region, about 155 people/km^2 in Donetsk region, and about 36 people/km^2 in Kherson region.
- enterprises from various sectors of the Ukrainian economy. The main industrial sectors in the basin include mining, metallurgy, food processing, metallurgical production, and mechanical engineering. The share of water abstraction for industrial needs is 82% of the total water abstraction in the basin.

  The main negative impact is associated with wastewater generated by the metallurgical and municipal sectors. The metallurgical industry is one of the largest water consumers, accounting for 99% of total industrial water consumption.
- the municipal sector is also the leading one in terms of water consumption in the basin. The share of water consumption by the municipal sector is 15% of total water withdrawals.
- the main agricultural crops grown in the region include cereals, industrial crops, vegetables and melons, and fodder crops. The share of water consumption by enterprises and organisations related to the agricultural sector is 3% of the total water intake.
- cross structures on small and medium-sized rivers prevent the free passage of water, sediments and migration of aquatic life, and change the transit mode of rivers to an accumulation one.

The characterisation of anthropogenic pressures and its impact was carried out on the basis of chemical, physico-chemical and hydromorphological indicators that reflect the conditions of existence of the biotic component of aquatic ecosystems. Changes in these parameters under conditions of significant anthropogenic pressure may lead to the risk of not achieving the "good" ecological status of the SWBs.

The assessment of the anthropogenic pressures on the SWBs was carried out in accordance with the Methodological Recommendations for the Analysis of the Main Anthropogenic Pressures and Their Impact on the Surface Water Status, which were approved at the meeting of the Scientific and Technical Council of the State Agency of Ukraine for Water Resources on 20 April 2023, Minutes No. 2.

The methodological basis of the assessment was the DPSIR model developed by the European Environment Agency (EEA)[1] and adapted to the conditions of Ukraine. The determination of anthropogenic pressure was based on a sequential analysis of Drivers/Activities → Pressures → State → Impact → Response (Fig. 5).

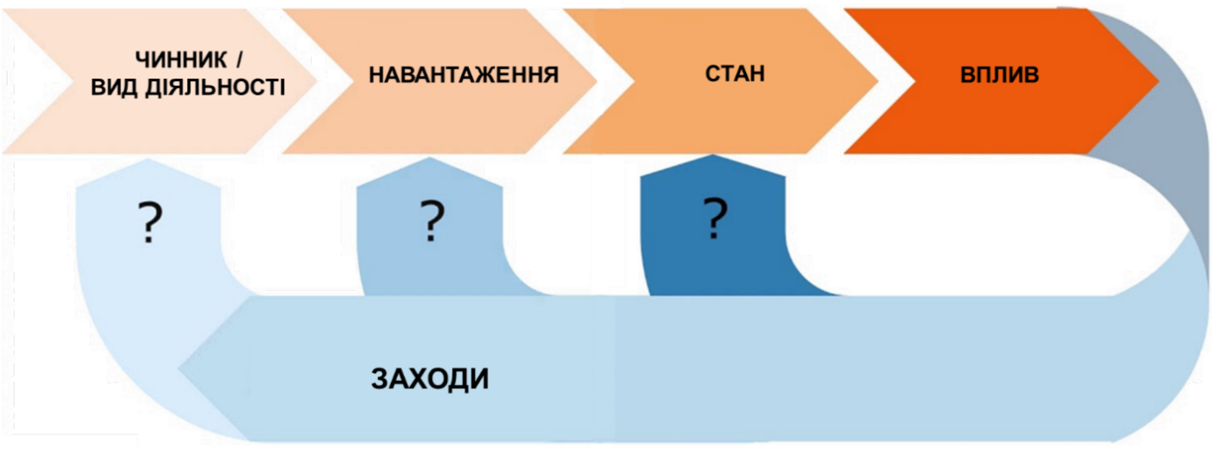


Figure 5 DPSIR conceptual model

The risk of not achieving a "good" ecological status of the SWB is determined on the basis of criteria for chemical,

[1] CIS Guidance #3 Pressure and Impact Analysis, EU, 2003

physico-chemical and hydromorphological indicators.

Criteria for chemical and physicochemical indicators:

- Disposal of untreated wastewater (point sources) - used for organic matter and nutrients;
- Wastewater fraction (point sources) - used for hazardous substances;
- Soil nitrogen balance (diffuse sources) - to determine the impact of crop production;
- Livestock index (diffuse sources) - to determine the impact of livestock.

Criteria for hydromorphological indicators:

- Disruption of the continuity of water flow and environments due to the presence of transverse artificial structures in the riverbed, disruption of the continuity of water flow and sediment movement and migration of fish and other aquatic life;
- Water intake;
- Flow control;
- Fluctuations in water levels downstream artificial structures in the channel;
- Morphological changes that reflect a violation of the natural morphological characteristics of rivers.

By comparing the criteria with the thresholds, 3 risk categories are identified:

1. "not at risk"
2. "possibly at risk"
3. "at risk"

The overall risk assessment for a SWB is determined by the worst value of any one criterion.

Assessing the risk of not achieving "good" ecological status

The risk of not achieving "good" ecological status/potential of an SWB is the risk, for each individual SWB, of not achieving the environmental objectives of the EU WFD by the end of the planning cycle, taking into account the current state of the SWB, the expected changes in the pressures on the SWB and the possible effects of government programmes and projects already implemented.

To assess the risk, an analysis of the anthropogenic pressures within the river basin area is carried out, based on chemical and physico-chemical components and hydromorphological changes.

The risk of failure to achieve environmental objectives is assessed separately from diffuse and point sources of pollution, as well as hydromorphological changes.

Assessment of the risk of failure to achieve environmental objectives from point sources of pollution

Based on the results of the assessment of anthropogenic pressures from point sources of pollution and their impact on the basin's SWBs, the risk of not achieving good ecological status/potential was determined (Fig. 6) for

- 507 SWBs - "no risk"
- 48 SWBs - "at risk".

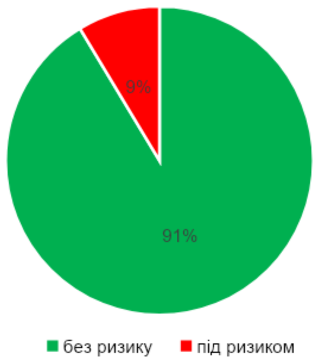


Figure 6 Risk assessment of failure to achieve good ecological status/potential based on the results of the assessment of anthropogenic pressures from point sources

Assessment of the risk of failure to achieve environmental objectives from diffuse sources of pollution

Based on the results of the assessment of anthropogenic pressures from diffuse sources of pollution and their impact on the basin's SWBs, the risk of not achieving good ecological status/potential was determined (Fig. 7) for

- 344 SWBs - "no risk"
- 71 SWBs - "possibly at risk"
- 140 SWBs - "at risk".

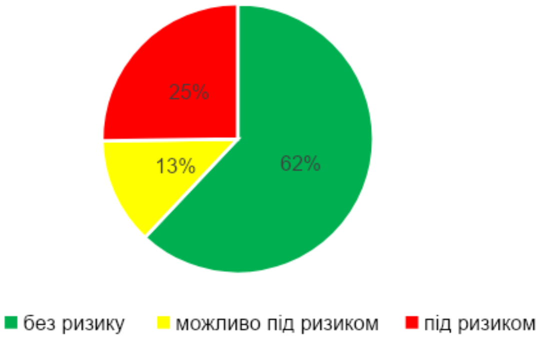


Figure 7 Risk assessment of failure to achieve good ecological status/potential based on the results of the assessment of anthropogenic pressures from diffuse sources

Assessing the risk of not achieving environmental objectives: hydromorphological changes

According to the results of the assessment of hydromorphological changes, it was established (Fig. 8)

- 339 SWBs - "no risk"
- 216 SWBs are "at risk".

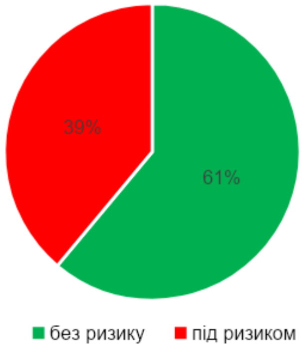


Figure 8 Risk assessment of failure to achieve good ecological status/potential based on anthropogenic pressure assessment: hydromorphological changes

Generalised risk assessment of failure to achieve good ecological status/potential

The risk of not achieving good ecological status/potential has been assessed as follows:

- 166 SWBs - "no risk"
- 43 SWBs - "possibly at risk"
- 346 SWBs are "at risk".

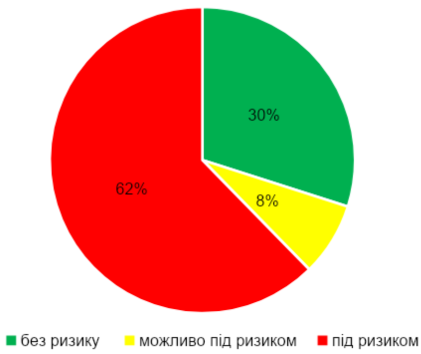


Figure 9 Summary assessment of the risk of not achieving good ecological status / potential of the SWBs

Impact of military operations on the state of surface water bodies

The hostilities have been going on in the Azov Sea region since the 2nd quarter of 2014. Since 24.02.2022, the situation has deteriorated further due to the military aggression of the Russian Federation. The entire basin is located in the temporarily occupied territory, where active hostilities are taking place.

The impact of the armed conflict has primarily disrupted the sustainable and well-established system of water use. Water intake volumes do not take into account the existing water balance, which can lead to significant shifts in the course of various processes, when the ecosystem will not be able to ensure its self-regeneration.

Due to the undermining of the hydraulic engineering structures, water bodies in the basin face water shortages for drinking and other needs.

Another aspect of water use is water disposal, which must be controlled in terms of pollutant intake and compliance with maximum permissible discharges by business entities. During the armed conflict, emergencies have become more frequent, leading to the sudden release of a significant amount of pollutants in the discharge of waste water.

The system of continuous water monitoring has been disrupted, resulting in the interruption of long-term data series on the basis of which measures to improve the condition of the SWBs are being designed, reducing the reliability of the conclusions drawn. Observation posts in the conflict zone are closed.

Pollution (organic, biogenic, hazardous) substances caused by the **pollution:**

- **destruction, shutdown, disruption of the technological process of treatment facilities and increased load on them due to the growing number of internally displaced persons.**

The list of facilities in the Azov Sea River Basin that have suffered damage, suspension or disruption of the WWT process is presented in Table 20.

Table 20. List of objects affected by hostilities[2]

№	Entity	Information on destruction/damage
1	Municipal Enterprise "Miskvodokanal" of Tokmak City Council, Tokmak community	As a result of hostilities, a 55 kW frequency converter was damaged. The degree of damage cannot be determined*.
2	Municipal Enterprise "Berdianskvodokanal" of the Berdiansk City Council, Berdiansk community	No information is available *.
3	Municipal enterprise "Vodokanal" of the Melitopol City Council, Melitopol community	No information is available *.
4	Municipal Enterprise Novy Byt, Novenskaya community	No information is available *.
5	Municipal Enterprise "Clean City Primorsk", Primorsk community	No information is available *.
6	Municipal enterprise Mariupolvodokanal, Mariupol community	No information is available *.
7	Volnovakha water and wastewater treatment plant of the "Water of Donbass" company, Volnovakha community	No information is available *.
8	Volnovakha water and wastewater treatment plant of the "Water of Donbass" company, Olhynia community	No information is available *.
9	Volnovakha water and wastewater treatment plant of the "Water of Donbass" company, Myrnenska community	No information is available *.
10	Mariupol Regional Branch of Municipal Enterprise "Water of Donbass", Mariupol community	No information is available *.
11	Municipal Enterprise Donkomunhosp, Volnovakha community	No information is available *.

Additionally:

1. According to the Polohiv District State Administration, the shelling damaged one 55 kW frequency converter at the Municipal Electricity Supply Station of the Municipal Enterprise "Miskvodokanal".
2. Due to the temporary occupation, the Melitopol and Berdiansk administration reported no information on the destruction/damage of the WWTs in the areas in question.

Information on the cases is presented in Annex 3.1.

[2] Note:* - temporarily uncontrolled *territory*

- **destruction, suspension, or disruption of the technological process of enterprises (including warehouses and oil product depots)**

In the Azov Sea river basin, 68 cases of destruction, suspension or disruption of the technological process of enterprises as a result of hostilities were recorded between March 2022 and May 2024.

The largest number of cases concerned the destruction of infrastructure - 53 cases, disruption of work - 7 cases, power outages - 4 cases, and dismantling - 1 case.

The information was prepared by the Zoy Environmental Network for the OSCE Project Co-ordinator in Ukraine. Detailed information on the cases is presented in Annex 3.

- **direct hits of pollutants from missiles, shells of military equipment, their washing away, seepage in combat zones**

Artillery shells, rockets and other munitions are mainly composed of a metal shell filled with an explosive, propellant and a detonator.

Explosives are classified into primary explosives (mercury, lead azide, TNT) and secondary explosives (THE, hexogen, tetryl, TNT, picric acid, plastid-4, ammonites, dynamites, ammonals).

Metals are associated pollutants. The most common is lead, but also antimony, copper, cadmium, chromium, mercury, arsenic, nickel, bismuth and tungsten. As a rule, metals are concentrated in the sinkhole.

Flares burn at high altitude and disperse metals over large areas. Pyrotechnics can contain barium, antimony, strontium, copper, magnesium, manganese, chromium and lead. Unlike explosives and fuels, metals occur naturally in the environment, so their background concentrations need to be measured.

The detonation of rockets, artillery shells and mines produces a number of chemical compounds, including carbon monoxide and carbon dioxide, water vapour, nitrogen oxide, nitrogen, etc. A number of toxic elements, including sulphur and nitrogen oxide, also evaporate.

Monitoring of surface water in the area of active hostilities and recently liberated territories is not currently carried out for security reasons.

The hydromorphological changes caused:

- **Changes in the hydrological regime due to the destruction or disruption of the operation of hydraulic structures (dams, dikes, locks)**

Hydraulic structures at the Kainkulatskoye reservoir of the Tokmachka River (Molochnaya River).

In May 2023, starting from the city of Tokmak, Russian war criminals blocked the Tokmachka River along all bridges and blew up two dams of the Kayinkulatskoye reservoir. There is no information on the state of the water body - the territory is temporarily occupied.

Crossing the Kalchyk River.

In May 2023, the occupiers blocked the Kalchyk River in Mariupol and turned it into a swamp instead of a river. This made it impossible to replenish the reserve reservoir in the Old Crimea, which is filled by the flow of the Kalchyk River and provides Mariupol with drinking water. Mariupol with drinking water.

- **water intake to eliminate water shortages for drinking and other needs**

Due to the drop in the water level in the Kakhovka reservoir, a large part of the Dnipro, Zaporizhzhia, Mykolaiv and Kherson regions will be left without water supply.

The State Agency for the Restoration and Development of Infrastructure of Ukraine plans to build 3 links of the water pipeline, which will be capable of delivering about 300,000 cubic metres of water per day with the possibility of increasing the volume of water supply. The total length of the new water pipeline will be 87 kilometres. Water will be taken from the Ingulets River. As of September 2023, a part of the water pipeline has already been constructed. The newly constructed infrastructure will provide high-quality drinking water to the residents of Nikopol, Manganets, Kryvyi Rih, Tomakivka, Maryanske and Pokrov.

Water was supplied to Berdiansk from the Kakhovka reservoir by the Operational Water Supply Shop of the Western Group Water Conduit (hereinafter referred to as the WGW Shop) of the Oblavvodokanal (almost 175 km). However, the backup water source is the Berdiansk reservoir, which has almost 10 times the hardness, salinity, and sulphate content of Dnipro water, and artesian wells. After the occupation of the city, the occupiers tried to take over the management of the housing and communal services with rather disastrous results. In May 2022, the Oblvodokanal utility company of the Zaporizhzhia City Council informed the city that the ECW of ZGV was running out of liquid chlorine, and the occupiers were blocking its delivery. Therefore, it was planned to stop water supply, and if the occupiers had resumed it without permission, the water would have been of technical quality. However, the water supply continued for some time. In August 2022, the city was without electricity for 40 hours. There were interruptions in water supply, and after the launch, in water quality. According to one of the Telegram channels, the water utility did not stop supplying water to the population at the same time as the blackout to maintain pressure in the system, but continued to supply water until the tanks were empty, which made it difficult to launch the system after the power was restored.

In October 2022, the Western Group Water Supply System stopped working due to a power outage, and the occupation authorities decided to switch the city to water supplies from the Berdiansk Reservoir, which did not meet minimum quality requirements.

In addition, the Operational Water Supply Shop of the Western Group Water Supply System of the Oblavvodokanal provided drinking water supply services not only to Berdiansk, but also to Prymorsk and 21 villages in Melitopol and Yakymivka districts. Currently, there is no information on the supply of drinking water to these settlements.

At the end of 2022, a power line in Tokmak was damaged by shelling. As of 2 March 2022, the city authorities reported that they were trying to resolve the problems with electricity and water. There was no drinking water supply in the city. The city is supplied with water from 16 artesian wells 180-200 metres deep. After repair work, the water supply was restored, but the community continued to experience problems with electricity and water.

- **Increased fluctuations in water levels below hydroelectric dams during periods of peak load coverage**

There are no hydroelectric power stations in the Azov river basin.

Impossibility of water monitoring or reduction of its programme (spatially and temporally) in the temporarily occupied territories.

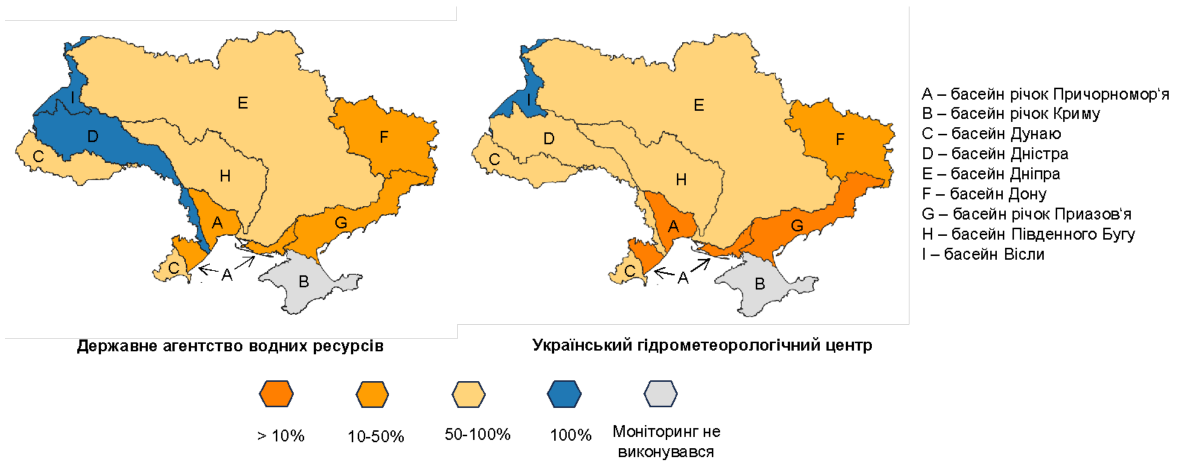


Figure 10 Achievement of surface water monitoring targets by river basins (%), 2022 [3]

Impossibility or restrictions on water management in the temporarily occupied territories.

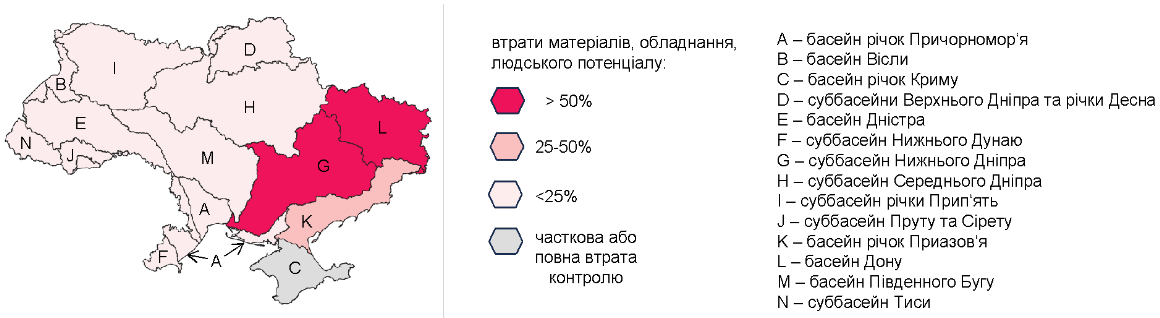


Figure 11 Impact of military operations on the ability to manage water resources[5]

[3] The information was prepared by the Zoy Environmental Network for the OSCE Project Co-ordinator in Ukraine.

2.1.1. Organic pollution

The main cause of organic pollution is insufficient or no wastewater treatment. Organic pollution can lead to significant changes in the oxygen balance of surface waters and, as a result, to changes in the species composition of aquatic life or even their death. The input of organic matter with wastewater is usually assessed by indirect indicators of BOD and COD.

Diffuse sources

Organic pollution from diffuse sources is mainly caused by rural households that are not connected to sewerage networks. Such individual households dispose of wastewater by accumulating it in lagoons, from which it is filtered into the nearest groundwater horizons.

The load from the rural population was assessed using the calculation method. For this purpose, we used the coefficients of organic matter intake due to the vital activity of 1 person. In European countries, the generation of load from the population is calculated according to the following indicators: BOD5 - 60 g/day/person, COD - 110 g/day/person.

The assessment revealed that in just one year, distributed sources in the Azov Sea river basin contribute organic matter: 790 tonnes of BOD5 and 1,343 tonnes of COD, which is significantly higher than the total input from point sources. The reason for this is the low level of population connection to sewage treatment plants. In rural settlements and small towns, wastewater is discharged into lagoons built in the ground, from where pollutants easily enter groundwater and are transported to surface waters.

Point sources

In total, there are 1662 settlements in the Pryazovia RBD, including the uncontrolled territories. Cities with a population of more than 100 thousand people have the greatest impact on the status of the SWBs. There are 5 such cities in the Azov Sea RBD, the largest of which is the city of Mariupol, Donetsk Oblast, with 470 thousand inhabitants.

In 2018, these large cities contributed a total of 283.2 tonnes and 1,648.0 tonnes of organic matter by BOD5 and COD, respectively, to the SWBs of the Azov Sea basin (Table 21).

Table 21. Settlements in the Azov River Basin with an PE>100 thousand people[4]

City	Population	The name of the water body to which the sewage is flowing	Type sewage treatment waters	Total organic matter load, t/year	
				BOD5	COD
Mariupol	470968	Kalmius River, Kalchik River	biological	115,7	1028,6
Makiivka	379884	Gruzka	biological	59,0*	225,0*
Melitopol	152479	Molochna, Tashchenak River,	biological	38,2	192,4
Yenakiyevo	105391	Mius River, Sadky River, Bulavyn River, Olkhovatka River, Hlukha River	biological	46,3*	194,0*
Khartsyzsk	100314	Kolesnikov beam	biological	24,0*	8,0*
TOTAL	**1197564**			**283,2**	**1648,0**

The analysis of urban settlements showed that the Azov Sea RBD under study belongs to areas with a high degree of urbanisation.

In 2018, these large cities supplied a total of 283.2 tonnes and 1648.0 tonnes of organic matter by BOD5 and COD, respectively, to the Azov Sea RBD in 2018.

These data clearly demonstrate the importance of addressing the problem of organic pollution in the basin.

The organic matter emission rates for individual SWB are shown in Table 23. In total, in 2018, 3.7 thousand tonnes of organic matter (COD) were discharged to the Azov Sea RBD as part of wastewater. The total load came from the Molochna, Mius, Kalmius, and Mokryi Elanchyk rivers, with contamination from small rivers whose waters are discharged into larger rivers. For example, the Kalchyk River to the Kalmius River.

[4] Note:* - for the territories not controlled by the Government of Ukraine, data for 2013 are given.

Table 22. Inputs of organic substances to surface waters as part of wastewater from urban agglomerations, 2018[5]

Name of the river	Organic matter, tonnes per year	
	BOD5	COD
Little Utlyuk	1,0	2,3
Dairy	41,2	218,6
Bilmanka	-	0,1
Mius	39,3*	142,0*
Naked	17,3*	43,0*
Headband	0,3*	2,0*
Vyshnevetska	55,0*	97,0*
Yuskin	11,0*	25,0*
Rovenka	80,0*	211,0*
Kripenka	55,3*	144,0*
Crystal	12,0*	56,0*
Miusik	21,0*	107,0*
Khartsyzsk	29,0	94,0
Calculator	78,9	716,2
Kalmius	122,3	1 044,2
Little Kalchik	3,0	12,0
Wet Volnovakha	8,0	33,0
Dry Volnovakha	2,0	14,1
Gruzka	59,0	222,0
Kolesnikova	24,0	8,0
Wet Elanchik	6,0	18,0
Krinka	4,8	17,0

2.1.2. Nutrients pollution

Nutrient inputs to the surface waters of the Azov Sea river basin are the driving force behind eutrophication, which leads to an increase in primary production and accumulation of organic matter. The enrichment of water with nutrients that stimulate the development of autotrophic aquatic organisms, resulting in an undesirable imbalance of organisms in the aquatic environment and a decrease in water quality.

Phosphorus and nitrogen compounds play a dominant role among biogenic substances, with some influence from ferrous, silicon and molybdenum. Of the first two, phosphorus plays a greater role, while nitrogen is much less likely to limit the development of autotrophic organisms, due to the ability of many bacteria and cyanobacteria to fix it.

Nutrients can come from both point and diffuse sources. The main sources are untreated wastewater from municipal and industrial facilities. The widespread use of phosphorus-containing detergents and washing powders with insufficient wastewater treatment increases nutrient pollution. The efficiency of phosphorus removal from wastewater at most wastewater treatment plants in Ukraine does not exceed 20%, but due to outdated equipment, the efficiency of phosphorus removal by treatment plants often does not reach design values.

Diffuse sources

Land cover type is the dominant factor in anthropogenic load from diffuse sources. Disturbance of the soil cover due to ploughing leads to significant nutrient losses due to deflation and water runoff.

The land use indicator, namely the share of agricultural land, is used as one of the indicators to assess the impact of diffuse sources. The total area of agricultural land is more than 70% of the land fund and the threshold value for failure to achieve good ecological status of 30% creates conditions where all MES in the basin are at risk of failing to achieve "good" ecological status from diffuse sources.

The Azov Sea RBD is characterised by an extremely high level of ploughed land, which in Kherson, Zaporizhzhia, Donetsk and Luhansk oblasts reaches 90.3%, 85.1%, 78.9% and 65.3%, respectively. Some land plots are also ploughed up on slopes. For comparison, in the European Union, this figure does not exceed 35%.

Another important indicator of the anthropogenic load from diffuse sources of pollution is the intensity of agriculture, which is expressed primarily in the amount of fertiliser applied. According to the statistical offices of the oblasts within the basin, fertiliser use varied significantly by region and by crop.

[5] Note:* - for the territories not controlled by the Government of Ukraine, data for 2013 are given.

The majority of mineral fertilisers applied to various crops were nitrogen fertilisers. Overall, there is a general downward trend in fertiliser use in Ukraine compared to the 1990s. However, the current use of mineral fertilisers is in line with many Central European countries and averaged 125 kg/ha in 2018.

An important indicator of the influence of agricultural sources is also the share of livestock Itv. In general, the share of livestock is low and ranges from 0 to 0.065. The average value was 0.009 (Figure 12).

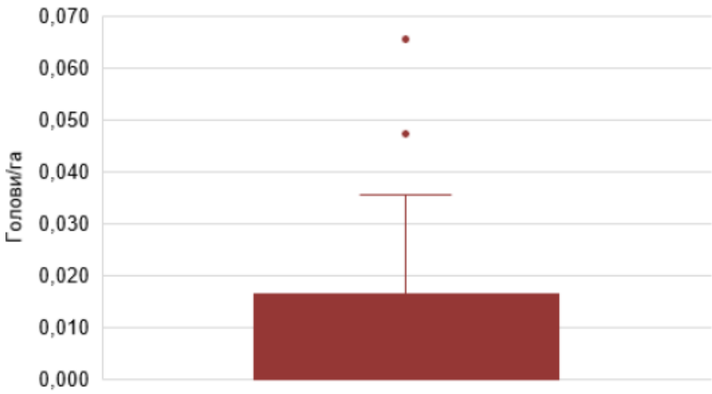


Figure 12 Variability of the criterion "Share of livestock production" in the SWBs of the Azov River Basin

The assessment of the risk of pollution from livestock in the Azov Sea river basin based on the indicator "Share of livestock" shows that there is no risk of water pollution. The value of the criterion "Share of livestock production" in all 445 SWBs does not exceed the threshold level of risk.

In the Azov river basin as a whole, there is a significant anthropogenic load due to diffuse sources of agricultural origin. First of all, its impact is associated with intensive agriculture.

Nitrogen. The emission flow of nitrogen compounds from the basin is 662 tonnes per year. At the same time, the spatial distribution of the nitrogen runoff module is highly heterogeneous. The highest value of 273 t/year is observed in the Molochna River basin, where nitrogen runoff is mostly associated with the municipal sector.

A characteristic feature of the basin is that the dissolved nitrogen is dominated by the nitrate form (96%). This is significantly different from other river basins in Ukraine, where nitrogen in the form of ammonium compounds, the end product of protein mineralisation, predominates in the waters. In other words, if ammonium compounds dominate the nitrogen runoff, it can be concluded that the predominant influence of point sources is prevalent. In the soil cover, the content of ammonium nitrogen compounds is minimal due to their sorption on the surface of clay minerals. Instead, the soil solution is dominated by the nitrate form of nitrogen, which is one of the most soluble and mobile compounds. They do not accumulate in the soil cover, but, on the contrary, are easily washed out during runoff-forming precipitation. The predominance of nitrogen in the nitrate form indicates the influence of diffuse sources of pollution, primarily of agricultural origin.

The degree of influence of anthropogenic factors is strongly related to local environmental conditions. Given the high degree of soil exploitation and fertiliser use, there should be many more areas sensitive to nitrate pollution. However, the basin's soil cover is composed mainly of chernozem soils with a high organic matter content and a heavy particle size distribution. This prevents precipitation from infiltrating to a considerable depth and helps to retain moisture by the soil's colloidal complex.

Climate conditions also play an important role, namely the prevalence of evaporation over precipitation. In the Azov river basin, upward flows of soil moisture are formed, which prevent the occurrence of non-equilibrium processes in the soil-water system and the transition of nitrate compounds into solution. Nitrogen compounds are mainly washed away during the short phase of surface runoff.

In 2018, the concentrations of ammonium nitrogen, nitrates and nitrites in the Azov Sea RBD in the SWB were at the level of 2017 and slightly varied within the annual average. The concentrations of the above substances are shown in Figs. 13 - 15.

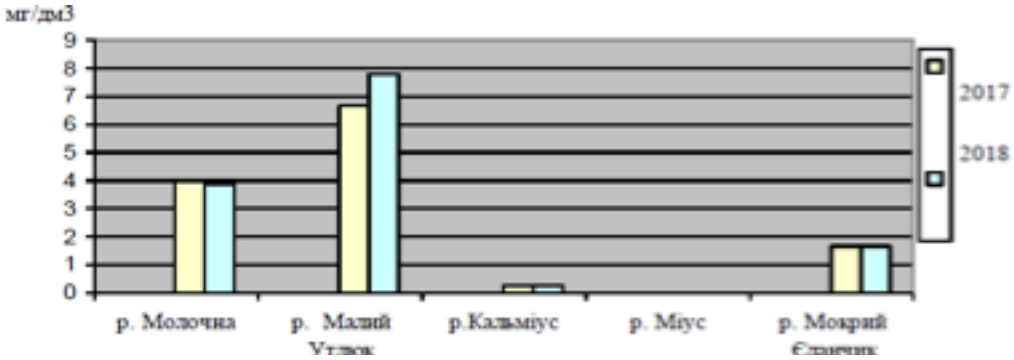


Figure 13 Concentrations of ammonium nitrogen forms

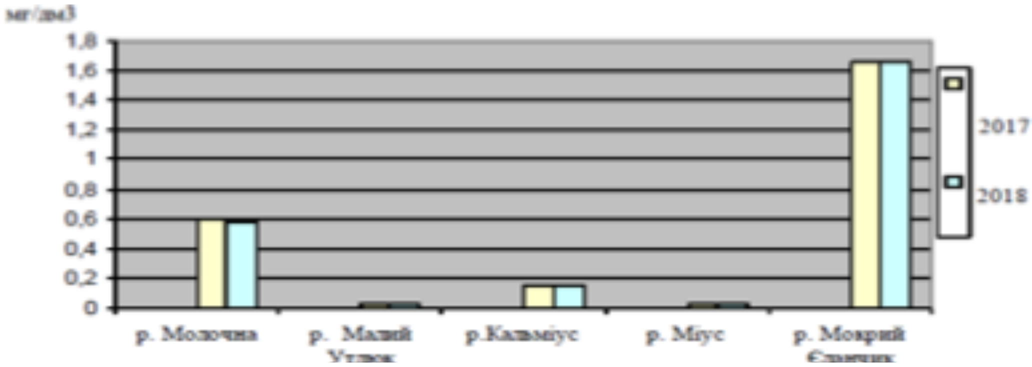


Figure 14 Nitrite concentrations

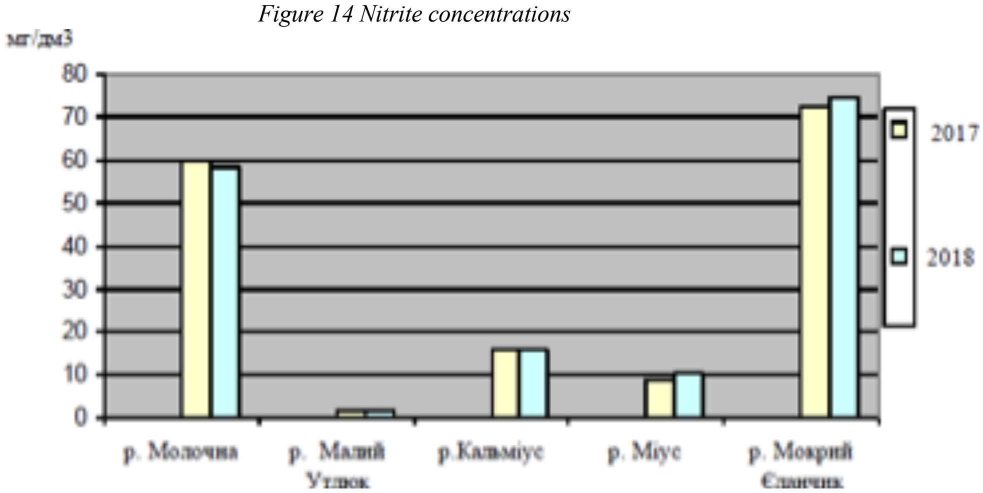


Figure 15 Nitrate concentrations

The water monitoring database of the SAWR and the Hydrometeorological Service for the period 2000-2017 was analysed. Given the instability of nitrogen compounds in water, all its mineral compounds were considered in total (Nmin, mgN/dm^3). In accordance with the requirements of the Nitrate Directive, the 95th percentile of the normalised observation series for nitrogen compounds in water was determined.

The screening of the monitoring data revealed only 2 points where the threshold value of 50 mg/dm^3 was exceeded, which in terms of nitrogen is 11.3 mgN/dm^3. The waters of both sites were under the influence of point sources of pollution.

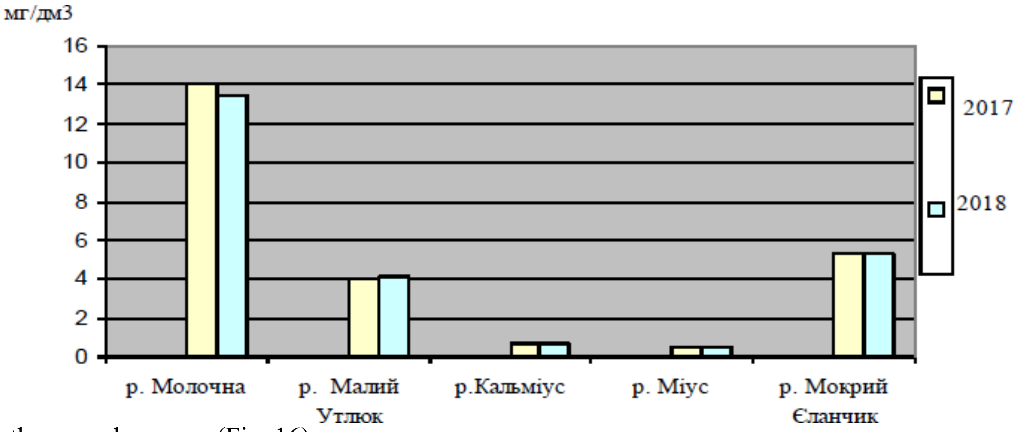
Our results could indicate that there is no diffuse nitrogen pollution of water. After all, following socio-political changes in the early 1990s, agricultural productivity declined significantly and fertiliser application dropped more than 10-fold to 13 kg/ha. After that, a gradual recovery began only in 2000, but the level of 1991, when fertiliser application reached 140 kg/ha, has not yet been reached.

The wastewater treatment plants of urban agglomerations in the Pryazovia RBD are of the biological type, which allows removing no more than 35% of nitrogen compounds. Most of the treatment facilities are morally and physically outdated.

Phosphorus. Phosphorus compounds play a dominant role among nutrients. The erosion component is more important for phosphorus.

The total phosphorus load of the SWBs is 105 tonnes per year. At the same time, the highest values of the phosphorus runoff module are typical for the Molochna River basin and are associated with the impact of municipal services.

In 2018, the concentration of orthophosphate in the SWBs of the Azov sea RBD was at the level of 2017 and varies



slightly within the annual average (Fig. 16).

Figure 16 Concentrations of orthophosphate

The phosphorus balance was in deficit, and therefore phosphorus was not used to determine the anthropogenic impact from diffuse sources in the future.

The high impact of point sources is associated with a significant concentration of population within certain districts. The use of phosphorus-containing detergents for household needs leads to the accumulation of phosphates in wastewater.

Wastewater treatment plants of urban agglomerations in the Pryazovia RBD are of the biological type, which allows removing no more than 20% of phosphorus compounds, the rest being discharged into water bodies. In freshwater, phosphorus is one of the main factors in the development of eutrophication.

Unlike nitrogen, phosphorus from arable land enters the river network in almost equal proportions between dissolved and sorbed forms. The high contribution of erosion processes is determined by the specific behaviour of phosphorus in soils. Once it gets into the soil with mineral fertilisers, it is quickly adsorbed by the minerals of the soil and retained by them for a long time. The high level of land ploughing and the development of erosion processes contribute to the migration of phosphorus compounds as part of suspended particles.

Point sources

Indicators of the main biogenic substances entering the surface waters of the Azov River Basin are shown in Table 23.

Table 23. Inputs of biogenic substances in wastewater to the Azov Sea RBD (2018 data).

Name	Pollutants			
	ammonium nitrogen, tonne	nitrates, tonnes	nitrites, tone	orthophosphates, ton
Molochna	15,3	254,5	2,0	53,474
Little Utlyuk	1,0	0,2	-	0,348
Miusik	3,0	17,6	-	0,445
Mius	6,4	16,5	1,0	3,415
Nagolna	1,5	20,0	0,2	1,493
Nagolchyk	0,1	1,0	-	-
Vyshnevetska	5,4	58,0	1,0	1,821
Yuskina	0,2	2,0	-	0,034
Rovenka	5,4	82,0	3,0	5,556
Kripenka	9,0	75,5	1,8	15,439
Khrustalna (Zholobky)	6,0	35,4	-	0,869
Olkhova	0,3	0,4	-	0,192
Khartsyzsk	13,0	32,0	1,0	8,474
Sadky	4,0	43,0	1,0	5,528
Bulavin	4,0	184,0	2,0	16,103

Name	Pollutants			
	ammonium nitrogen, tonne	nitrates, tonnes	nitrites, tone	orthophosphates, ton
Olkhovatka	0,3	0,3	-	0,149
Hlukha	0,1	1,0	-	0,090
Kalmius	0,8	215,5	2,1	9,625
Kalchyk	30,6	435,5	22,3	8,540
Little Kalchyk	1,0	12,0	1,0	1,467
Mokra Volnovakha	1,0	27,0	1,0	3,349
Sukha Volnovakha	2,1	9,0	1,0	1,332
Gruzka	9,0	629,0	9,0	51,9
Kolesnikova	2,0	194,0	2,0	12,530
Mokryi Elanchik	1,0	23,0	1,0	1,597
Krinka	1,9	9,9	0,3	1,461
Savostianivka	3,0	45,0	1,0	7,078
Orekhova	6,0	15,0	2,0	4,103
Orlovka	3,0	72,0	3,0	4,610
Total	136,4	2510,3	58,7	221,022

According to the state accounting of water use in the form No. 2TP-vodkhoz (annual), the largest amount of nutrients was discharged to the Molochna River by the Municipal Enterprise "Vodokanal" of the Melitopol City Council, to the Malyi Utliuk River by "Akimzhilservis" LLC of Yakymivka, to the Kalmius River by PJSC "Mariupol Ilyich Iron and Steel Works" of Mariupol Mariupol, to the Mius River - Krasnolutsk Department of Luhanskvoda, to the Malyi Elanchyk River - Kompaniya Voda Donbasa of the Municipal Water Supply Company of Ambroievo.

The influence of nutrients on the state of the SWBs can be reflected in the values of phytoplankton, phytobenthos and macroliths and described through the eutrophication process. The eutrophication assessment is based on two separate modules:

A. biological indicators that reflect eutrophication,

B. nutrients that express the main cause of eutrophication.

To assess the degree of eutrophication, the results of biological studies are required:

- Phytoplankton (microscopic plant organisms living in water, cyanobacteria and algae).
- Phytobenthos - bottom diatoms (microscopic and macroscopic diatoms).
- Macrophytes (aquatic vascular plants, mosses, macrophytes).

Since these parameters were not determined in the SWBs of the Azov Sea RBD, the assessment of eutrophication was considered as a probability based on nutrient inputs. Since nutrients are the causes of eutrophication, nitrogen forms (NH4, NO2, NO3) and phosphorus forms (PO4 orthophosphates) were taken into account. The worst of the assessment results were taken into account in the final assessment.

2.1.3. Pollution by hazardous substances

Hazardous substances are represented by priority pollutants. They are subject to control in accordance with the Order of the Ministry of Ecology and Natural Resources No. 45 and the draft Order of the Ministry of Ecology and Natural Resources on Approval of the Methodology for Assigning a Surface Water Body to a Class of Ecological and Chemical Status of a Surface Water Body, as well as Assigning an Artificial or Significantly Modified Surface Water Body to a Class of Ecological Potential of an Artificial or Significantly Modified Surface Water Body.

However, the available information on the discharge of priority pollutants is currently quite limited.

Pollution with hazardous substances such as pesticides, oil products, surfactants, heavy metals has an extremely detrimental effect on the state of the river, its flora and fauna, and its waters become unsuitable for any consumption (drinking, domestic, agricultural and even recreational), as they become toxic and poisonous to all living things.

The sources of such pollution are any wastewater. For example, boiler house wastewater contains softeners and erosion products. The presence of oil and grease on the water surface worsens metabolic processes, reduces the oxygen content in the water, which leads to fish kills. One litre of oil products contaminates up to 12 m^2 of the water surface of a reservoir. If the content of oil products is more than 200 mg/m^3 , the zoological balance of water bodies is disrupted. Synthetic surfactants have a detrimental effect on the development of phytoplankton. Lead, mercury, cadmium, nickel, zinc, and manganese make water toxic when they get into it.

In 2019, river pollution within Zaporizhzhia Oblast was not tested for hazardous substances, with the exception of synthetically produced surfactants.

Table 24. List of specific substances characteristic of the Azov Sea River Basin according to Form 2TP-Vodkhoz (annual), 2018

Name of specific substances	
Aluminium	Copper
Zinc	Sodium
Nickel	SPAR
Vanadium	Phenol
Calcium	Hexavalent chromium
Magnesium	Manganese

The list of priority pollutants and other basin-specific substances discharged with wastewater to the SWBs according to the 2018 Report No. 2TP-Vodkhoz (annual) is presented in Table 25.

Table 25. Pollutant discharges into surface waters (2018 data)

Name	Indicators										
	Aluminium, kg	Vanadium, kg	Copper, kg	Manganese, kg	Nickel, kg	Sodium, kg	Lead, kg	Steam, kg	Chromium 6+, kg	Chrome total, kg	Zinc, kg
Berda	-	-	-	-	-	-	-	0,2	-	-	-
Little Utlyuk	-	-	-	-	-	-	-	3	-	-	-
Molochna	-	-	-	-	-	-	-	806	5	0,2	-
Kalmius	1 063	-	291	1 373	207	-	-	2 688	20	173	1 183
Kalchyk	677	-	139	1 028	129	-	-	107	-	122	747
Little Kalchik	-	-	-	-	-	-	-	106	-	-	-
Wet Volnovakha	67	-	-	-	-	-	-	319	-	-	-
Dry Volnovakha	67	-	-	-	-	-	-	90	-	-	-
Gruzka	-	-	78	-	-	-	-	2 262	20	-	80
Wet Elanchik	-	-	-	-	-	-	-	84	-	-	-
Mius	293	-	-	-	-	-	-	2 944	-	-	-
Krinka	282	-	-	-	-	-	-	2 937	-	-	-
Sevastianivka	-	-	-	-	-	-	-	915	-	-	-
Olkhovka	-	-	-	-	-	-	-	615	-	-	-
Olkhovatka	-	-	-	-	-	-	-	8	-	-	-
Total	**2 449**	**-**	**508**	**2 401**	**336**	**-**	**-**	**13 884,2**	**45**	**295**	**2 010**

It should be noted that the available data on anthropogenic impacts are analysed here only in terms of the whole basin or its tributaries, and not in terms of a single identified SWBs, which is the main "management unit" of the RBMP.

Therefore, each SWB should be assessed and, depending on the assessment, measures should be applied to preserve, maintain or restore it. These measures should be implemented on a site-specific basis, not for the basin or river as a whole.

The discharges of non-synthetic pollutants defined by the Order of the Ministry of Ecology and Natural Resources No. 45 to the Azov sea River Basin SWBs by individual SWBs and enterprises that discharge them are presented in Table 26.

Table 26. Discharges of non-synthetic pollutants to the SWBs

№	Name	SWB code	Ni, kg	Name of the company
1	Kalmius	UA M6.9_0213	207	PJSC "Ilyich Iron and Steel Works of Mariupol"

2.1.4. Accidental pollution and impact of contaminated areas (landfills, sites, zones, etc.)

The Azov sea river basin has a fairly developed industrial activity, including mining (coal), metallurgy, machine building, livestock farming and the food industry - dairies, breweries, etc. - which are potential sources of accidental pollution both through wastewater discharges and through washouts from sites where production waste is stored.

The mechanism for preventing and minimising the risk of accidental pollution is established in the EU member states through the implementation of the Seveso-III Directive (Directive 2012/18/EU), the Industrial Waste from Mining Directive (2006/21/EC)10 and the Industrial Emissions Directive-IED (2010/75/EU)11 and for non-EU countries through the implementation of the recommendations of the UNECE Convention on the Transboundary Effects of Industrial Accidents.

The main provisions of the Seveso III Directive (Directive 2012/18/EU) were transposed into Ukrainian legislation in 2021 by amending the Civil Protection Code of Ukraine, the Law of Ukraine "On High Risk Facilities" (the Law) and a number of other laws.

Thus, in accordance with Article 9 of the Law, a business entity identifies high-risk facilities in accordance with the number of threshold masses of hazardous substances. Based on the results of the identification of a high-risk facility, it is assigned a class 1, 2 or 3.

Article 9-1 of the Law provides for the definition and approval of an accident prevention policy for a Class 1 or 2 hazardous facility. According to Article 10 of the Law, for a Class 1 or Class 2 hazardous facility, the operator shall develop and, in cases specified by the Law, review a report on safety measures at the hazardous facility.

Pursuant to Article 11 of the Law, in order to organise the response to accidents at high-risk facilities, operators develop and approve plans for localisation and elimination of accidents and their consequences for each high-risk facility they operate. The plan for localisation and elimination of accidents and their consequences shall be reviewed at least every three years. The procedure for action in the event of an accident at a high-risk facility is set out in Article 14 of the Law. Pursuant to this article, the Cabinet of Ministers of Ukraine approved the Procedure for Investigation of Accidents at High Risk Facilities by Resolution No. 965 dated 8 September 2023.

Article 15 of the Law stipulates that the operator shall annually submit to the competent authority, local executive authorities, and local self-government bodies information on high-risk facilities owned or operated by the operator by 30 December. At the request of a legal entity or individual or their representatives to obtain information about a hazard that has arisen at high-risk facilities and poses a threat to people and the environment, the operator must submit such information within 48 hours of receiving the request.

Pursuant to Article 16 of the Law, damage caused to individuals or legal entities as a result of an accident at a high-risk facility shall be compensated by the operator who owns the high-risk facility on the relevant legal basis, unless he or she proves that the damage was caused by force majeure or intent of the victim.

At the level of the Azov Sea River Basin, a list of potential accident risk sites should be developed, including operating industrial facilities with a high risk of accidental pollution due to the nature of chemicals stored or used at industrial facilities, contaminated sites, including landfills and dumps located in flood zones. Such a register should first include facilities in the Azov River basin that pose a risk of accidental pollution, primarily sludge ponds and tailings ponds, municipal wastewater treatment facilities, and sites where industrial waste is stored.

As a rule, accidental discharges of pollutants are recorded very rarely on the rivers of the Azov basin, and due to the lack of a comprehensive monitoring system, they remain unexplored. The actual presence of such pollution is assumed, but it is impossible to systematise it.

Due to the unregulated farming system, there is no actual control over the use of pesticides and mineral fertilisers, and the failure to enforce the use of coastal protection strips and water protection zones leads to their destruction. Pollutants easily enter the river through surface runoff.

Most accidental pollution occurs from point sources.

Titan's operations, which are located in the temporarily occupied territory of the Autonomous Republic of Crimea, generate waste (phosphogypsum, pyrite pellets, hydrolytic acid, washing acid, etc.) that is stored in a phosphogypsum storage facility and an acid storage facility and, in the process of accumulation, produces other hazardous compounds. Titan's process water reservoir is partially located on the territory of the Preobrazhenske village council in the Kalanchak district of Kherson region, and the acid storage facility itself is partially located within the Chaplynsk district of Kherson region. The evaporation and release of harmful compounds into the air poses a threat of contamination of surface and groundwater.

The greatest radioactive hazard in the Azov river basin is posed by mines and ore processing enterprises, which produce solid residues containing radioactive elements with half-lives ranging from 1600 to 80 thousand years.

The largest amount of waste in the Azov Sea river basin is generated by the mining, metallurgical, machine-building, coal, chemical and energy industries.

The Ministry of Environmental Protection and Natural Resources of Ukraine has launched an electronic service that also contains the Register of Waste Disposal Sites and the List of Facilities that are the largest polluters of the environment in terms of discharging pollutants into water bodies.

The register of facilities in the Azov Sea river basin that are at risk of accidental pollution is presented in Table 27.

Table 27. Register of facilities in the Azov Sea River Basin that are at risk of accidental pollution

№	Object name
1	ME "Berdianskvodokanal" of the Berdiansk City Council, Berdiansk
2	Municipal enterprise "Vodokanal" of the Melitopol City Council of Zaporizhzhia region
3	Donetsk Regional Production Department of the Utility Company "Voda Donbassa"
4	Mariupol Regional Production Department of the Municipal Enterprise "Water of Donbass"
5	ME "Company "VODA DONBAS" Yenakiyevo water and wastewater treatment plant
6	Khartsyzsk water and wastewater treatment plant of the "Voda Donbassa" company
7	ME "Company "VODA DONBAS" Torez water and wastewater treatment plant
8	Makiivka water and wastewater treatment plant of the company "Voda Donbassa"
9	ME "Company "VODA DONBAS" Snizhne water and wastewater treatment plant, Snizhne. Snizhne
10	Volnovakha water and wastewater treatment plant of the "Voda Donbassa" company Volnovakha

The register of facilities in the Pryazovia RBD that pose risks of accidental pollution needs to be updated annually.

2.1.5 Hydromorphological changes

Hydromorphological changes are one of the significant water management issue (SWMI) that impede the achievement of the environmental objectives set out in the RBMP. Hydromorphological changes resulting from economic activity affect the conditions of aquatic communities, which can lead to a deterioration in the ecological status of the SWB.

Hydromorphological changes are divided into types:

- disruption of the continuity of water and habitats,
- changes in the hydrological regime,
- morphological changes.

Dams and other artificial cross structures located in the riverbeds were built primarily for water accumulation, with subsequent use for irrigation, water supply for the population and industry. In the Pryazovia river basin, 163 SWBs have been identified where there is a disruption of the continuity of water flow and environment (overregulation).

Hydromorphological changes, namely, changes or disturbances in the anthropogenic morphology of riverbeds, banks, and floodplains, are one of the main water and environmental problems in the Azov sea River Basin.

Disruption of the free flow of rivers. Dams, weirs and other structures that cross the riverbed from one bank to the other disrupt the free flow of the river and restrict the migration of fish and other living organisms. The criterion for classifying a structure as one that disrupts flow and migration is a structure height of more than 0.3 m for rivers dominated by carp fish and 0.8 m for rivers dominated by salmonid species.

In the Azov river basin, artificial reservoirs (reservoirs and ponds) are channelised.

The free flow of rivers within the Azov sea river basin is disrupted by the construction of hydraulic structures that stop or slow the flow (dams, culverts, etc.). Within the basin, 90 reservoirs and 1,317 ponds for various purposes have been built.

The accumulation of water in ponds and reservoirs upstream of dams also provides flood protection for areas downstream of dams. According to the SAWR, a significant number of ponds are in poor technical condition. Most of them were built in 1960-1980 according to simplified design documentation. The dams are earthen, with loose slopes, and many of them are eroded. Spillway structures usually do not meet modern requirements in terms of their technical condition.

The presence of dams and other structures across the river channel disrupts the continuity of water flow and sediment movement, as well as the migration of fish and other aquatic life.

Disruption of the hydraulic connection between river channels and their floodplains. The hydraulic connection between the riverbed and the floodplain plays an important role in the functioning of aquatic ecosystems, providing water for important habitats for fish and aquatic life, and has a positive impact on the condition of surface and groundwater.

The assessment of this type of hydromorphological changes is included in the hydromorphological protocol for assessing the SWB used by the SES in the course of state monitoring of surface waters (indicators No. 10: "Interaction between the channel and the floodplain: 10a - Possibility of floodplain inundation, 10b - Limiting factor for the development of horizontal deformations of the channel").

Hydrological changes. Hydrological changes affect water bodies through water withdrawals and fluctuations in water levels below dams, and as a result, lead to changes in the regime and distribution of river flows. Discharges, water withdrawals and artificial periodic fluctuations in water levels (hydroelectricity) are key pressures that require compensatory measures to be implemented on a river basin-wide scale.

There are no SWBs with hydrological changes in the Azov sea River Basin.

Decreased natural flows in the context of global warming and natural water shortages, reduced flow velocities and the formation of stagnant zones contribute to eutrophication processes, and, as a result, lead to a deterioration in biodiversity and degradation of aquatic ecosystems.

Morphological changes. The main factors that negatively affect the natural morphology of river channels, banks, and floodplains in the Azov sea River Basin are urbanisation, flood protection, and agriculture. As a result of these activities, rivers in certain areas are straightened, dredged, and banked, floodplains are ploughed up almost to the channel, and their natural vegetation is changed.

Within the Azov sea river basin, the river channelisation occurs at 5 SWBs.

Reduced variability in channel depth and width, disruption of the natural balance of erosion and accumulation, narrowing of the inter-dam space and restriction of free river meandering lead to an impoverishment of the composition and reduction in the number of biological indicators, such as fish, benthic invertebrates, higher aquatic vegetation, and phytoplankton.

The criteria for classifying SWBs as "HMWB" due to hydromorphological changes are:

- disruption of the continuity of water flow and environments (transverse artificial structures in the riverbed, disruption of the continuity of water flow and sediment movement and migration of fish and other aquatic life);
- water withdrawals (small and medium-sized rivers - water withdrawals exceeding 75% of the supply; large and very large rivers - water withdrawals exceeding 90% of the supply);
- water accumulation (ponds with a ponding area of more than 1 km or several ponds with a ponding area of less than 1 km, but their total length is more than 30% of the length of the SWB, as well as reservoirs with a volume of more than 1 million m^3);
- fluctuations in water levels below the dam (water level fluctuations exceeding 0.5 m per day for most of the year);
- disturbance of natural morphological characteristics of rivers (hydromorphological class below the third according to the monitoring results, or straightening of more than 70% of the length of the main river channel in the absence of monitoring data).

Most cases of hydromorphological changes occur on small rivers in the basin. Small rivers, according to the classification of rivers by basin area used to determine the SWBs, are rivers with a basin area of up to 100 km^2 .

2.2. Groundwater

2.2.1. Pollution

In the Azov sea River Basin, non-pressure GWBs (UAM6900Q100- UAM6900Q400) in river valleys, where they are the first to be located from the surface, and in some places, pressure GWBs (UAM6900N200- UAM690AR100), which are covered from the surface by a thin layer of Quaternary sediments, have low protection against pollution.

The main causes of groundwater pollution are intensive use of groundwater for water supply and irrigation on agricultural land, the use of fertilisers and pesticides, discharges of contaminated wastewater into surface water bodies and filtration fields by industrial and agricultural facilities in the area of aquifer recharge, and the lack of sewerage systems in rural areas. Aquifers first to the surface are the most heavily polluted, as they are poorly protected or not protected at all from vertical migration of pollutants. The main pollutants within the basin are nitrates, oil products, ammonium nitrogen, heavy metals and iron.

One of the most powerful factors of anthropogenic pressure on the GWBs is point sources of pollution. Point source pollution occurs in small areas, but it is usually long-term and concentrated, so pollutants can affect the GWBs in the long term.

The basin's territory is characterised by a concentration of large volumes of fuel and energy and mineral resources, which has contributed to the development of heavy industry. Mining, metallurgy, metalworking and coke-chemical industries are concentrated here. Some of the most critical infrastructure facilities in terms of environmental safety are located within the Azov river basin, including PJSC "Ilyich Iron and Steel Works of Mariupol", PJSC "AZOVMASH", PJSC "AZOVSTAL IRON & STEEL WORKS", PJSC "Dokuchaevsky FDK", PJSC "Novotroitskoye RU", and LLC "Mospinskoye Coal Processing Enterprise". Accordingly, there is a large number of sludge and tailing ponds, industrial waste ponds, ash dumps, municipal waste landfills and rock dumps. Virtually all of the settling ponds are inadequate in terms of technical condition and are overloaded. Filtration from sedimentation ponds contaminates both non-pressure and pressure GWBs, and pollutants spread downstream, forming man-made pollution halos.

According to preliminary estimates, contaminated wastewater from the coal, chemical and petrochemical industries, ferrous metallurgy, and housing and communal services is the main source of surface water pollution, not only of surface water but also of groundwater. In addition, the quality of groundwater in non-pressure GWBs is significantly affected by mine drainage water. Mine water usually contains a large amount of metals, sulphates, oil products, phenols, cyanides, etc. and is characterised by high salinity (up to 20 g/dm^3).

Areas of dispersed anthropogenic impact (diffuse sources of pollution) that may affect the chemical state of non-pressure and pressure groundwater include urbanised areas, industrial zones and agricultural land. It should be emphasised that pollution from diffuse sources mainly accumulates in the upper part of the soil cover, which is why it affects the first non-pressure groups of GWBs from the surface. For the same reason, the impact on pressure GWBs and groups of GWBs protected from surface pollution is practically not recorded.

Agriculture has a significant impact on the non-pressure groups of GWBs (UAM6900Q100- UAM6900Q400) throughout the basin. Here, pesticides and fertilisers are the main factor affecting the quality of non-pressure GWBs. The basin is heavily loaded with diffuse sources of pollution. Here, from 0.98 to 1.56 kg/ha of pesticides and 82-106 kg/ha of mineral fertilisers are applied to agricultural land per 1 ha of sown area.

The maximum amount of agricultural chemicals is used on the territory of the Azov sea River Basin within the Azov Sea coast (Kherson Oblast). The application of pesticides, herbicides and mineral fertilisers causes the accumulation of nitrogen in the soil, as well as the most toxic and persistent organometallic compounds of mercury, arsenic, tin, copper and lead. The use of mineral fertilisers increases the content of phosphorus and alkali metals, primarily lithium, in soils. There are warehouses of pesticides, mineral fertilisers, fuels and lubricants in the Azov River basin, and their storage is not always carried out properly, which can lead to pollution around such facilities.

As a result of anthropogenic impact, the main reason for the deterioration of the quality of the non-pressure group of GWBs from diffuse sources is their contamination with nitrogen compounds - NO3 and NH4. Almost all non-pressure GWBs (UAM6900Q100- UAM6900Q400) in rural areas have organic contamination characterised by high nitrate and ammonium content and oxidation. Nitrate contamination is also typical within some rural settlements and for unprotected pressure GWBs (UAM6900C200, UAM690AR100).

In the Kherson region, according to the Kherson Regional Laboratory Centre of the Ministry of Health of Ukraine, 30% of drinking water sources have water that does not meet the requirements of sanitary rules and regulations in terms of total hardness, sulphates, and chlorides. The greatest deviation from the norms was observed in Henichesk, Beryslav, Kherson and Kakhovka districts. Over the past 10-20 years, the quality composition of water at most water intakes in Kherson Oblast has remained unchanged. Some sections of the Kherson field continue to operate in difficult operating conditions.

The main source of heavy metal pollution of all parts of the ecosystem is air emissions (emissions from industrial enterprises, vehicle exhaust emissions). Areas of soil contamination with heavy metals, in turn, can be a source of heavy metal inputs to groundwater. Pollutants in non-pressure GWBs of territorial and industrial complexes of urban areas are represented by dozens of chemical elements and compounds. Among the heavy metals that create halos with an increased content of heavy metals in non-pressure GWBs, surface waters and bottom sediments are the following: mercury, lead, barium, tin, zinc, chromium, copper.

The halo of barium dispersion in groundwater with concentrations significantly exceeding the GWBs is also associated with the industrial area (Donetsk -1.3 mg/dm^3). The halos with increased lead content (0.04-0.05 mg/dm3) in non-pressure GWBs (UAM6900Q400) are observed in the watershed areas (Donetsk, Makiivka, Yenakiyevo and the adjacent territory), formed due to precipitation and mineral fertilisers. These halos are not stable in time, as the content of contaminants depends on the intensity of application and the time of year when conditions for their accumulation appear. In addition, on the territory of mm. Donetsk, Makiivka, and Yenakiyevo, several lithium dispersion halos in non-pressure GWBs (0.03-0.17 mg/dm^3) were observed, which are confined to areas of lowered relief and industrial wastewater collectors.

Such critical infrastructure facilities as Vodokanal of Berdiansk City Council, Vodokanal of Melitopol City Council, divisions of Voda Donbassa, Tokmak Forging and Stamping Plant LLC have been transferred to the temporarily uncontrolled territory or are located on the contact line, Khiminvest LLC, PJSC Melitopol Compressor, ECV Zakhidno-Gruppy Vodogon of KP Oblavodokanal, SE Mariupol Sea Port, LLC UkrRosKaolin, Branch of SE NIOCHEM of KhMZ and other numerous enterprises of the chemical, metallurgical, mining industries, operating and closed mines, including those that have been suspended.including those where mine water drainage has been stopped.

With the massive closure of mines and a regional increase in groundwater salinity in Donetsk Oblast, there is a risk of increased salinity at water intakes located in river valleys.

In the upper reaches of the Krynka, Kalmius and Mius rivers. Krynka, Kalmius and Mius rivers, the water quality of the group of non-pressure GWBs (UAM6900Q100) has decreased, with salinity almost doubling to 0.6-1.4 g/dm^3, sulphate content exceeding the GWBs and ranging from 112-570 mg/dm^3, chloride within 28-85 mg/dm^3, hard water closer to normal hardness, with an excessive nitrate content of 17-68 mg/dm^3. They are mostly non-aggressive towards metals. The chemical composition of the water is calcium-sodium bicarbonate-sulfate.

In the upper reaches of the Krynky and Mius rivers, mine waters from operating and closed coal mines in dry conservation mode are characterised by a salinity of 1.2-2.0 g/dm3, with a chemical composition of bicarbonate-sulfate, hard. Coal mines in the "wet preservation" mode are at risk of spontaneous outflow of iron-rich mine water with high mineralisation from flooded mine workings, especially in low-lying parts of the relief (into the hydrographic network).

In the Krynky River basin (southern outskirts of Torez), there is a site of contamination of the GWBs (UAM6900Q100) with iron (up to 7.7 MPC), manganese (12 MPC), lead (5.3 MPC), cadmium (9.0 MPC), and oil products (3.3 MPC). The Amvrosiivskyi water intake has been operating on the basis of explored production reserves since 1960. The intensive exploitation of the aquifer in the Upper Cretaceous sediments has led to a decrease in levels in many wells below the design values and to a deterioration in groundwater quality. Mineralisation has increased from 1200-1700 to 1600-2800 mg/dm^3 over the years of observation.

In the mine waters in the same area, there is an increased concentration of lead (1.3 MPC), cadmium (3.0 MPC), and oil products (2.7 MPC). Within the Torez-Snizhnyansky industrial complex, cadmium is almost universally exceeded in mine waters by 1.5 to 10 MPC.

Mines that are flooded usually have a mineralisation 2-3 times higher than that at the time of operation. For example, at the closed mines in the Central District, the mineralisation of mine water has increased several times. Most mine waters are of the sulphate, sulphate-chloride type. Sodium sulphate water is very hard and moderately aggressive to concrete and metal structures. The content of chlorides and sulphates in mine water significantly exceeds the maximum permissible concentrations.

In addition to the increased content of sulphates and chlorides, the water of the Pervomaisk group of mines will also contain other hazardous chemical components, such as metals, phenols and methane.

Within the Starobeshevo industrial complex, groundwater pollution is most intense in the vicinity of wastewater storage and discharge facilities, first entering surface water and then penetrating the Lower Carboniferous carbonate aquifer of the GWBs (UAM6900C100), causing changes in the chemical composition of groundwater. Infiltration flows of contaminated water spread from top to bottom. The Shevchenkivskyi, Kipucha Krynytsia, Maika, Tsentralnyi, Stylskyi, and Komsomolskyi water intakes are located here. Here, in some samples, a slight exceedance of the MPC was detected: manganese, cadmium, and oil products. In addition, hydrochemical anomalies of mercury, arsenic and iron are observed at some water points.

Mariupol's industrial hub has a strong metallurgical industry, and the machine building and construction industries are also well developed. The largest enterprises are Azovstal and Ilyich Iron and Steel Works and Azovmash.

The area of class I-III (manganese, iron, mercury) contamination of the Neogene aquifer is located in the south of the Mariupol industrial complex. The contaminated area is about 88 km2. The maximum value of manganese was determined during testing of well No. 286-gd, drilled for water supply, and reaches 30 MPC. Contamination with other elements is more localised, for example, elevated levels of cobalt and cadmium were detected only near the source of pollution (sludge pond).

The qualitative state of the basin's groundwater is directly related to the quantitative state. For example, intensive exploitation of the Amvrosiivka water intake (since 1960) of the aquifer in the Upper Cretaceous sediments has led to a decrease in levels in many wells below the calculated values and to a deterioration in groundwater quality.

Mineralisation has increased from 1200-1700 to 1600-2800 mg/dm3 over the years of observation.

In the south of Donetsk Oblast (Azov Sea coast), due to saline water recharge, groundwater from Neogene deposits at Petrivskyi, Pershotravnevyi-2 and Prymorskyi-1 water intakes had a salinity of 3200-3700 mg/dm^3 in 2019.

2.2.2. Volumes / reserves

The hydrogeological conditions in the region are complex due to the diversity and inconsistency of aquifers and poorly permeable rocks, facies variability in the lithological composition of water-bearing sediments, and the varied quality of groundwater. Climatic conditions are also not favourable for groundwater accumulation, as the region is located in a zone of insufficient moisture, and therefore insufficient groundwater recharge. The deterioration of the hydrogeological situation in the basin was caused by the constant increase in water consumption for the needs of the economy. In general, the Black Sea artesian basin, within which the Azov sea RDB is located, is characterised by diverse groundwater resource conditions, which generally deteriorate from north to south. The zone of active water exchange increases from north to south from 50 to 250 m. The groundwater resources of the basin are formed mainly from natural reserves and, to a lesser extent, from natural and extracted resources. The main aquifers covered by the regional assessment are those in the Quaternary, Neogene, Paleogene and Cretaceous sediments, with the widespread, powerful aquifer complex in the Neogene sediments being the main and, for the most part, the only source of water supply. Sarmatian, Meotian and Pontic sediments are the most water-saturated, and their groundwater is used almost everywhere.

According to rough estimates, the forecasting groundwater resources (FGR) of the Azov Sea river basin are about 382.4 thousand m3/d, which is 0.6% of the total for Ukraine. This is an important strategic resource of clean, pollution-free drinking water.

No assessment of groundwater resources in non-pressure aquifers has been carried out in Ukraine. As for the pressurised aquifers with drinking water, their assessment was carried out within administrative regions. Information on the forecasted resources, exploitable reserves and extraction of groundwater is presented in Table 28.

Table 28. Projected resources, exploitable reserves and groundwater production (data for 2020).

Oblast	FGR, ths. m^3/day	FGR on 1 person, m^3/day	OGR (A+B+C), thousand m^3/day	Explo-ration, %	Extraction from FGR, thousand m^3/day	Extraction from OGR, thousand m^3/day	Develo p-ment of the OGR, %	Develo p-ment of the FGR, %
Donetsk	2464,0	0,60	1084,2	44,0	257,428	69,81	6	10
Kherson	4970,8	4,89	930,5	18,7	121,043	88,1	9	2
Zaporizhzhya	1550,7	0,93	316,3	20,4	76,044	46,0	15	5

The availability of FGR per capita is the lowest in Donetsk Oblast and the highest in Kherson Oblast. The exploration of FGR (ratio of OGR to FGR, %) in Donetsk, Kherson and Zaporizhzhia regions is 44.0%, 18.7% and 20.4%, respectively. The indicators of the development of the FGR and OGR in these regions indicate the possibility of increasing groundwater production.

Water intakes in Kherson region, which exploit groundwater with explored reserves, operated in a stable hydrodynamic regime. A regional increase in water levels in the coastal zones of the Azov and Black Seas was observed. The reason for this is a decrease in groundwater extraction along the entire transit route. Reducing the operational load on aquifers helps to restore operational groundwater reserves.

In Zaporizhzhia Oblast, a deep depression sink with an area of 10,000 m^2 and a level drop of up to 130 m in the centre was formed in the Buchach aquifer of Paleogene sediments under the influence of mine drainage at the Pivdenne Bilozirske iron ore deposit, which merged with depression sinks at the Melitopol and Tokmak water intakes. As a result of intensive exploitation of the aquifer in the Buchach sediments, in the period from 1965 to 1995, the area of distribution of groundwater with a salinity of more than 1500 mg/dm^3 in the direction of Melitopol increased and amounted to 2.5-3.0 km. A depression sinkhole with a radius of 2.5 km and a 100-110 m water level drop in the centre was formed in the area of Melitopol water intake. The reduction of groundwater extraction from the aquifer in the Buchach sediments in the 1990s at the Melitopol water intake led to a decrease in the amplitude of the groundwater level decline in the Buchach sediments from 1-2 m to 0.5 m, with temporary stabilisation and a slight increase in some areas.

The impact of military operations on the status of GWBs

A significant negative factor of anthropogenic impact on the environment is Russian aggression. Currently, most of the basin's territory is occupied.

Non-pressure GWBs. The quality of non-pressure GWBs may be affected by the ingress of pollutants (heavy metals, fuels and lubricants, organic pollution, etc.) from the surface in areas of intense shelling. The destruction of industrial facilities can lead to the ingress of various pollutants into the soil and rocks of the aeration zone, and in the long term, negatively affect the quality of groundwater.

Changes in the quantitative state of non-pressure GWBs in most of the basin's territory are not expected due to military operations.

Pressure GWBs. A characteristic feature of Ukraine's recent civilisational development due to the war with Russia is large demographic losses: increased mortality, decreased birth rate, migration, which is also typical for the territory of the study basin. Accordingly, in the coming years, industrial production is likely to decline, so, obviously, centralised consumption of groundwater for domestic use will decrease, and groundwater levels in the pressure groundwater supply systems will gradually recover. Therefore, the quantitative indicators will not undergo negative changes.

The chemical composition of the pressure GWBs will remain stable.

Assessment of the risk of not achieving good status

Risk assessment of failure to achieve good quality (chemical) status

As for non-pressure GWBs, their quality status within settlements is most likely poor (nitrate pollution). There is no data on the chemical composition of non-pressure GWBs outside settlements, but a significant anthropogenic pressure from diffuse sources of pollution within agricultural landscapes and their natural vulnerability allows us to conclude that they are at risk of not achieving good quality (chemical) status. Within agro-landscapes, this risk is caused by the possibility of nitrates and pesticides entering the water. An additional negative impact is caused by substances that have been or may be released into the environment as a result of military operations, such as heavy metals, nitrates, oil products, as well as elements and compounds released into the environment as a result of the destruction of industrial facilities.

Protected from contamination, the pressure GWBs is not at risk of failing to achieve good quality (chemical) status.

Figure 17. Assessment of the risk of not achieving good chemical status of the GWBs

Assessing the risk of not achieving good quantitative status

There is no negative impact from anthropogenic groundwater abstraction for the pressure and non-pressure GWBs identified in the Azov Sea RBD. Taking into account the reduction of groundwater extraction, there is no risk of failure to achieve good quantitative status for both pressurised and non-pressurised GWBs, according to available data.

Table 29. Risk assessment of failure to achieve good qualitative (chemical) and quantitative status

GWBs code	GWBs and GWBs groups	Quality risk		Quantitative risk	
		without risk/ at risk	at risk: the reason	without risk/ at risk	at risk: the reason
Non-pressure GWBs					
UAM6.900Q100	Group of GWBs in alluvial quaternary sediments	at risk	Nitrate pollution, Insecurity against	No risk	
UAM6.900Q200	Group of GWBs in marine and estuarine sediments	at risk		No risk	
UAM6.900Q300	GWBs in aeolian-deluvial and	at risk		No risk	

GWBs code	GWBs and GWBs groups	Quality risk		Quantitative risk	
		without risk/ at risk	at risk: the reason	without risk/ at risk	at risk: the reason
	lake sediments		contamination from the surface		
UAM6.900Q400	A group of GWBs in aeolian-deluvial Quaternary sediments	at risk		No risk	
Pressure GWBs for the pressure GWBs					
UAM6.900N200	Group of GWBs in Pliocene terrigenous sediments	No risk		No risk	
UAM6.900N100	A group of GWBs in Upper Miocene terrigenous carbonate sediments	No risk		No risk	
UAM6.90PG100	Group of GWBs in Paleocene and Eocene sediments	No risk		No risk	
UAM6.90PG200	A group of GWBs in Buchach terrigenous sediments of the Eocene	No risk		No risk	
UAM6.900K300	Group of GWBs in terrigenous deposits of the Upper Cretaceous (Molochna River basin)	No risk		No risk	
UAM6.900K200	Group of GWBs in terrigenous sediments of the Lower and Upper Cretaceous (Krynka River basin)	No risk		No risk	
UAM6.900K100	Group of GWBs in Lower Cretaceous terrigenous sediments	No risk		No risk	
UAM6.900C200	Group of GWBs in the terrigenous carbonate layer of coal deposits	No risk		No risk	
UAM6.900C100	Group of GWBs in the Lower Carboniferous limestone-dolomite formation	No risk		No risk	
UAM6.900D100	GWBs in Devonian sediments	No risk		No risk	
UAM6.90AR100	Group of GWBs in the fracture zone of crystalline rocks of the Archean-Proterozoic	No risk		No risk	

2.2.3. Other significant anthropogenic impacts

Climate change

One of the main manifestations of regional climate change against the backdrop of global warming is a significant increase in air temperature, changes in the thermal regime and precipitation patterns, an increase in the number of dangerous meteorological phenomena and extreme weather conditions, and the damage they cause to various sectors of the economy and the population. These trends are typical for Ukraine as a whole and for the Azov River Basin in particular. The greatest changes have been observed over the past thirty years, which have been the warmest for the period of instrumental weather observations.

The rise in air temperature is observed not only near the Earth's surface but also in the lower troposphere, accompanied by an increase in tropospheric moisture content, and causes an increase in atmospheric instability and convection intensity. These changes have led to an increase in the frequency and intensity of convective weather phenomena: thunderstorms, showers, hail, squalls, and an increase in the maximum intensity of precipitation and its storm component.

A characteristic feature of the changing moisture regime in Ukraine is a change in the structure of precipitation. In the warm period, this is manifested in an increase in the intensity of precipitation and an increase in its storm component. The increase in precipitation intensity has led to an increase in daily precipitation, although the number of rainy days has decreased and the maximum duration of the rain-free period has increased. These trends are also typical for the Azov Sea river basin.

The rise in air temperature and uneven distribution of precipitation, which is localised and heavy in the warm season and does not ensure effective soil moisture accumulation, has led to an increase in the number and intensity of drought events.

During the cold season, a significant increase in air temperature led to a change in the precipitation pattern due to an increase in the frequency of rain and a decrease in the frequency of snowfall, resulting in an increase in the incidence of sleet, sleet and ice.

During 1991-2020, the average annual air temperature in the Azov Sea basin increased significantly, at a rate of 0.56 °C/10 years. These changes were three times higher than the rate of change in global temperature over this period. As a result, the average annual air temperature increased by 0.8 °C compared to its long-term average in 1961-1990. Winter became warmer by 1.4 °C, summer by 1.0 °C, spring by 0.7 °C, and autumn by 0.5 °C.

The annual amount of precipitation has not changed significantly over the past 30 years compared to the climatic norm of 1961-1990, but there has been a redistribution of precipitation between seasons, with a decrease in summer (-6%) and winter (-10%) and an increase in autumn (3%).

Such climate change has already been reflected in a decrease in the volume of water flow in rivers and their intra-annual distribution. Spring flooding, which was typical for the rivers of the Azov basin, has significantly decreased, which in turn has led to a deterioration in channel flushing, and water rarely reaches the floodplain in spring and does not feed floodplain reservoirs. Negative manifestations of the change in the hydrological regime of rivers include: siltation of riverbeds, overgrowth of riverbeds (which, in particular, leads to their narrowing), intensification of erosion of the riverbed and banks, loss of hydraulic diversity, disappearance of hydromorphological forms (rifts, pools, rapids, etc.), change in the natural vegetation of the floodplain adjacent to the riverbed, and overgrowth of shrubs and trees.

The water and heat balance of the river basin is highly sensitive to climate change. Rising air temperatures and changing precipitation patterns affect not only the hydrological regime of rivers, but also the overall water resources. Climate change is increasing the frequency of floods and droughts, which makes agriculture, energy, transport and the social sector vulnerable, as they depend on water resources.

Pollution of water bodies with solid household waste, including plastic

The pollution of water bodies by solid waste, primarily plastic, is one of the pressures that leads to the deterioration of the ecological and chemical state of surface waters. This problem is not specific to the Pryazovia river basin, but to the whole country and reflects the problem of waste management at both national and local levels.

Gaps in national legislation, an inefficient system of waste collection, transport and disposal, and a low culture of waste management are manifested in a large number of unauthorised and spontaneous landfills, including on river banks. Some of the waste ends up directly in rivers and water bodies, which is not only an aesthetic problem, but also leads to chemical pollution of water, poisoning of living organisms and deterioration of their living conditions.

Over time, plastic breaks down and turns into microplastics, which get into living aquatic organisms, contributing to the accumulation of toxins.

Microplastics are less than 5 mm in size and fall into two groups: primary and secondary. Primary microplastics are part of cosmetics (toothpastes, scrubs, shower gels, etc.), industrial cleaning products, and are also formed as a result of wear and tear on car tyres and when washing synthetic products.

Recycled plastic is produced by shredding large plastic waste such as bottles, disposable tableware, packaging, etc.

No special studies have been carried out on the amount of waste on the banks and directly in rivers and water bodies in the Azov river basin, nor on its direct impact on the ecological and chemical state of water bodies.

Invasive species

Invasions of alien species outside their "native" habitats are global in nature. The naturalisation and further spread of invaders can cause irreversible environmental damage and undesirable economic and social consequences.

Currently, biological invasions are considered to be biological pollution, but unlike most pollutants that can decompose in natural ecosystems through self-purification processes and whose content is controlled by humans, alien organisms that have successfully invaded begin to multiply uncontrollably and spread rapidly in the environment. This phenomenon can have unpredictable and irreversible consequences.

In addition, the introduction of alien species leads to irreparable losses of biodiversity, both through direct destruction of native species by predators, food and spatial competition, and as a result of displacement of native species, changes in their habitats and hybridisation. The emergence of any alien species is an indicator and, at the same time, a cause of the deterioration of the ecological state of a water body. All this causes a special danger of invasions and determines the specifics of control measures in terms of the risks of not achieving a "good" ecological status of MPAs where the process of invasion of adventive species is carried out.

The issue of invasion of alien species is legally reflected in the Law of Ukraine "On the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period up to 2030", the Decree of the President of Ukraine of 17 December 2021 No. 668, which put into effect the decision of the National Security and Defence Council of

Ukraine of 15 October 2021 "On the Strategy of Biosafety and Biological Protection", the Action Plan for the Implementation of the Strategy of Biosafety and Biological Protection for 2022-2025, approved by the Cabinet of Ministers of Ukraine on 07 July 2022 No. 57Z, and the Convention on Biological Diversity.

In accordance with paragraph 5 of the Action Plan for the Implementation of the Strategy for Biosafety and Biological Protection for 2022-2025, approved by the CMU Resolution No. 573 of 07.07.2022, the Ministry of Ecology approved the "Methodological Recommendations for Assessing the Existing and Potential Impact (Risks) of Invasive Alien Species" by Order No. 290 of 15.03.2024 (https://mepr.gov.ua/nakaz-mindovkillya-290-vid-15-03-2024/).

The Guidelines have been developed with due regard to the Regulation (EU) No 1143/2014 of the European Parliament and of the Council (22 October 2014) on the prevention and management of the introduction and spread of invasive alien species, and Delegated Regulation (EU) 2018/968 of the European Commission of 30 April 2018, supplementing Regulation (EU) No 1143/2014 of the European Parliament and of the Council on the risk assessment of invasive alien species, in order to harmonise approaches to impact (risk) assessment when preparing proposals for the inclusion of alien species in the List of Invasive Alien Species of Flora and Fauna of Ukraine.

Studies of alien aquatic species in the basin are not conducted systematically and are sporadic.

The reasons for the appearance of alien species are related to direct anthropogenic impact. Almost half of the identified alien species appeared in the fish fauna as a result of human fishing activities.

The main ways of spreading invasive species are:

- aquaculture or fish farming of commercially valuable fish species;
- Accidental or unintentional introduction of commercial species along with stocking;
- aquarists, which contributed to the spread of species as a result of their deliberate release into natural reservoirs or accidental entry into the latter (sunfish, rotan, silver crucian carp);
- Expansion of the natural ranges of Ponto-Caspian species as a result of hydroelectric construction and global warming (round goby, sand goby, goby, goby, western goby, blunt-nosed goby);
- unauthorised stocking of rivers with alien species without scientific justification and expertise and relevant permits (Danube salmon).

According to the Convention on Biological Diversity (The Hague, 2002), measures aimed at mitigating the effects of invasions by alien species should be mainly preventive, but it is usually not possible to effectively control the process of invasions, primarily due to the lack of a biodiversity monitoring system.

After conducting special studies of alien aquatic species and determining the list of species in the area of their occurrence, the first and most important step is to establish a basin-wide monitoring system for invasions. Monitoring should be focused on:

- identification and analysis of the species composition of alien species, invasive corridors, geography and dynamics of invasions;
- population dynamics of the most significant invasions from emergence to naturalisation, as well as of invasive species that have already been naturalised, and the consequences of their impact on habitats, native species, communities and ecosystems;
- Inventory of possible intrusion sites and their survey (e.g., municipal wastewater leaks from large cities with a developed aquarium services market, discharges of heated water from thermal power plants and large industrial enterprises).

Provision must also be made at the basin level:

- development of regional/basin cadastral lists of alien, threatened (dangerous) species of flora and fauna of Ukraine;
- predicting the emergence of new invasive species that are potentially dangerous for human economic activity or established hydroecosystems;
- development of methods to curb the spread of alien species (e.g. physical removal, weakening the development of species using phytophagous animals, use of herbicides). An example is the programme for monitoring, localising and controlling the number of alien (invasive) plant species in the territory of the territorial community of Stryi City Council for the period 2021-2025;
- making management decisions on the protection and rational use of aquatic bioresources (including introduced ones), including regional lists of invasive species approved by local governments. For example, in 2017 the Zakarpattia Regional Council approved the first official regional list of invasive plant species in Ukraine.

3. ZONES (TERRITORIES) TO BE PROTECTED AND THEIR MAPPING

3.1. Emerald Network sites

The Emerald Network is an ecological network consisting of special areas for the conservation of biological diversity created (designated) in accordance with the Convention on the Conservation of Wild Flora and Fauna and Natural Habitats in Europe (Bern Convention). Its goal is to ensure the long-term survival of species and habitats listed in the Bern Convention that require special protection.

On 30 November 2018, six countries - the Republic of Belarus, Georgia, the Republic of Moldova, Norway, Switzerland and Ukraine - officially approved the lists of Emerald Network sites on their territories. The updated list of Emerald Network sites was approved on 2 December 2022. The Emerald Network of Ukraine includes 377 territories[6] , and covers about 8% of Ukraine's territory.

There are 21 sites of the Emerald Network within the Azov sea River Basin.

By category (Fig. 18), the sites are divided into:

- Emerald Network territory - 7
- nature reserve - 6
- national natural park - 3
- nature reserve - 2
- regional landscape park - 1
- natural monument of local importance - 1
- without environmental protection status - 1

Figure 18 Breakdown of Emerald Network sites by category (%)

None of the sites has a management and development plan in place. A list of Emerald Network sites within the Azov Sea basin is provided in Annex 4.

Impact of military operations

The Emerald Network sites located in Donetsk, Luhansk, Zaporizhzhia and Kherson regions have been under occupation since February 2022.

Due to the constant shelling of the border areas, access to the nature reserve fund is prohibited. There is no information on the environmental situation in Donetsk, Luhansk, Zaporizhzhia and Kherson regions.

According to the Kherson administration, within the Azov Sea basin of the Kherson region, the Askania Nova Biosphere Reserve and the Azov-Sivash National Nature Park are in the zone of humanitarian crisis and are deprived of the opportunity to receive funding. The situation is further complicated by the fact that the demining of nature reserves results in craters from explosions, which significantly damages or destroys natural areas and all living things on them. Detonations, shelling, and mining of nature reserve areas lead to the destruction of various species of birds and animals and their habitats.

After the de-occupation, the territory where the Emerald Network facilities are located needs to be inspected.

3.2. Sanitary protection zones

[6] UPDATED LIST OF OFFICIALLY ADOPTED EMERALD SITES (NOVEMBER 2018) Document prepared by the Directorate of Democratic Participation and Marc Roekaerts (EUREKO) https://rm.coe.int/updated-list-of-officially-adopted-emerald-sites-november-2018-/16808f184d

Sanitary protection zones include areas where water intakes for drinking water supply are located. According to the Resolution of the CMU "On the Legal Regime of Sanitary Protection Zones of Water Bodies" of 18 December 1998 No. 2024, these zones are classified as the so-called first zone (strict regime) of compliance with the use regime. The Resolution provides for a number of permitted and prohibited activities within drinking water intakes.

According to the EU WFD (Article 7), "Member States shall identify in each river basin:

- All surface/groundwater bodies used for abstraction of water intended for human consumption, providing on average more than 10 m³ of water per day or providing water consumption for more than 50 people and
- Those water bodies that are intended for future use for the same purpose."

There are 108 water intakes within the Azov sea river basin (2021 data), which withdraw more than 10 m^3 per day.

Of these, 104 are groundwater intakes and 4 are surface water intakes (Fig. 19).

Figure 19 Distribution of drinking water intakes by type (%)

The SAWR is responsible for maintaining state water accounting.

3.3. Protection zones for valuable aquatic bioresources

Areas designated for the protection of economically important aquatic species or areas for the protection of valuable aquatic bioresources include those areas where such aquatic resources of significant economic value are found or cultivated.

Depending on the specifics of the protection zone for valuable aquatic bioresources, the monitoring programme may include additional indicators or sampling frequency.

According to the Resolution of the CMU No. 1209 "On Approval of Tariffs for Calculating the Amount of Compensation for Damage Caused by Illegal Harvesting (Collection) or Destruction of Valuable Aquatic Bioresources" dated 21 November 2011 (as amended by the Resolution of the CMU No. 1039 dated 6 October 2021), the list of valuable bioresources includes both rare and common fish species throughout Ukraine.

At the same time, according to Article 1 of the Law of Ukraine "On Fisheries, Commercial Fishing and Protection of Aquatic Bioresources", a fishery water body (part thereof) is a water body (part thereof) that is used or may be used for fisheries purposes.

3.4. SWBs / GWBs used for recreational, medical, resort and health purposes, as well as water intended for bathing

Recreation areas of water bodies are land plots with adjacent water space intended for organised recreation of the population on the coastal protective strips of water bodies. Places of mass recreation are determined by local governments in accordance with the powers vested in them every year before the start of the summer swimming season. Water protection zones are established along rivers, around lakes, reservoirs and other water bodies, within which land plots are allocated for coastal protection strips.

It is prohibited in water protection zones and coastal protection zones:

- storage and use of pesticides and fertilisers;
- construction of cemeteries, summer camps for livestock, manure storage facilities, cattle cemeteries, waste dumps, filtration fields, liquid and solid waste storage facilities, etc;
- discharge of untreated wastewater;
- construction of any structures (except for hydrotechnical, hydrometric and linear structures), including recreation centres, summer cottages, garages and car parks;
- Washing and maintenance of vehicles and equipment.

Requirements for the location and organisation of water body recreation areas:

- To organise recreational areas on water bodies, their owners or lessees are required to agree the operation of the beach with the State Service of Ukraine for Food Safety and Consumer Protection before the start of each swimming season.
- the recreation area should be located outside the sanitary protection zones of industrial enterprises. The recreation area should be located at the maximum possible distance (at least 500 m) from sluices, hydroelectric power plants, wastewater discharge sites, stables, livestock watering places and other sources of pollution.
- beaches should not be located within the first zone of the sanitary protection belt of drinking water sources.

Environmental goals for recreational areas:

- The water quality of reservoirs and rivers used in recreational areas must meet the requirements of sanitary legislation.
- the composition and properties of water in the area of recreational water use must meet the requirements for physical, chemical and sanitary-microbiological indicators.

Requirements for water monitoring in recreational areas:

- water sampling for departmental control in water bodies should be carried out annually by local authorities at least 2 times before the start of the bathing season (at a distance of 1 km upstream of the bathing area on watercourses and at a distance of 0.1-1.0 km in both directions from it on water bodies, as well as within the bathing area).
- during the swimming season, such water sampling shall be carried out at least twice a month at at least two points selected in accordance with the nature, length and intensity of use of swimming areas.

Pursuant to CMU Resolution No. 264 of 06.03.2002 "On Approval of the Procedure for Registration of Places of Mass Recreation on Water Bodies", local executive authorities and territorial fishery protection authorities are required to identify on maps and schemes land plots and water areas suitable for the organisation of beaches, boat rental facilities, water attractions, as well as places for water sports and places for amateur and sport fishing in winter.

Approved copies of the maps are submitted to the emergency rescue services that serve water bodies in their area of responsibility and to the regional coordination emergency rescue centres of the State Specialised Emergency Rescue Service on Water Bodies of the Ministry of Emergencies (currently the State Emergency Service).

Information on places of mass recreation is submitted annually by 1 April by local governments, and information on places of recreational and sport fishing is submitted on 10 February and 30 October by territorial fish protection authorities to regional coordination emergency and rescue centres of the SES.

As of November 2023, no recreational sites have been identified in the Azov sea River Basin due to the occupation of the basin.

3.5. Areas vulnerable to (accumulation of) nitrate

Ukraine has approved a methodology for determining nitrate vulnerability zones (Order of the Ministry of Ecology of Ukraine No. 244 dated 15.04.2021), as required by the EU Nitrate Directive. The methodological approach is to use a large amount of high-resolution spatial and temporal data, mainly surface and groundwater monitoring data, but the definition of these zones should also use statistical data such as the number of livestock, fertiliser application and surplus calculations for nitrogen. All this information of high quality and sufficient reliability is necessary to identify nitrate vulnerable areas where mandatory measures to reduce nitrate pollution should be taken. At present, the existing surface water monitoring network is insufficient in terms of its integrity and spatial coverage to apply the developed method, and groundwater monitoring is not carried out at all.

Therefore, given that in Ukraine:

- the highest percentage of arable land in the world (53.9%, 2021 data), while the ploughed-out agricultural land rate is 78.2%;
- lack of representative and reliable information on the content of nutrients in surface and groundwater;
- Eutrophication of water bodies is a widespread phenomenon;

In the short term, it is proposed to designate the entire territory of Ukraine as a nitrate vulnerable area. This approach is in line with the EU WFD, reflects the current very limited availability of the necessary information to identify nitrate vulnerable areas, is used in many EU countries (e.g. Germany, Austria, Lithuania and Romania), is easier to assess, and allows for refinement or identification of nitrate vulnerable areas in subsequent reporting periods based on improved, more reliable information.

This approach avoids competition among farmers in the short term and allows all farmers to be financially supported through future rural development programmes without the need to differentiate between different regions. It also allows for the general measures of the action programme to be applied to the entire territory, but for more stringent action programme measures to be applied only to regions where (based on available data) clear agricultural stress can be proven and specified in a step-by-step manner.

Therefore, in the medium term, it is necessary to focus on substantial and gradual improvement of the monitoring network (both groundwater and surface water) and database to ensure a more detailed approach to zone identification and monitoring, and thus achieve full compliance with the WFD with the identified nitrate vulnerable zones during the second cycle of the RBMP (2031-2036).

3.6. Vulnerable and less vulnerable areas identified in accordance with the criteria approved by the Ministry of Environment

As of 2023, no vulnerable or less vulnerable zones have been identified in Ukraine.

The regulatory document governing this issue is the Order of the Ministry of Ecology and Natural Resources of 14 January 2019 No. 6 (registered with the Ministry of Justice of Ukraine on 5 February 2019 under No. 125/33096) on approval of the Procedure for determining the population equivalent of a settlement and the Criteria for determining vulnerable and less vulnerable zones.

Also, in accordance with the Law of Ukraine On Water Disposal and Wastewater Treatment of 12 January 2023 (entered into force on 07 August 2023), Article 12. Powers of *local self-government bodies*, the powers of local self-government bodies in the field of water disposal include:

- upon the submission of the central executive body implementing the state policy in the field of water sector development, identification of vulnerable and less vulnerable zones in accordance with the criteria approved by the central executive body ensuring the formation of the state policy in the field of environmental protection.

The SAWR has prepared a submission to local authorities. However, due to the temporary occupation of the territory, the decision to recognise the SWBs as vulnerable zones cannot be made. In total, in the Azov Sea RBD proposes to recognise 40 SWBs as vulnerable zones.

4 MAPPING OF THE MONITORING SYSTEM, RESULTS OF MONITORING PROGRAMMES FOR SURFACE WATER (ECOLOGICAL AND CHEMICAL), GROUNDWATER (CHEMICAL AND QUANTITATIVE), AREAS (TERRITORIES) TO BE PROTECTED

4.1. Surface water

Surface water monitoring is carried out in accordance with the Procedure for State Water Monitoring, approved by CMU Resolution No. 758 of 19 September 2018. The Ministry of Ecology, the SAWR and the SES are the subjects of state water monitoring.

Every year since 2020, state water monitoring programmes have been approved by the relevant orders of the Ministry of Ecology (No. 410 of 31.12.2020, No. 3 of 05.01.2022, No. 27 of 17.01.2023) and enforced by the SAWR.

The state water monitoring programme includes:

- information on the object of state water monitoring (code, name of the object, location and other characteristics);
- biological, physicochemical, chemical and hydromorphological indicators, frequency of monitoring, information on the subject and the performer of water monitoring.

State water monitoring is carried out according to the indicators and frequency specified in Annexes 1-3 of the Procedure.

Depending on the goals and objectives of state water monitoring, the following procedures are established:

- the procedure for diagnostic monitoring of the SWBs and GWBs;
- Procedure for operational monitoring of the SWBs and GWBs;
- the procedure for research monitoring of the SWBs;
- procedure for monitoring marine waters.

Diagnostic monitoring is carried out during the first year of state water monitoring. For SWBs that do not pose a risk of failing to achieve environmental objectives, diagnostic monitoring is carried out additionally during the fourth year of state water monitoring.

Operational monitoring is carried out for SWBs that pose a risk of not achieving environmental goals, as well as for SWBs whose water intake to meet drinking and domestic needs of the population averages more than 100 cubic metres per day.

Operational monitoring is carried out annually between the years of diagnostic monitoring.

The research monitoring is carried out by the state water monitoring entities, which independently determine the monitoring points, the list of indicators and the frequency of their measurement.

4.1.1. Monitoring system

In the Azov sea river basin, surface water monitoring was carried out in 2023 at 19 sites located at 18 SWBs, including:

- 2 monitoring points have been installed at the SWBs, from which water is taken to meet the drinking and household needs of the population;
- 4 monitoring points in the protected areas.

4.1.2. Hydromorphological assessment / status

The hydromorphological status is assessed in accordance with the Methodology approved by Order of the Ukrainian State Geological Survey No. 23 of 19.02.2019, in five classes.

According to the assessment results, 9 SWBs are classified as nearly natural, 2 SWBs are classified as slightly modified, and 1 IPP is classified as slightly modified (Fig. 20)

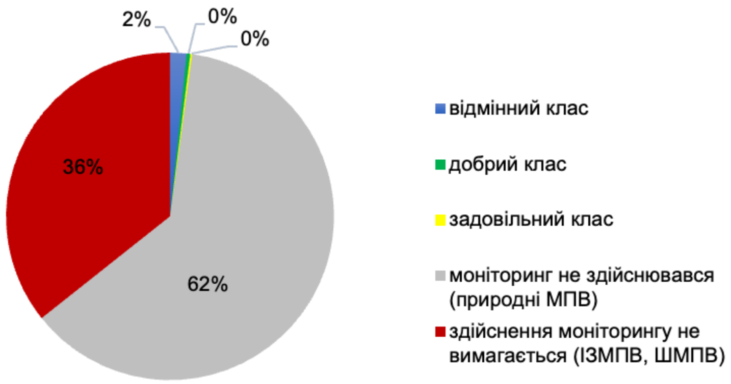


Figure 20. Distribution of SWBs according to the results of hydromorphological assessment

4.1.3. Chemical status assessment

The assessment of the chemical state of the SWBs is based on determining the concentrations of priority substances specified in Directive 2008/105/EC, taking into account Directive 2013/39/EU250, which sets the limit values of environmental quality standards.

In Ukraine, the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 45 of 6 February 2017, registered with the Ministry of Justice of Ukraine on 20 February 2017 under No. 235/30103, defines a list of indicators for which environmental quality standards are set in Annex 8 of the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 5 of 14.01.2019 No. 5 "On Approval of the Methodology for Assigning a Surface Water Body to One of the Classes of Ecological and Chemical Status of a Surface Water Body, as well as Assigning an Artificial or Significantly Modified Surface Water Body to One of the Classes of Ecological Potential of an Artificial or Significantly Modified Surface Water Body".

Directive 2009/90/EC (Article 5), which sets out technical requirements/criteria for the processing of monitoring data, was also taken into account when assessing the chemical state of the SWB:

- If the measured value was below the limit of quantification (LOQ), the calculation uses the value of half the LOQ for this indicator
- When summarising the results of individual isomers or mixtures (e.g. polycyclic aromatic hydrocarbons, cyclodiene pesticides, DDT), in the case of values measured below the LOQ, zero "0" should be used to calculate the average concentrations.

In addition, Article 4 of Directive 2009/90/EC stipulates that the methods for measuring the content of indicators must meet the minimum criteria: have a measurement uncertainty value below 50% (k=2) and a quantification limit equal to or below 30% of the relevant environmental quality standard.

Valuation reliability

The reliability of the chemical state assessment was performed using the criteria for establishing the reliability of the correct determination of the ecological and chemical status of the SWBs specified in Annex 11 of the Order of the Ministry of Ecology and Natural Resources of 14.01.2019 No. 5.

According to the established criteria, a three-stage scheme was used to assess the reliability of the correct determination of the chemical state of the SWB:

- A high level of assessment reliability means that most of the requirements have been met, namely: measurement data are available for all indicators specified in the List of Pollutants for Determining the Chemical State of Surface and Groundwater bodies and the Environmental Potential of an Artificial or Heavily Modified Surface Water Bodies in accordance with the Order of the Ministry of Environment No. 45 dated 6 February 2017, hereinafter referred to as the List, that meet the requirements of the Procedure (almost all relevant requirements for the list of indicators, methods and frequency have been met); the aggregation of SWBs demonstrates reliable results;
- The medium level of reliability of the assessment of the state of the SWB is established in the absence of sufficient monitoring data, frequency and measurement of all indicators identified in the List;
- The low level of reliability of the assessment of the state of SWB means that the assessment of the state of SWB was based on risk assessment, transfer of monitoring data through aggregation of SWB according to certain criteria.

To assess the chemical status of the SWBs, statistically processed data of measurements of the content of pollutants in the surface waters of the SWBs of the Azov River Basin conducted as part of the diagnostic monitoring programmes of surface water massifs at 19 monitoring sites in 2021-2022 were used, namely, the average and maximum values.

For SWBs that were not monitored in the reporting period, the chemical status was assessed by interpolating (transferring) the assessment results from SWBs that were monitored, according to the aggregation of SWBs.

From the List of indicators used to determine the chemical status of the SWBs in 2021-2022, measurements were carried out only for 37 substances and their groups, of which 4 are heavy metals.

The following parameters were not measured: brominated diphenyl ethers (esters), chloralkanes, C10-13, di-(2-ethylhexyl)-phthalate, diuron, isoproturon, pentachlorophenol, tributyltin compounds (tributyltin cation), perfluorooctane sulfonate and its derivatives (PFOS), dioxins and dioxin-like compounds, hexabromocyclo-dodecane (HBCDD).

For the indicators fluoranthene, hexachlorobenzene, hexachlorobutadiene, mercury and its compounds, dicofol, heptachlor and heptachloroepoxide, for which the recommended object of control is biota, due to the lack of technical capabilities and measurement methods, concentrations were determined only in surface water samples.

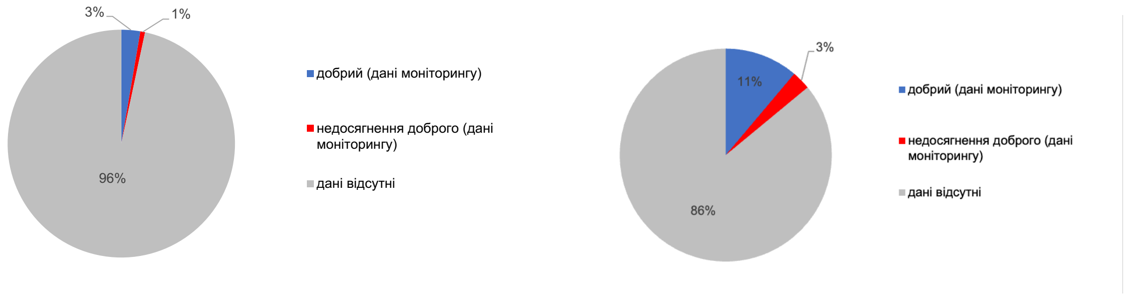
The reliability of the assessment of the correct determination of the chemical status of these SWBs is determined according to the criteria of Annex 11 of the Order and corresponds to the average level of reliability.

Based on the results of the assessment of the chemical status of the SWBs for the period 2021-2022 according to the monitoring data (Annex 8), the following conclusions can be drawn (Table 30, Fig. 21, Fig. 22):

- chemical status is "good" – 13 linear SWBs (3% of the total number of linear SWBs). In terms of length, this amounts to 490 km (11% of the total length of linear SWBs); 2 polygonal SWBs (2% of the total number of polygonal SWBs). In terms of the area of the SWBs, it is 7.4 km^2 (<1% of the total area of polygonal SWBs).
- chemical status "failure to achieve good" – 3 linear SWBs (<1% of the total number of linear SWBs). In terms of the length of the SWBs, this amounts to 125 km (3% of the total length of linear SWBs).

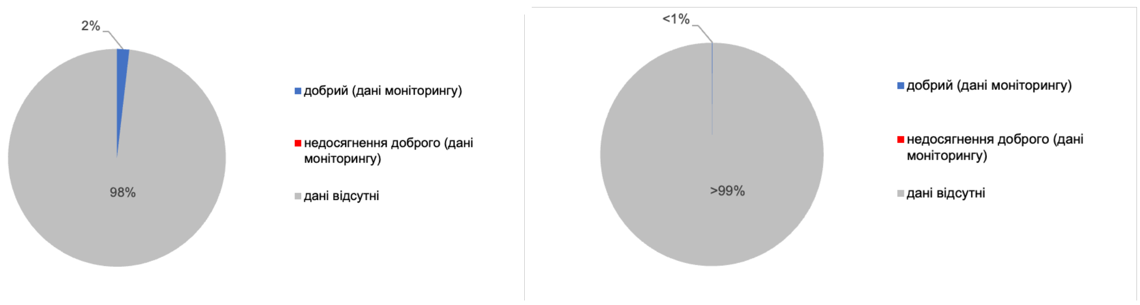
Table 30. Chemical status of the SWBs for the period 2021-2022 (according to monitoring data)

Chemical status	number of linear SWBs	total length of the SWBs, km	number of polygonal SWB	total area of the SWB, km^2
"good"	13	490	2	7,4
"failure to achieve the good"	3	125	0	0



a) by number *b) by total length*

Figure 21. Assessment of the chemical status of linear SWBs based on monitoring results



a) by number *b) by total area*

Figure 22. Assessment of the chemical status of polygonal SWBs based on monitoring results

The following substances have been found to exceed the EQS_{MAX} - maximum permissible concentration and/or EQS_{ave} - average annual concentration:

- fluoranthene (for 2 SWBs)
- pentachlorobenzene (for 1 SWB)
- benzo(b) fluoranthene (for 1 SWB)
- benzo(k) fluoranthene (for 1 SWB)
- Lucitrin (Irgarol) (for 1 SWB).

The interpolation of the results of SWB monitoring to other SWB was carried out on the basis of SWB aggregation, which was performed in 2022 as part of the implementation of state water monitoring in accordance with the Order of the State Agency of Ukraine for Water Resources dated 06.05.2022 No. 42 "On Approval of the State Agency of Ukraine for Research and Scientific and Technical Development Plan for 2022".

The purpose of SWB aggregation is to combine all SWB in a river basin into different groups based on reasonable criteria for:

- Interpolation of the results of monitoring of the SWB to other SWB that are grouped with them;
- Use the results of aggregation in the development of monitoring programmes for the following years to maximise the interpolation of the assessment results.

The criteria for the aggregation of SWB of the "rivers" and "lakes" category are:

- the type of the defined SWB;
- assessing the risk of not achieving a good chemical status of the SWB;
- a physical and geographical unit of zoning of the basin to which the SWB belongs;
- the type of landscape where the SWB is located.

The criterion for linear SWB of the "HMWB" and "AWB" categories is:

- assessing the risk of not achieving a good chemical status of the SWB.

The criteria for polygonal SWB of the " HMWB" and "AWB" categories are:

- category;
- the volume of the reservoir;
- water exchange regime of the reservoir.

Based on interpolation of the monitoring results according to the aggregation of the SWBs (low level of reliability of the condition assessment), the following results were obtained:

- chemical status is "good" – 169 linear SWBs (38% of the total number of linear SWBs). In terms of length, this amounts to 1364 km (31% of the total length of linear SWBs); 3 polygonal SWBs (3% of the total number of polygonal SWBs). In terms of the area of the SWBs, it is 12 km^2 (<1% of the total area of polygonal SWBs).
- chemical status "not achieving good" – 1 linear SWB (<1% of the total number of linear SWBs). In terms of the length of the SWBs, this amounts to 32 km (<1% of the total length of linear SWBs).

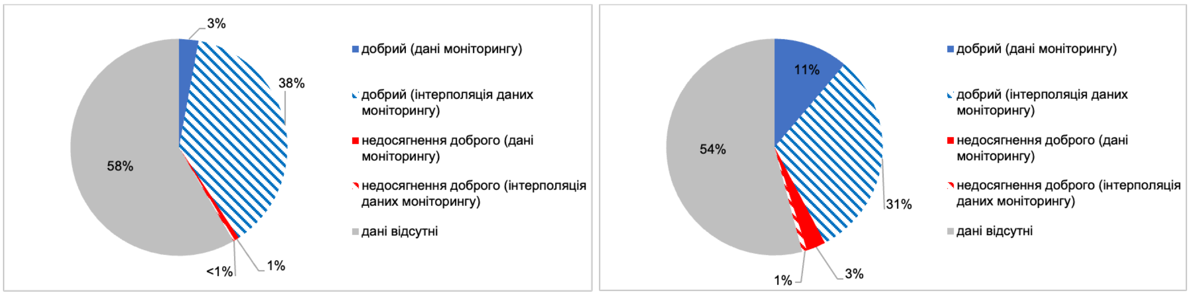
Table 31. Chemical status of the SWBs based on interpolation of monitoring data

Chemical status	number of SWB	total length of the SWB, km	number of SWB	total area of the SWB, km^2
"good"	169	1364	3	12
"failure to achieve the good"	1	32	0	0

The overall assessment of the chemical status of the SWBs is shown in Table 32 and Figure 23, 24.

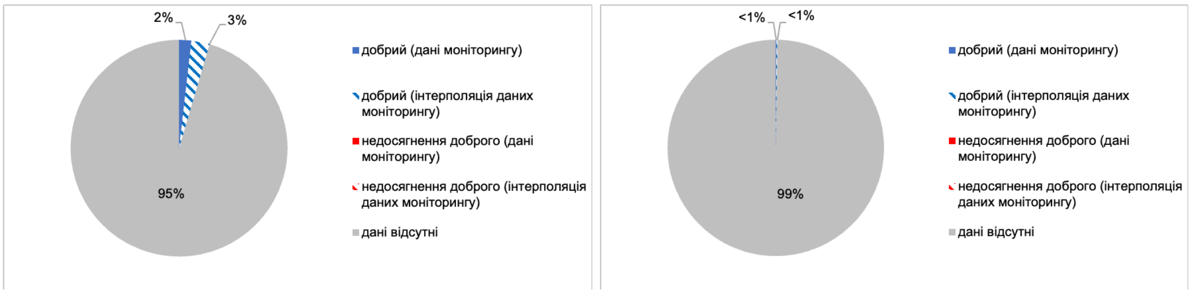
Table 32. Total assessment of the chemical status of the SWBs for the period 2021-2022 (monitoring data + interpolation of monitoring data)

Chemical status	number of SWB	total length of the SWB, km	number of SWB	total area of the SWB, km^2
"good"	182	1854	5	19,4
"failure to achieve the good"	4	157	0	0



by the number *by the length*

Figure 23. Total assessment of the chemical status of linear SWBs



by the number *by the area*

Figure 24. Total assessment of the chemical status of polygonal SWBs

Taking into account the interpolation of monitoring data, the chemical status was assessed for 191 SWBs, including 186 linear SWBs and 5 polygonal SWBs, which is 34% of all SWBs in the basin.

The reliability of the assessment of the correct chemical status determination for 18 SWBs was determined according to the criteria of Annex 11 of the Order and corresponds to the average level of reliability.

173 SWBs were assessed with a low level of assessment reliability based on the transfer of the results obtained under the surface water quality monitoring programme to SWBs where monitoring was not conducted in the specified period, according to the aggregation of SWBs.

4.1.4. Ecological status assessment

As of 2023, the ecological status of any of the SWBs was not determined. No biological indicators were monitored in 2021-2023.

4.1.5. Ecological potential assessment

As of 2023, the ecological potential of heavily modified and artificial SWbs has not been determined. No biological indicators were monitored in 2021-2023.

4.2. Groundwater

4.2.1. Monitoring system

The quantitative and chemical state of groundwater is monitored within the framework of the state groundwater monitoring system and changes in the state are predicted both under natural conditions and under the influence of human activity. Quantitative and chemical monitoring is carried out in the same observation wells. The monitoring is carried out in both non-pressure and pressure aquifers under natural, slightly disturbed and disturbed conditions. The disturbed conditions are investigated within the operational water intakes.

The state groundwater monitoring includes diagnostic and operational monitoring, the indicators and frequency of which are defined in accordance with the WFD and are listed in Annex 2 of the Procedure for State Water Monitoring (Table 33). The components of state monitoring of groundwater bodies include monitoring of quantitative, chemical and physico-chemical indicators. The Procedure for State Water Monitoring does not define the monitoring network (in particular, the number of monitoring points), but establishes the frequency and indicators to be monitored.

Table 33. Procedure for state water monitoring - Indicators and frequency of state monitoring of GWB

The subject of the monitoring	Name of the indicator	Frequency	Notes
Diagnostic monitoring*.**			
State Geological Survey	levels	one to three times a month	amount of water
	Temperature, redox potential permanganate oxidisability, mineralisation	at least twice a year	
	macro components: - Calcium, magnesium, sodium, potassium, hydrocarbonate ions, total ferric iron, - fluoride	four times a year	
	microcomponents	once a year	the list is determined taking into account the specifics of land use and indicators given in DsanPiN 2.2.4-171-10
	Pollutants according to the list of pollutants for determining the chemical state of surface and groundwater bodies and the environmental potential of artificial or significantly altered surface water bodies approved by the Ministry of Ecology and Natural Resources	four times a year	
	Specific synthetic pollutants (pesticides, pharmaceuticals and other substances)	once every two to six years	the list is determined taking into account the specifics of land use
	Specific non-synthetic pollutants (uranium, radium, radon and other substances)		
Operational monitoring***.			
State Geological Survey	Hydrogeological regime: groundwater levels	one to five times a month	
	total hardness, carbonate, non-carbonate mineralisation	quarterly, at least twice a year	
	phenols oil products synthetic surfactants	once every one to two years	
	macro components: hydrogen carbonate ions, calcium, potassium, magnesium sodium, silicon, total ferric, fluorine	quarterly, at least twice a year	
	microcomponents: aluminium, argentum, beryllium, cobalt, copper, manganese, molybdenum, nickel, selenium, strontium, chromium, zinc	once a year	The list of micro-components is determined taking into account the specifics of land use
	pollutants according to the list of pollutants for determining the chemical state of surface and groundwater bodies and the environmental potential of artificial or significantly altered surface water bodies approved by the Ministry of Ecology and Natural Resources	quarterly, at least twice a year	
	Specific synthetic pollutants (pesticides, pharmaceuticals and other substances);	once every six years	the list is determined taking into account the specifics of the array

The subject of the monitoring	Name of the indicator	Frequency	Notes
	Specific non-synthetic pollutants (uranium, radium, radon and other substances)		

** In the Exclusion Zone and the Zone of Unconditional (Mandatory) Resettlement of the Territory Affected by Radioactive Contamination as a Result of the Chornobyl Disaster, the State Agency of Ukraine on Exclusion Zone Monitoring of Groundwater Resources is responsible for monitoring groundwater resources.*

*** Data are updated and supplemented taking into account the specifics of the array.*

**** Data are updated and supplemented taking into account the specifics of the array and based on the results of diagnostic monitoring*

According to Geoinform, as of 01.01.2021, there were 55 observation points for state groundwater monitoring within the Azov sea River Basin, including 14 operating, 7 mothballed, 5 in need of repair, and the status of 29 observation points was unknown (25 of which were located in the uncontrolled territory at that time). Most of the basin is currently occupied.

Since the beginning of the Russian military aggression in 2022, the monitoring has been permanently suspended, as the implementation of the State Programme for the Development of Ukraine's Mineral Resources Base until 2030, which included monitoring and funding, was suspended.

The observation network for groundwater monitoring is currently in a dilapidated state. Observations conducted in 2018-2020 did not meet the requirements of the current Procedure for State Water Monitoring in terms of either quantitative or qualitative indicators.

4.2.2. Chemical assessment / risk assessment

Due to the lack of monitoring data, it is impossible to assess the current qualitative and quantitative status of the GWBs with sufficient reasonableness.

Based on the information from previous studies, it can be assumed that the water quality of non-pressure GWBs is most likely poor due to nitrogen pollution from diffuse sources within the agricultural landscape. As for the water of pressurised GWBs, its quality is mostly good, and the excess of the normative content of some components is of geogenic origin.

4.2.3. Estimation of groundwater volumes/reserves

As for the assessment of the quantitative status of non-pressure GWBs, due to insignificant water withdrawal, this state is obviously good. Some negative changes in this condition may be caused by global warming.

As for the pressure GWBs, according to expert data, the overall quantitative status of the identified GWBs can be preliminarily defined as good. The basis for this conclusion is a comparison of forecasted resources, operational groundwater reserves and data on current water withdrawal volumes.

Ways to restore and develop groundwater monitoring

The monitoring network needs to be restored and improved, which will be possible only after de-occupation. The placement of observation points should be based on the principle of representativeness, which in the case of groundwater involves taking into account the prevalence of GWBs and the homogeneity/homogeneity of natural and anthropogenic conditions of groundwater resource formation and their changes over time.

Given the long period of no monitoring and the limited number of observation points, it is necessary to conduct diagnostic monitoring of groundwater quality indicators of all identified GWBs at all observation wells. All designated and within the Azov Sea River Basin are subject to diagnostic and operational monitoring procedures, as all non-pressure GWBs are associated with surface ecosystems, while pressure GWBs are used for water supply to the population, and the average water withdrawal from them for drinking and domestic needs exceeds 100 cubic metres per year.

The Order of the Ministry of Environment No. 78 of 19.01.24 approving the State Water Monitoring Programme provides for groundwater monitoring in 2024, subject to the availability of funding for the relevant work. In the annex to the above-mentioned order, only 1 observation point is identified in the Pryazovia river basin (Table 34).

Table 34. Observation points (o.p.) for groundwater monitoring in the Azov river basin

Number of points in total	GWBs code	Name of the GWBs	Number of points on the GWBs
1	UAM6900Q100	Group of GWBs in alluvial quaternary sediments	1

After the de-occupation and cessation of hostilities, it will be necessary to conduct an inventory of observation wells, which will determine how many wells can be restored, need to be repaired, or conserved/liquidation tamponade; how many new observation points will need to be set up.

In the future, the priority is to resume groundwater monitoring.

As intensive agricultural production is carried out within the basin, and according to available data, the waters of non-pressure GWBs are widespreadly contaminated with nitrogen compounds, special attention should be paid to improving the quality of non-pressure GWBs. One of the problems is that the existing observation points for non-pressure GWBs are wells located within rural settlements. The information obtained during the inspection of wells sometimes reflects the contamination of the water intake facility, not the aquifer. At the same time, there are virtually no observation points - wells that are better protected from surface contamination and points located within areas with minimal anthropogenic load - that would allow determining the background levels of chemical elements and compounds in the water of non-pressure GWBs.

Obtaining information on background areas would allow more reasonable determination of the quality of non-pressure GWBs and assessment of the risk of their failure to achieve environmental objectives. Obviously, if appropriate funding is available, it is necessary to include new observation points located in protected areas in the monitoring network, and, if possible, to construct new ones (drilling wells) in representative areas that would allow obtaining information that could reasonably be extrapolated to large areas of groundwater distribution

Protected areas (territories)

The State Water Monitoring Programme for 2023 for the Azov sea River Basin includes monitoring points within two categories of protected areas (territories):

- 3 monitoring points related to operational monitoring at SWBs from which water is abstracted to meet the drinking and household needs of the population (Annex 6);
- 4 monitoring points at SWBs located within the Emerald Network facilities as part of diagnostic monitoring (Annex 6).

5 A LIST OF ENVIRONMENTAL OBJECTIVES FOR SURFACE WATER, GROUNDWATER AND PROTECTED AREAS (TERRITORIES) AND DEADLINES FOR THEIR ACHIEVEMENT (IF NECESSARY, JUSTIFICATION FOR SETTING LESS STRINGENT TARGETS AND/OR POSTPONEMENT OF THEIR ACHIEVEMENT).

Environmental objectives for surface water, groundwater and protected areas (territories) are set separately.

Surface water:

- Prevention of deterioration of all SWBs;
- Achievement/maintenance of good ecological and chemical status of all natural SWBs (rivers, lakes, transitional and coastal waters);
- Achieving/maintaining good ecological potential and chemical status of HMWBs and AWBs;
- Gradual reduction to the complete absence of hazardous substances.

Groundwater:

- Prevention of deterioration of all GWBs;
- Achieving/maintaining good quantitative and chemical status of all GWBs;
- Preventing and limiting groundwater pollution.

Areas (territories) to be protected:

Achieving standards and targets as required by applicable law for:

- Emerald Network facilities;
- sanitary protection zones;
- protection zones for valuable aquatic bioresources;
- surface/ground water bodies used for recreational, medical, resort and health purposes, as well as water intended for bathing;
- areas vulnerable to (accumulation of) nitrates;
- vulnerable and less vulnerable areas identified in accordance with the criteria approved by the Ministry of Environment.

In cases where several objectives are set for a particular SWBs or GWBs, the most stringent ones should be applied, while all other objectives should also be met.

In some cases, the deadlines for achieving environmental objectives or the targets themselves may be postponed as an exception.

It is allowed to postpone the date of achievement of the objective for a period of 6 years (until 2036), but not longer than 12 years (until the end of 2042) from the end of the implementation of the first cycle of the RBMP (2030).

An exemption applied to a particular SWB or GWB should not create a risk of not achieving the environmental objectives of the upstream (for SWB) or downstream (for SWB) and adjacent (for GWB) body or bodies.

The exceptions include:

- **Achieving less stringent objectives or postponing the date of their achievement** due to technical reasons (e.g. lack of a technical solution, technical impracticality or impracticability), disproportionately high cost or the existing natural state of the water body that does not allow for its improvement in a timely manner (e.g. inert groundwater to be restored). The presence or absence of disproportionality is determined by the results of an economic assessment of costs and benefits;
- **Temporary deterioration of the status (objectives) as a result of an unforeseen force majeure of** natural origin (e.g. extreme flood, drought) or anthropogenic (accident);
- **New physical changes to the SWB as a result of infrastructure projects** are permitted if the benefits to society are higher than the environmental benefits and there is no other option to avoid these changes for technical and/or financial reasons. Water pollution from point or diffuse sources is not allowed.

Environmental objectives for surface water

Based on the results of an assessment of the anthropogenic impact on the SWBs of the Azov Sea River Basin:

- 166 SWBs are not at risk of failing to achieve good ecological status/potential, 43 SWBs are possibly at risk, and 346 SWBs are at risk.
- 501 SWBs are not at risk of not achieving good chemical status, and 54 SWBs are possibly at risk.

Good ecological status/potential by 2030 will be achieved by 183 SWBs, of which 161 SWBs are currently not at risk (they need to maintain this status), 22 SWBs are 5% of SWBs that are at risk or possibly at risk of not achieving environmental objectives based on the results of the anthropogenic pressures assessment and will achieve environmental objectives through the implementation PoM.

The remaining at-risk or potentially at-risk SWBs in the basin (372 SWBs) could reach good ecological status/potential by 2036 or 2042 with the implementation of the PoM.

By 2030, 501 water bodies will have reached good chemical status, including those that are currently at no risk (they need to maintain this status), while 54 water bodies that are at risk according to the results of an assessment of anthropogenic pressures will achieve the environmental objectives no earlier than 2036 or 2042, provided that environmental protection measures are implemented.

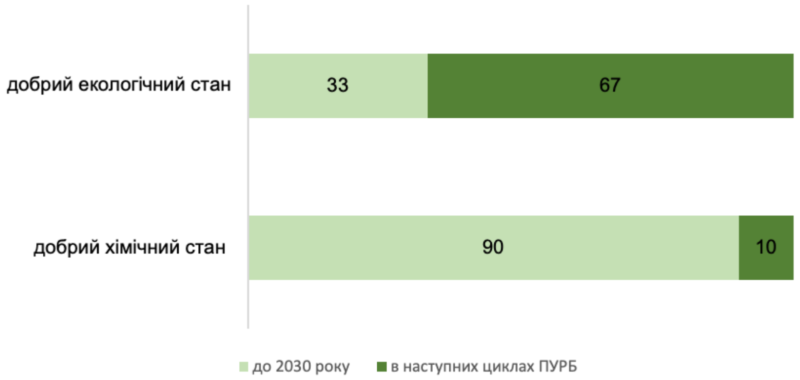


Figure 25 Timeframe for achieving the environmental objectives of the SWBs

Annex 8 (Table 1) lists the environmental objectives of the SWBs, the timeframe for achieving them, reasons for postponement and setting less stringent objectives.

Environmental objectives for groundwater

Environmental objectives are set for each GWBs in terms of both their quantitative and qualitative (chemical) status. According to the WFD, the main objective is to achieve good groundwater status.

Additional objectives for each individual GWB are set depending on the existing quantitative and qualitative state of the GWB, their use or potential use for public water supply, anthropogenic pressure and possible impact on surface ecosystems.

The main criterion for the good quantitative status of the GWB should be the absence of groundwater depletion.

Depletion is the state of aquifers in which, under the influence of artificial drainage, the decline in groundwater levels has reached such indicators that exclude the possibility of further use of the horizon to meet the needs of society using traditional technical means.

The assessment of the depletion of the GWB is based on information on the level regime, data on groundwater extraction volumes and their comparison with the resources and approved operational reserves.

In addition, for non-pressure GWB, the criterion of good condition is the appropriate condition of the associated surface water bodies and the absence of negative impact on surface ecosystems, primarily vegetation suppression.

The criteria for the good quality (chemical) status of the GWB are the natural background content of chemical elements and compounds, as well as the standards set for drinking water by the State Sanitary Norms and Rules "Hygienic Requirements for Drinking Water Intended for Human Consumption" (SanPiN 2.2.4-171-10).

Quantitative status of non-pressure GWBs

The environmental objective is to avoid groundwater depletion and not to deteriorate the quantitative state. Given the extremely limited monitoring data, it can be concluded that, given the insignificant volumes of water extraction from non-pressure GWB by private water consumers, negative trends in the quantitative state are not expected.

Qualitative (chemical) status of non-pressure GWBs

The non-pressure GWB in the basin are unprotected and conditionally protected.

Non-pressure GWB are used by the rural population to meet their drinking needs, therefore, to assess the quality state, the standards of Sanitary and Epidemiological Norms 2.2.4-171-10 should be used, except for those elements and compounds whose content exceeds the normative value in the natural state. For such components, the values of natural backgrounds should be used.

The environmental objective is compliance with Sanitary and Epidemiological Norms 2.2.4-171-10 and no deterioration of the quality state. However, it should be noted that the stability of the quality state is relative, and the content of macro- and micro-components in the water of non-pressure GWB is subject to significant fluctuations in space and time, so it is necessary to have information on the intervals of changes in the content and to refine it in the course of monitoring.

Quantitative status of pressure GWBs

The quantitative state of the pressure GWB is assessed by analysing the level regime and comparing the volumes of water withdrawal from these GWB at water intakes with the volumes of OGR and FGR.

The environmental objective is the stability of the quantitative state and the absence of groundwater depletion. At groundwater abstractions, the volume of water withdrawal should not exceed the estimated operational reserves (within groundwater deposits).

The basin's groundwater is used for water supply, including centralised water supply, and is therefore subject to pressure. However, groundwater extraction does not exceed the value of forecasted resources and operational groundwater reserves. Groundwater exploitation has not led to significant changes in the water level regime, and the reduction of the operational load in recent years has contributed to the recovery of water levels.

Chemical status of pressure GWBs

Under natural conditions, the injection water treatment plants are protected from pollution from the surface. However, in some areas, spotty groundwater contamination with nitrogen compounds is periodically observed, which may indicate the inflow of contamination from overlying aquifers through defective wells.

Since groundwater from all the pressure GWB is used for centralised drinking water supply to the population, the criteria for good chemical condition were chosen to be the compliance of groundwater chemical parameters with the State Sanitary Norms and Rules "Hygienic Requirements for Drinking Water Intended for Human Consumption" (SanPiN 2.2.4-171-10).

An additional environmental objective is to avoid deterioration in the quality of the discharge GWB, but conclusions on trends in chemical composition should be based on reliable monitoring data, since the content of components in water is subject to significant natural fluctuations. Therefore, for each GWB, it is necessary to have information on the interval of changes in the content of water chemical components.

The poor state of groundwater monitoring over the past decades, and, consequently, insufficient information on the current state of the GWB, allows defining environmental objectives only in the most general form. In the course of monitoring, the environmental objectives for each GWB will be refined.

Table 2 of annex 8 shows the environmental objectives of the GWB and their groups, the timeframe for achieving them, reasons for postponement and setting less stringent objectives.

It should be noted that the improvement of the status of non-pressure GWB under the conditions of implementation of measures to reduce the impact of diffuse sources of pollution should be expected much later than the improvement of the status of surface water bodies due to their position in the geological environment and a significant amount of accumulated pollutants (primarily nitrates). Given the current situation and a realistic forecast of when large-scale environmental protection measures could be implemented, such improvement should not be expected before 2042.

All 15 of the currently identified GWB and their groups will reach good quantitative status by 2030, and 11 will reach good chemical status (73% of the identified GWB and their groups). The remaining 4 groups of GWB (non-pressure) are projected to reach good chemical (qualitative) status no earlier than 2042 (Fig. 26), provided that large-scale measures are taken after de-occupation to reduce the load from diffuse sources of pollution within agricultural landscapes.

Figure 26. Timeframe for achieving the environmental objectives of the GWBs

6 ECONOMIC ANALYSIS OF WATER USE

The economic analysis of water use has been prepared in accordance with the schedule of the RBMP development process based on data for 2015-2019. Due to the full-scale military invasion of Ukraine by the Russian Federation, the economic development of the territories and the structure of water use in the Azov Sea river basin have undergone significant changes.

6.1 Economic development of the basin area

The Azov Sea River basin is an industrially developed region, where socio-economic positions are shaped by both water-dependent industries (primarily processing and mining, agriculture) and industries that are not the main water users (trade, public administration, services, etc.).

Geographically, the basin partially covers three oblasts: Donetsk, Zaporizhzhya and Kherson, and the total population of these regions of the river basin is 1,284,967 people, which is 3.08% of the total population of Ukraine (Table 35).

Table 35. Population of the Azov sea River basin area, as of 01.01.2020[7]

Indicators	2019
Total population, people	1 284 967
Share of the river basin population in the total population of Ukraine, %.	3,08
Basin population by region	
Population of Donetsk region, people	581 688
Share of the population of Donetsk region in the total population of the basin, %.	45,27
Population of Zaporizhzhia region, people	554 602
Share of Zaporizhzhia Oblast population in the total population of the basin, %.	43,16
Population of Kherson region, million people	148 677
Share of the population of Kherson region in the total population of the basin, %.	11,57

The structure of the employed population is also of interest for analysing the socio-economic situation in the basin. Thus, the proportion of the population living within the basin has a high degree of employment in water-dependent sectors of the economy - 12.4% (159,127 people), including: industry - 5.8%, agriculture - 4.8%, transport - 1.8%.

The share of the basin's employed population in water-dependent sectors of the economy in the total number of employed people in Ukraine is 0.96%.

The structure of population distribution in the basin is dominated by urban population, with its share ranging from 61-91% (Donetsk - 91%, Zaporizhzhia - 77%, Kherson - 61%), while the average value of this indicator in Ukraine is 70%. This distribution indicates a high level of urbanisation in the basin, which in turn means a significant pressure on water resources and high water consumption.

Analysis of the GRP of the Azov Sea River basin regions

In 2019, the GRP in the basin amounted to UAH 79.414 billion, which is 2% of Ukraine's total GDP.

In terms of the basin's regions, the highest GRP share is in Zaporizhzhia region (57.4%), lower in Donetsk region (32.5%), and the lowest in Kherson region (10.1%) (Table 36).

Table 36. Dynamics of the basin's GRP, 2015-2019[8]

Indicators	2015	2016	2017	2018	2019
GRP in actual prices, UAH million	42 969	51 326	63 671	73 526	79 414
Share of river basin GRP in the total GDP of Ukraine, %	2,16	2,15	2,13	2,07	2,00
GRP growth rate of the river basin, % compared to the previous year	100,0	119,4	124,1	115,5	108,0

The dynamics of the basin's GRP indicator has a positive trend, with an increase in GRP from UAH 42.969 billion in 2015 to UAH 79.417 billion in 2019.

The GRP per capita within the basin in 2019 was UAH 61,802 thousand, which is lower than the average for the whole of Ukraine (as of 2019, the GRP per capita according to the authors' calculations is UAH 87 thousand).

[7]Source: calculated on the basis of data from the State Statistics Service of Ukraine http://www.ukrstat.gov.ua/
[8] Source: calculated on the basis of data from the State Statistics Service of Ukraine http://www.ukrstat.gov.ua/

GRP per capita by region: Zaporizhzhia region - UAH 92.04 thousand per capita, Kherson region - UAH 60.36 thousand per capita, Donetsk region - UAH 49.78 thousand per capita.

Analysis of GVA in the basin

GVA in actual prices is UAH 66.194 billion for the basin (Table 38), or 1.93% of GVA in Ukraine as a whole.

The growth rate of the basin's GVA is increasing.

In the structure of the GVA, some types of economic activity, those that are the largest water users, are singled out and their share in the total volume of the GVA of Ukraine is calculated.

Table 37. GVA of water-dependent industries in the basin, 2019.[9]

Water-dependent sectors of the economy	GVA, billion UAH	Share in Ukraine's GDP, %	Share in the basin's GVA, %
Agriculture, forestry and fisheries	7,163	0,21	19,44
Mining and quarrying	7,661	0,22	20,79
Processing industry	14,884	0,43	40,40
Supply of electricity, gas, steam and conditioned air	3,966	0,12	10,77
Water supply; sewerage, waste management	0,321	0,009	0,87
Transport, warehousing, postal and courier services	2,848	0,08	7,73
Total for the basin	**36,843**	**1,07**	**100**

The total share of water-dependent economic activities in the river basin in Ukraine's total GVA was 1.07% in 2019, which indicates a slight slowdown in economic development compared to 2015, when this figure was 1.23%.

In the overall structure of Ukraine's GVA, agriculture, forestry and fisheries within the basin account for 0.21%, mining and quarrying account for 0.22%, manufacturing 0.43%, electricity, gas, steam and air conditioning 0.12%, water supply, sewerage, waste management 0.009%, and transport, warehousing, postal and courier services 0.08%.

Among other non-water-dependent economic activities (shown in grey in Figure 27) that contribute to the basin's GVA, we should highlight the industries that have a high aggregate share in the overall GVA structure, namely: wholesale and retail trade, repair of motor vehicles and motorcycles, information and telecommunications, real estate transactions, public administration and defence, compulsory social insurance, and education.

The total amount of GVA of water-dependent economic activities in the basin in the total amount of GVA in the basin during 2015-2019 ranged from 55.7-61.8% (in 2019 - UAH 36.8 billion, which is 55.7%).

In the overall structure of GVA by type of economic activity, the largest total share of water-dependent economic sectors is in Zaporizhzhya Oblast (55%). The total share of water-dependent economic sectors in the GVA structure of the part of Donetsk Oblast that is part of the basin is rather high - 36%. The lowest total share of water-dependent economic sectors in the GVA structure is in Kherson Oblast - 9% (Fig. 27).

Figure 27. Structure of the GVA of the regions within the Azov River basin, 2019, %.[10]

[9] Source: calculated on the basis of data from the State Statistics Service of Ukraine http://www.ukrstat.gov.ua/
[10] Source: calculated on the basis of data from the State Statistics Service - Regional Statistics, available at: www.ukrs- tat.gov.ua

6.2 Characteristics of modern water use

The description of the current water use in the basin area was made on the basis of the state water cadastre data in the section "Water use" for 2019.

The volume of water withdrawal in the basin is 1236.0 million m^3 , which is 11% of the total volume of water withdrawn in Ukraine.

An analysis of water intake volumes in 2015-2019 shows a simultaneous trend of growth and decrease in demand for water resources in recent years. The volume of wastewater discharges in 2019 decreased compared to 2015-2018.

Surface water is the main source of water (96.8%) and only 3.2% of water withdrawals are groundwater. The main sources of water resources are the Azov Sea coast (1044 million m^3 - 84.5%) and the Kalchik River, which directly withdraws 86.74 million m^3 (7% of the total water intake in the basin).

The main water users within the basin are industry, agriculture and housing and communal services.

In terms of regions, the leader in water abstraction is Donetsk region (52%), followed by Kherson region (40%), and Zaporizhzhia region (8%).

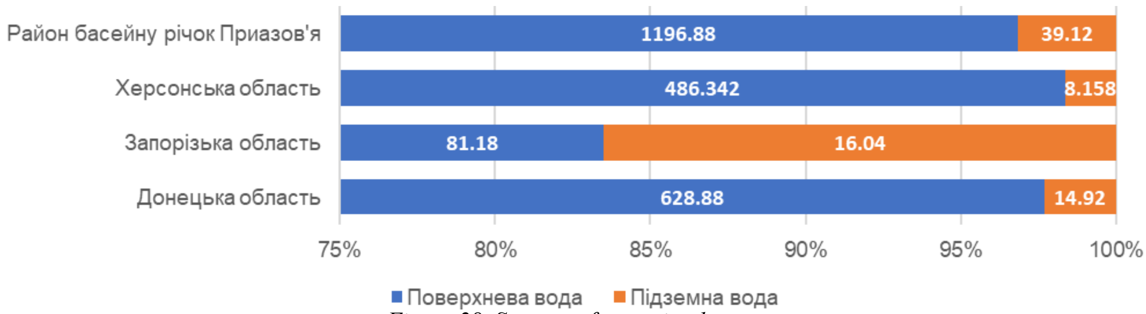


Figure 28. Sources of water intake

The largest percentage of water resources is withdrawn by agriculture (47.3%), a significant portion by industrial water users (44.6%), housing and communal services (8%), and less than 0.1% by other sectors. The volume of water use is shown in Fig. 29.

Figure 29. Characteristics of water use in the Azov River basin[11]

A more detailed description of water use in the Azov sea river basin is presented in Annex 9.1.

In terms of wastewater disposal, 88.7% of wastewater is discharged into surface waters by industrial water users, almost 11% by housing and communal services and 0.4% by agriculture.

The largest percentage of wastewater discharge (97.9%) is in Donetsk Oblast, 1.8% in Zaporizhzhia Oblast and 0.3% in Kherson Oblast.

62.9% of the wastewater discharged is normatively clean without treatment, with only 5.6% being polluted wastewater.[12]

The bulk (99.5%) of polluted wastewater comes from water users in the housing and utilities sector, with 0.23% discharged by industrial enterprises.

[11] Data source: State water cadastre data, section "Water use", 2019, State Agency of Water Resources of Ukraine
[12] Categories of wastewater in accordance with the Procedure for maintaining state water accounting

Information on wastewater discharges into water bodies by categories of discharged water is provided in Annex 9.2.

The socio-economic importance of water for economic sectors was assessed on the basis of the European methodology for assessing the value of water[13] . The ranking of economic sectors by 5 indicators of economic and resource areas, which are adapted in accordance with the recommendations of the methodology, was applied, namely

- GVA generated by the industry is an economic indicator of the sector's weight in the region's economy;
- the volume of water withdrawn by the industry;
- water intensity of the industry compared to other industries;
- The industry's dependence on water quality;
- pollution of water bodies by the industry's waste water.

Table 38. Water use and water intensity of GVA of the basin's economic sectors

Industry sector	Water intake, mln m^3	GVA, UAH mln	Water intensity of GVA, m^3 /1000 UAH
Industry	550,6	26 511	20,77
Housing and utilities	99,2	321	309,03
Agriculture	584,3	7 163	81,57
Transport	0,121	2 848	0,04
In the whole basin	**1236,0**	**66 194**	**18,67**

The water-dependent sectors of the economy were assessed for each indicator and its socio-economic weight was determined as low, moderate or high.

Table 39. Socio-economic weight of the main water users

Sectors of the economy	Scope of GVA creation	Water intake by the industry	Water intensity of the industry	Dependence on water quality	Waste water pollution
Electricity	moderate	high	low	low	low
Ferrous metallurgy	high	high	low	low	low
Chemical industry news	moderate	low	moderate	low	low
Mechanical engineering and metalworking	moderate	moderate	low	low	moderate
Food processing industry	moderate	moderate	low	high	moderate
Coal mining news	high	low	low	low	low
Housing and utilities	low	high	high	high	high
Fisheries	moderate	moderate	moderate	moderate	low
Irrigation	moderate	high	moderate	low	low
Other types of agriculture (including livestock and crop production)	moderate	low	moderate	high	low
Transport	moderate	low	low	low	low
Recreation and security health	low	low	low	high	low

Based on the assessment results, economic sectors are grouped into 5 groups according to their dependence on water resources and socio-economic importance.

Group 1 "Full dependence" includes water users that are highly dependent on 4 indicators - water quality, high water intensity, significant pressure on water resources and small volumes of water supply - housing and communal

[13] "The Economic Value of Water - Water as a Key Resource for Economic Growth in the EU "http://ec.europa.eu/environment/blue2_study/pdf/BLUE2%20Task%20A2%20Final%20Report_CLEAN.pdf

services.

Group 2 "Multiple dependence" - highly dependent on at least two indicators - includes ferrous metallurgy.

Group 3, "Specific dependence", includes the electricity, coal and food industries, recreation and healthcare, irrigation and other types of agriculture, which have high dependence on one indicator.

Group 4, "Moderate dependence", includes the fishing industry, machine building and metalworking, and the chemical industry, which have moderate dependence on at least 2 indicators.

Group 5 "Dependence without water use" includes economic sectors that use water without abstraction from natural water bodies, generate low volumes of GDP and are minor polluters.

The assessment showed that the housing and utilities sector is completely dependent on water resources and is the most water-intensive sector of the economy.

The level of water availability in the river basin per capita is 0.962 thousand m^3, which is below the minimum level of water availability according to the UN classification (1.7 thousand m^3 per person per year).

6.2.1. Municipal water use

The needs of the housing and communal sector are mainly to meet the drinking and domestic needs of the population and are covered by 76.27% from surface sources and 23.73% from groundwater sources. Water users in the housing and communal sector abstracted 99.2 million m^3 - 8% of the total abstraction.

The main water users in the municipal sector are enterprises:

Berdianskvodokanal of the Berdiansk City Council of Zaporizhzhia Oblast provides water from mixed sources (artesian wells, the Berda River and the network of the Oblavvodokanal of Zaporizhzhia Oblast, the Western Group Water Supply Workshop) to the population, enterprises, institutions and organisations of Berdiansk - 1.342 million m^3 ;

Vodokanal of the Melitopol City Council of Zaporizhzhia Oblast provides 6.506 million litres of water from underground sources (artesian wells) to the population, enterprises, institutions and organisations of Melitopol^3 ;

The Municipal Enterprise "Miskvodokanal" of the Tokmak City Council of Zaporizhzhia Oblast provides 0.946 million litres^3 of water from underground sources (artesian wells) to the population, enterprises and organisations of Tokmak;

Akimzhilservis LLC provides water from underground sources (artesian wells) to the population, enterprises, institutions and organisations of Yakymivka - 0.503 million m^3;

Zhilkomservis LLC of the Kyrylivka Village Council provides 0.512 million m^3 of water from underground sources (artesian wells) to the population, enterprises, institutions and organisations of Kyrylivka village;

The Mariupol Regional Water Supply Department of the Water of Donbass Company provides 30.58 million cubic metres of water from mixed sources (Azov rivers) to the population, enterprises, institutions and organisations of Mariupol;

Genichesk Production Department of Water Supply and Sewerage provides 0.861 million m^3 of water from underground sources (artesian wells) to the population, enterprises, institutions and organisations of Genichesk.

The bulk of water resources (49% of water withdrawals) is used for production needs and (43%) for irrigation.

The peculiarity of municipal water use is significant water losses (58.5% of water intake by municipalities / 140.1 million m^3) due to the unsatisfactory condition of water supply systems. This percentage of water losses is critical for the water supply infrastructure.

The housing and utilities sector is the largest polluter of surface water, discharging 99.5% of polluted wastewater in the Pryazovia River basin due to inefficient or non-existent wastewater treatment facilities.

The following companies are the largest polluters in the housing and utilities sector:

- ME "Berdianskvodokanal" of the Berdiansk City Council of Zaporizhzhia Oblast - 4.816 million m^3 (14.08% of the volume of polluted water in the basin)
- Municipal enterprise "Vodokanal" of the Melitopol City Council of Zaporizhzhya region - 3.810 million m^3 (11.14% of the volume of contaminated water in the basin);
- Mariupol ME "Water of Donbass" - 3.632 million m^3 (10.62% of the volume of contaminated water in the basin);

- Akimzhilservice LLC, Melitopol district - 0.069 million m^3 (0.2% of the volume of contaminated water in the basin).

6.2.2. Industrial water use (by major water users)

Industrial water use is predominant in Donetsk Oblast.

The main water users in the industrial sector in the Pryazovia river basin within the Donetsk Oblast are ferrous metallurgy enterprises.

26 industrial water users use water in the Azov River Basin within the Donetsk Oblast with a total water withdrawal from natural water bodies of 549.9 million m^3, including by water supply source: fresh water - 59.42 million m^3 (11%), including: surface water - 49.38 million m^3 (83%), underground water - 10.04 million m^3 (17%), of which 7.978 million m^3 of mine and quarry water (79%). Sea water - 490.5 million m^3 (89%).

The main industrial water users in the Pryazovia river basin within Zaporizhzhia oblast are machine building, food and meat and dairy industries, and food industry enterprises within Kherson oblast.

The largest industrial water users, withdrawing 43.8% of the total water use in the river basin, are enterprises in Donetsk Oblast - Azovstal Iron and Steel Works (490.5 million m^3) and Mariupol Ilyich Iron and Steel Works (51.34 million m^3). The volume of water use is higher than the water withdrawal due to the use of recycling cycles in the industry.

In 2019, industrial water users in the river basin discharged clean water into water bodies. A total of 539.9 million m^3 of waste water was discharged into surface water bodies, of which only 0.01% was polluted.

The main polluters in the industry are Melitopol Oil Extraction Plant LLC, Akimzhilservice LLC in Yakymivka, and Marist Trade LLC in Mariupol.

Water users in the industrial sector discharge hazardous pollutants such as phenols, oil products, surfactants, iron, methanol and lead into surface water bodies with wastewater. Pollutant discharge regulations do not take into account the specifics of industrial water users' technological cycles and result in a lack of control over the flow of hazardous pollutants into water bodies.

6.2.3. Water use in agriculture

Water use in agriculture is mainly from mixed sources. The total water withdrawal for agricultural needs is 584.3 million m^3 (47.27% of the basin's water withdrawal), including 580.8 million m^3 from surface sources and 3.504 million m^3 from groundwater sources. The volume of water abstraction from water bodies without withdrawal is 55.72 million m^3 .

The main water users in the agricultural sector in the Pryazovia river basin are agricultural enterprises, fisheries and horticultural associations.

Irrigation prevails in the structure of water withdrawals by agriculture, accounting for 97% of agricultural water withdrawals.

As a result of climate change and adaptation of agricultural water users, there has been a slight increase in the area of irrigated land in the Pryazovia River basin (from 219.84 thousand hectares in 2018 to 221.85 thousand hectares in 2019). In 2019, water users used 534.0 million m^3 (91.4% of water withdrawals by agriculture) for irrigation purposes, which is 223 agricultural producers.

Crop production uses 3.415 million m^3, including 1.6 million m^3, and livestock - 0.278 million m^3, including 0.278 million m^3. Wastewater was discharged to surface water bodies by 3 water users (1 in Zaporizhzhia region - 0.569 million m^3 and 2 in Kherson region - 1.480 million m^3) with a discharge volume of 2.049 million m^3 (normatively clean without treatment).

The growth of irrigation and the pressure on water resources requires compliance with the requirements and control of the quality of the water used.

6.2.4 Water use in transport

Water use in transport does not put a significant burden on the Pryazovia river basin, as water use by transport sector users in 2019 amounted to 0.03% of the total water withdrawal (0.368 million m^3 of water). These are mainly drinking and sanitary needs - 0.248 million m^3 , production needs account for only 0.12 million m^3 of water. In 2019, transport users abstracted 0.119 million m^3 from groundwater sources.

The Group discharged 0.164 million m^3 of wastewater into surface water bodies, including 0.036 million m^3 of polluted water, 0.020 million m^3 of standard clean water without treatment, and 0.1 million m^3 of standard clean water treated at treatment plants.

6.2.5 Other types of water use

Other types of water use withdraw water in the amount of 0.062% of the total water withdrawal in the river basin.

These industries include trade and catering, logistics, construction, communications, healthcare and physical education, and public education.

Water users in these sectors of the economy do not exert significant pressure on the state of the river basin's waters.

6.3. Forecast of water demand by major economic sectors

The water demand of the main sectors of the economy is forecasted for the period of the RBMP (until 2030) under three scenarios: realistic, optimistic and pessimistic.

The forecast is based on the economic indicators of GDP/GRP for previous years and their forecast values. The increments of the optimistic and pessimistic scenarios were calculated by determining the average annual deviations from the forecast values for the previous years.

The deviation of the projected water withdrawal volumes under the pessimistic scenario ranges from 0.6-5.1% of the realistic scenario. The optimistic scenario shows a maximum increase in the projected demand for water resources by 0.3-1.5% compared to the realistic scenario.

2020 was a year of significant decline in economic indicators and, accordingly, in water intake.

The main factors affecting water use in the Azov Sea basin include the following:

- the spread of COVID-19 coronavirus infection and the introduction of restrictive measures;
- economic development - driving sectors: industry and agriculture;
- Natural: climate change → increased irrigation.

Forecasting of water withdrawal for the short-term period - for 2021 - was made on the basis of the Forecast of Economic and Social Development of Ukraine for 2021-2023 values for 2030 were made on the basis of the Forecast of Economic and Social Development of Ukraine for 2022-2024 of the Ministry of Economy, Trade and Agriculture of Ukraine[14] and forecast values of world development indicators of the World Bank, international financial statistics of the International Monetary Fund (IMF), IHS GlobalInsight and Oxford Economic[15] .

A number of data were calculated by determining the relationship between GDP and water withdrawals in the Azov River basin in 2015-2019 and based on the water content per unit of GDP. Based on these calculations, a forecast was made for the growth of water withdrawal by the main sectors of the economy in the Azov sea river basin under a realistic scenario until 2030.

Under the baseline (realistic) scenario, the economy is expected to resume a positive trend after the significant losses caused by the COVID-19 pandemic in 2020, and GDP growth is forecast at 3.7% in 2022, 3.5% in 2023, and 3.9% in 2024[16] .

Industrial production indices and volumes of water-dependent sectors of the economy are expected to decline further, in particular in the mining and quarrying industry, production, supply and distribution of electricity, gas, and light industry.

The largest decrease is expected in the industry and municipal sector, which are the main water users in the Azov sea river basin. Almost constant abstraction rates are observed in the agriculture and transport sectors.

2021 - 2025 - a slight fluctuation in water intake is expected within 1%.

2025 - 2030 - the trend of intensive growth in water intake due to the projected economic growth of 3.4% annually.

[14] https://www.me.gov.ua/Documents/Detail?lang=uk-UA&id=98c3a695-56bb-42ba-b651-60ce1f899654&title=PrognozEko-nomichnogoIsotsialnogoRozvitkuUkrainiNa2021-2023-Roki

[15] https://www.ers.usda.gov/data-products/international-macroeconomic-data-set.aspx

[16] The impact of COVID-19 on the country's economy and society: Results of 2020 and Challenges and Threats to Post-Pandemic Development Department of Strategic Planning and Macroeconomic Forecasting April 2021 Consensus Forecast No. 53 file:///C:/Users/Admin/Downloads/Concensus_Forecast_%2353_2021_ukr%20 (7).pdf

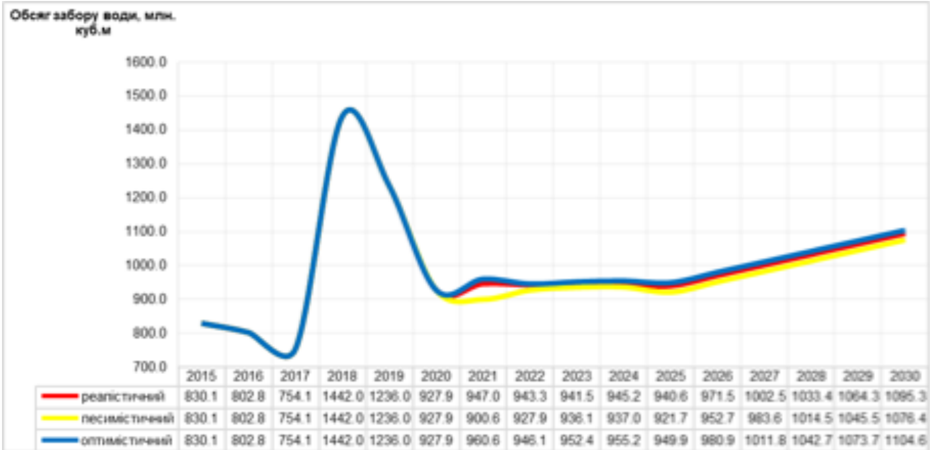


Figure 30. Forecast of water withdrawals in the Azov River basin up to 2030

Water use is expected to decline in 2020 due to the COVID-19 pandemic. Since 2021, there has been a stable trend of gradual growth in water intake.

The forecast of water withdrawal in the Pryazovia River basin by 2030 by economic sectors was made on the basis of the analysis of water use data series and their modelling in retrospect based on forecast values. The results are presented in Fig. 31.

In 2020, the volume of water withdrawals for housing and communal services is expected to decrease as a result of quarantine restrictions and the introduction of hygiene and sanitary protocols in connection with the spread of the COVID-19 pandemic. Population growth is not expected. Due to the intensification of economic processes, water intake is expected to increase in 2021. The trend of consistent growth is expected from 2025. Fluctuations in the range of 0.1 - 3.8%.

Water resources for the industrial sector are of significant importance according to the socio-economic importance assessment. A significant decline in water intake is forecast due to significant losses caused by the COVID-19 pandemic. It will take 2-3 years to restore the lost potential during the pandemic. The situation is expected to stabilise and the industrial sector is expected to gradually increase its water withdrawal by 2030.

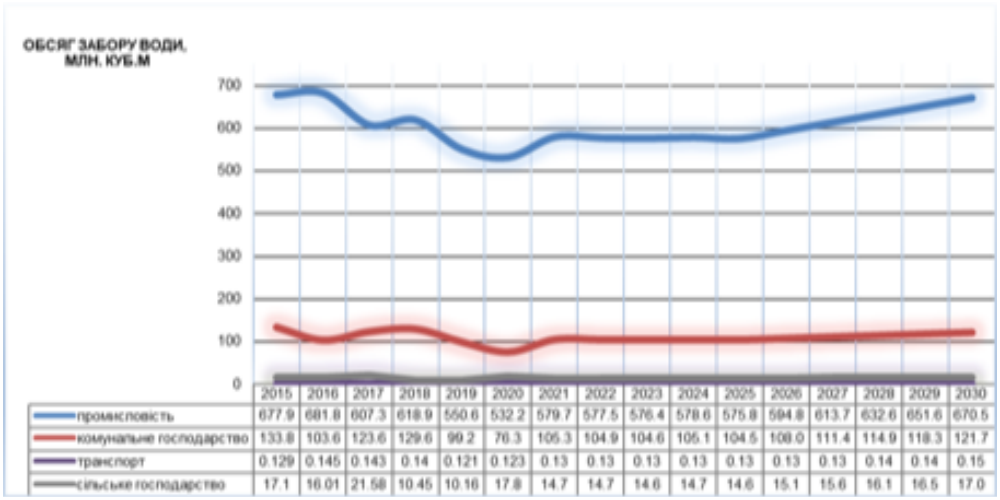


Figure 31. Forecast of water withdrawals in the Azov River basin by 2030 by economic sector

There is a high probability of further waves of the COVID-19 pandemic in 2021-2022. However, their impact on society and the economy will be smaller than that of the first wave, given the processes of adaptation of the economy and society to the current reality. Confidence in the growing role of digitalisation in society is growing, which will affect the development of certain sectors of the economy (including IT) and the labour market.

In terms of industries, in 2021, there will be an increase in mining and quarrying, production of chemicals and chemical products, and metallurgy. At the same time, production will decline in machine building, food and light industries.[17]

[17] https://ekonom.dn.gov.ua/ekonomika/socialnij-ta-ekonomichnij-rozvitok-regionu/korotki-pidsumki, https://www.zoda.gov.ua/news/57749/stan-sotsialno-ekonomichnogo-rozvitku-zaporizkoji-oblasti-na-19.10.2021.html, https://khoda.gov.ua/pokazniki-ekonomichnogo-rozvitku

Agriculture in the Pryazovia River basin in terms of water intake is expected to grow gradually and evenly until 2030, mainly due to the development of irrigation.

No significant increase in water withdrawals by transport sector water users is forecast.

6.4. Tools of economic control

6.4.1 Payback of water resources use

The use of water resources in Ukraine (general and special) is regulated by the Water Code of Ukraine, the Law of Ukraine "On Environmental Protection" and other legislative acts developed pursuant to these laws and approved by joint orders of the ministries and departments concerned.

I. CENTRALISED WATER SUPPLY AND SEWERAGE SERVICES

The principles of "user pays" and "polluter pays" are implemented in Ukraine primarily through the payment of utility bills for water supply and sewerage by individuals, households and legal entities. According to the Law of Ukraine "On Drinking Water, Drinking Water Supply and Sewerage"[18] , "drinking water supply has priority over other types of special water use". Consumption of quality drinking water is the most important factor in the life support of every citizen of the country. In Ukraine, the National Energy and Utilities Regulatory Commission (NEURC) and local governments establish the following tariffed water services:

- for centralised water supply and sewerage (cold water), and sewerage (cold and hot water);
- for centralised supply (cold water) and sewage (cold and hot water) using in-building systems;

Services are provided to the following customers in accordance with the law:

- consumers who are business entities in the water supply and sewerage sector;
- Consumers who are not business entities in the field of centralised water supply and sewerage (budgetary organisations, households, other consumers).

In the Azov river basin, centralised water supply and sewerage services are provided by 5 licensees of the National Energy and Utilities Regulatory Commission and more than 180 organisations licensed by local authorities.

The most significant revenues are received by water and sewerage companies. According to estimates, water and sewerage companies of the NEURC licensees in the Azov River Basin (5 licensees, 10% of the national market[19]) received about UAH 1800 million[20] (including VAT) in 2020, or 17% more than in the previous year, and UAH 1500 million (including VAT) in 2019.

According to the calculations of licensees of local governments in the Azov River basin, the following was received: UAH 54.3 million (including VAT) in 2020 and UAH 44.0 million (including VAT) in 2019, respectively.

In total, in 2020, consumers in Ukraine received water consumption services (centralised water supply and sewerage with and without in-building systems) from business entities in the supply and sewerage sector - NEURC licensees - for a total amount of UAH 18.4 billion (excluding VAT), or UAH 22.1 billion including VAT[21] or 17% more than in 2019 - UAH 15.8 billion (excluding VAT), or UAH 18.9 billion including VAT).[22]

According to the State Statistics Service, in 2020, the volume of water consumption services sold in Ukraine totalled UAH 24.4 billion (excluding VAT).

Despite the significant revenues, the financial position of water and sewerage companies remains unsatisfactory. The reasons for this are primarily the insufficient level of customer payments for services provided, which amounted to 94% in 2020, with the largest debts owed to two companies in the Azov River basin: ME Mariupol VUVKG - UAH 116.6 million, ME Water of Donbas Company - UAH 1,217.7 million. This, in turn, worsens the solvency of enterprises and creates debts for electricity and wages[23] . The worst situation with electricity payments was experienced by licensees located in the Azov Sea basin, whose debt crossed the UAH 1 billion mark in previous years: KP "Water of Donbas" - UAH 4301.2 million, KP "Oblavvodokanal" of the Zor region - UAH 5.503 million. It remains important to introduce control and transparent mechanisms for the economic activities of

[18] The Law as amended on 01.05.2019.
[19] As of the beginning of 2020, the NEURC licensed 51 water and wastewater companies.
[20] Hereinafter, calculations were made on the basis of available statistics in Ukraine.
[21] Report on the results of the activities of the National Energy and Utilities Regulatory Commission in 2020. - Kyiv, 2020 - P. 184.
[22] Report on the results of the activities of the National Energy and Utilities Regulatory Commission in 2019. - Kyiv, 2019 - P. 158.
[23] The results of monitoring the activities of NEURC licensees in the field of centralised water supply and centralised wastewater disposal in 2020.

water utilities by state regulatory authorities.

The state of water supply and sewerage networks in the Pryazovia River basin is extremely unsatisfactory. More than half of the water supply and sewerage networks are in an emergency and worn-out condition, and only 2% of the identified needs are repaired annually (Fig. 35. The cost of restoring the networks is so high that it is impossible to do so through depreciation alone - the duration of restoration would exceed hundreds of years.

The total length of the water supply networks of the NEURC licensees in Ukraine is 55.3 thousand km, of which 47% are dilapidated and in disrepair. The funds of enterprises that can be used for rehabilitation purposes (annual depreciation) amount to about UAH 473 million, but the cost of rehabilitation is 475 times higher[24] .

It should be noted that the approval of planned tariffs for water utilities for the next calendar year is carried out by the NEURC and local authorities if the company has investment programmes, which is a significant step towards modernising water and sewerage networks.

The main source of investment in 2019, as in previous years, was depreciation in the amounts provided for in the tariff structures (58% of total investment). Funds were also raised from the profit provided for in the tariff structure of licensees.

The payback period for centralised water supply and sewerage services, based on the calculation of the cost of the service and the established tariff for the service, is more than 100%.

Given that the profit in the tariffs was on average set at 2%, in the Azov River basin, according to calculations, the profit of the utilities of the NEURC licensees (5 licensees, 10% of the national market) was about UAH 17.6 million (in total, the companies received about UAH 1800.0 million). However, none of the companies planned to use the profit to form a reserve fund (capital) for modernisation, which should have been provided for in their business activities.

According to the NEURC, "the amount of production investments from profits is determined in the amounts necessary for the gradual restoration of networks (improvement of the functioning of water and sewerage enterprises), and taking into account the needs to fulfil the financial obligations of licensees to international financial organisations". However, this level is extremely insufficient. Thus, the level of investment from all sources under 49 investment programmes approved by NEURC in 2020 amounted to UAH 3,0627.45 million (an average of 71 million per enterprise), of which 26.5% was due to depreciation (as provided for in the tariff), 15.8% - to production investments from profits, 3.8% - unused funds of other periods, and 0.2% - funds from other sources.

II. SPECIAL WATER USE AND REVENUES FOR IT

According to the Water Code of Ukraine (Article 48), special water use is carried out by legal entities and individuals to meet the drinking needs of the population, as well as for household, medical, recreational, agricultural, industrial, transport, energy, fisheries (including aquaculture) and other state and public needs. According to Article 50 of the Water Code, special water use may be short-term (for three years) or long-term (from three to twenty-five years).

In accordance with the principles of "user pays" and "polluter pays" The Tax Code of Ukraine establishes a fee for special water use:

1. rent for water intake for different types of water users;
2. environmental tax on discharges into water bodies.

In addition, there is a fee for the use of water bodies for aquaculture purposes:

3. rent for water bodies,
4. payment for the special use of aquatic bioresources.

1) Rent for special water use

Rent for special water use is paid:

1. business entities that have their own water intake facilities and relevant equipment for water intake (the so-called primary water users, Article 42 of the Water Code of Ukraine), which use and/or transfer water obtained by water intake from water bodies to secondary users;
2. business entities that use water for hydropower, water transport and fish farming.

In Ukraine, 10% of the rent payment for special water use is credited to the State Water Development Fund[25] , the

[24] The NEURC's report for 2020.
[25] Budget Code of Ukraine, Article 24⁻ . State Fund for Water Management Development.

remaining 45% is directed to the general fund of the state budget[26] for other purposes and 45% remains in local budgets. The State Fund for Water Development has been operating in Ukraine since 2018 and is the first state financial instrument to address water issues through which the principle of "water pays for water" is implemented. It is replenished with funds directly received by the budget from the use of water resources. The average annual volume of this fund is about UAH 140 million.

The largest payers of rent for special water use in the Azov basin are. Pryazovia River basin for the average annual water intake are PJSC Azovstal Iron and Steel Works - 490.5 million m^3, PJSC Mariupol Ilyich Iron and Steel Works - 51.34 million m^3, Mariupol Regional Water Management Department of the Water of Donbass Company - 30.58 million m^3, and Municipal Enterprise Vodokanal of Melitopol City Council - 6.506 million m^3.

The state and local budgets received a total of UAH 223.4 million from business entities in the Azov Sea basin by administrative region in 2017, UAH 247.1 million in 2018, UAH 222.3 million in 2019, and UAH 190.3 million in 2020 - Fig. 36 and Table 40.

Table 40. Dynamics of rent revenues for special water use in the Azov Sea basin, thousand UAH[27]

Oblast	2017		2018		2019		2020	
	state budget	local budget	state budget	local budget	state budget	local budget	state budget	local budget
Donetsk*.	34513,93	34518,14	31109,38	25458,22	27627,33	22607,08	27153,06	22220,22
Zaporizhzhya*.	70831,44	70875,57	94471,73	77320,19	88292,46	72271,23	71305,17	58347,16
Kherson*.	6349,07	6350,85	10333,93	8467,11	6338,27	5198,82	6211,99	5085,9
Total for individual budgets*.	111694,40	111744,56	135915,04	111245,52	122258,06	100077,13	104670,22	85653,28
Total for the basin	223438,96		247160,56		222335,19		190323,5	

In general, the dynamics of rent revenues to the budgets of the regions of the Azov Sea basin is downward. The highest revenues over the last three years were in 2018: Zaporizhzhia region - UAH 171,791.92 thousand, Donetsk region - UAH 56,567.6 thousand, Kherson region - UAH 18,801.04 thousand.

In total, the state and local budgets of Ukraine received UAH 190,323.5 thousand from rent for special water use in 2020, which is UAH 32,011.69 thousand less than in 2019.

Specifically, the state budget of Ukraine received UAH 104670.22 thousand in 2020, which is 86% of the 2019 figure of UAH 122,258.06 thousand. In 2020, local budgets of all levels received rent for special water use in the amount of UAH 85653.28 thousand, of which:

- UAH 71329.2 thousand, or 83% of the rent for special water use (except for the rent for special use of water of local water bodies) and UAH 8.2 thousand of the rent for special use of water of local water bodies;
- UAH 7231.1 thousand, or 8% of the rent for the use of water for hydropower,
- UAH 6,808.9 thousand, or 8% of the rent for water use from housing and communal services,
- UAH 265.9 thousand or 0.3% of the rent for special water use in terms of surface water use for water transport (except for parking and service and auxiliary fleets).

An analysis of revenues from rents for special water use in the Azov river basin indicates that about 7-8% of all revenues in Ukraine are generated in this river basin.

The dynamics of rent revenues to the budgets of the Pryazovia River basin regions in the last three years of 2018-2020 has been declining, with only Zaporizhzhia region improving its performance, while in Donetsk and Kherson regions the dynamics of water rent revenues is declining.

2) Environmental tax on discharges of pollutants into water bodies

One of the most important economic instruments through which the "polluter pays" principle is implemented is the environmental tax in accordance with the Tax Code of Ukraine. Water users are obliged, among other things, to comply with the established standards of maximum permissible discharge of pollutants and limits of discharge of pollutants; to monitor the quality and quantity of waste water and pollutants discharged into water bodies and the water quality of water bodies in control structures (which the state does not actually control in good faith, not taking into account scheduled inspections by the State Environmental Inspectorate); to carry out special water use

[26] Budget Code of Ukraine, Article 29, paragraph 4.
[27] Note:* - The indicator is adjusted in accordance with the share of the oblast territory in the Azov River basin.

only if there is a permit for special water use. The limit of pollutant discharge is specified in the permit for special water use, which is issued in accordance with the Procedure for Issuing Permits for Special Water Use, approved by the Cabinet of Ministers of Ukraine on 13.03.2002 No. 321 (Procedure No. 321). However, according to the Accounting Chamber[28], the number of taxpayers submitting tax reports on environmental tax to the State Tax Service in Ukraine may be less than the number of business entities that have special water use permits with established limits of discharges into water bodies from the State Agency of Ukraine for Water Resources.

According to the allocation of funds set out in the Budget Code of Ukraine, 45% of the environmental tax on discharges of pollutants into water bodies goes to the general fund of the state budget[29], 55% to the special fund of local budgets, including:

1. to village, settlement, city budgets, budgets of amalgamated territorial communities established in accordance with the law and the perspective plan for the formation of community territories - 25%;
2. regional budgets - 30%.

In 2020, the special fund of local budgets received UAH 6685.1 million in tax revenues for discharges of pollutants directly into water bodies in the basin.

The general fund of the state budget received UAH 8,638.6 million (45% of the budget allocation) from the regions of the Azov Sea basin. In 2020, the total consolidated budget of the Azov River basin regions was UAH 190.3 million.

In general, in 2017, the consolidated budget (state and local) of Ukraine received UAH 144.8 million in tax revenues for pollutant discharges directly into water bodies, in 2018 - UAH 159.1 million, in 2019 - UAH 155.7 million, and in 2020 - UAH 148.1 million (which is about 0.01% of all tax revenues in Ukraine).

In addition to low rates of environmental tax, there is also the problem of unfair payment of this tax by enterprises. In addition, there are differences between the data submitted by environmental taxpayers for pollutant discharges and the data from state water use accounting by type and volume of pollutants.

This indicates a weak level of control over water pollutants by state and territorial governments.

3) Payment for the lease of water bodies

Payment for leased water bodies is made in accordance with the Methodology for determining the amount of payment for leased water bodies[30] . The calculation of the rent for a fishery technological reservoir is carried out in accordance with another Methodology[31] .

The fee for the lease of water bodies goes to local budgets of all levels (regional, district, and basic local budgets).

The weighted average rent is unified for all water bodies in the RBD. Azov region and is constantly increasing. Its dynamics is as follows: in 2014 - 100 UAH/ha, 2015 - 114.9, 2016 - 153.2, 2017 - 156.9, 2018 - 162.7 UAH/ha, 2019 - 162.7 UAH/ha.

According to estimates, the budgets in the regions of the Azov Sea basin received UAH 1.01 million in 2017, UAH 1. 07 million in 2018, UAH 1.09 million in 2019, and UAH 1.0 million in 2020 in rent for water bodies – Table 41.

According to the State Tax Service, in total, local budgets of all levels in Ukraine received UAH 10-10.4 million for the lease of water bodies in 2017-2018 and UAH 13.5-13.9 million in 2019-2020.

Table 41. Revenues from rent for water bodies in the basin, thousand UAH

Oblast	2017	2018	2019	2020
Donetsk	352,285	407,636	433,424	443,372
Zaporizhzhya	570,431	537,361	476,528	359,041
Kherson	87,672	129,815	175,488	196,913
Total for the basin	**1010,388**	**1074,812**	**1085,440**	**999,326**

4) Payment for the use of aquatic bioresources

[28] Report on the results of the audit of the effectiveness of the exercise of powers by public authorities in terms of control over the completeness and timeliness of the receipt of environmental tax on emissions into the atmosphere and discharges into water bodies. 2018: URL: https://rp.gov.ua/up load-files/Activity/Collegium/2018/10-3_2018/Zvit_10- 3_2018.pdf

[29] Budget Code of Ukraine, Article 29, paragraph 16.

[30] Methodology for determining the amount of payment for leased water bodies. approved by Order of the Ministry of Ecology and Natural Resources of Ukraine No. 236 of 2013.

[31] Methodology for Determining the Amount of Payment for the Use of a Part of a Fishery Water Body, Fishery Technological Reservoir on a Leasehold Basis, approved by the Ministry of Agrarian Policy and Food of Ukraine on 14 January 2014, No. 11.

The fee for the use of aquatic bioresources is levied in accordance with the Resolution of the Cabinet of Ministers of Ukraine.[32] According to the report on local budgets, by budget code, the fee for the special use of aquatic bioresources in 2020 amounted to UAH 366 thousand in Donetsk region, UAH 531 thousand in Kherson region, UAH 271 thousand in Zaporizhzhia region, for a total of UAH 1,168 thousand. The total amount raised in Ukraine was UAH 10.4 million. - Table 42. In the Pryazovia River basin, the amount of payment for the use of aquatic bioresources was 11.2% of the total.

Table 42. Fees for the use of aquatic bioresources

Oblast	2017	2018	2019	2020
Donetsk	169 758	195 777	145 230	366 162
Zaporizhzhya	518 116	382 477	183 427	271 186
Kherson	318 198	376 558	372 909	530 578
Total for the basin	**1 006 072**	**954 812**	**701 566**	**1 167 926**

Despite a 62% increase in rents over the past 5 years, the level of rents remains quite low. The rent for water bodies in the Azov Sea basin goes to local budgets of all levels, and in total it accounts for 10% of all funds collected in the country. It is one of the largest: in 2020, it amounted to UAH 443 thousand in Donetsk region, UAH 359 thousand in Zaporizhzhia region, and UAH 196 thousand in Kherson region. In total, the Pryazovia River basin receives about UAH 1 million in local budgets.

A special fee for the use of aquatic bioresources is paid to local budgets, but its amount is not very significant.

ANALYSIS OF THE INVESTMENT SECURITY OF THE AZOV RBD

The analysis of investment support for the reproduction of the water management complex in the Azov River basin allows to calculate the payback of water services. It considers:

1) capital investments by type of environmental protection activity (wastewater treatment, soil, groundwater and surface water protection and rehabilitation) from budgets of all levels and from enterprises,
2) state budget expenditures on water sector operation (irrigation infrastructure),
3) borrowed funds and technical assistance from international financial organisations. Forecasting the required investments is one of the next steps in modernising the water sector and identifying and ranking the necessary measures.

The sectoral peculiarities of investment support in the water use sector are due to the fact that investment activities of both the state and business entities are mainly focused on the current maintenance and repair of hydraulic and treatment facilities. In the industrial water use sector, large water users - industrial enterprises - are slow to implement water recycling systems and modernise wastewater treatment facilities due to limited domestic and inability to attract external investments, as well as the lack of appropriate incentives that would encourage businesses to implement low-water and waterless technologies. In the water sector, investment priorities include the construction of new and reconstruction of existing flood control and flood protection facilities, updating the material and technical base for monitoring the state of water resource potential, and developing the infrastructure of the basin management system.

1. Capital and current expenditures from the state and local budgets for environmental programmes in the field of water resources protection

Investment in the water sector in Ukraine is limited by the dominance of state ownership of water and water management assets and the small share of investment in tariffs for water supply and sewerage services. The state and local budgets are important sources of investment in the water sector.

Several state and regional investment programmes were implemented in the Azov River basin in 2015-2020. Their peculiarity is the constant underfunding based on the "residual principle".

A) National programmes

The State Target Programme for the Restoration and Development of Peace in the Eastern Regions of Ukraine was approved by the CMU Resolution of 13 December 2017 No. 1071, which is used to restore critical infrastructure of water supply and sewage systems (100 facilities and 425 km of water supply and sewage networks); the National Target Programme "Drinking Water of Ukraine" for 2011-2020, which was suspended each year by the Laws on Budget for the following year. Some measures were financed under regional programmes;

B) Regional programmes

[32] Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Procedure for Charging Fees for the Special Use of Aquatic Bioresources and the Amount of Fees for Their Use" of 12 February 2020, No. 125.

Donetsk Oblast. The Regional Programme for Flood Protection of Cities and Towns of Donetsk Oblast for 2015-2020 within the Pryazovia River includes 12 measures for which funding in the amount of UAH 69.5814 million is provided, including UAH 67.9814 million from the regional environmental protection fund and UAH 1.6 million from the local budget. In fact, 3 measures in the amount of UAH 44.95733 million were implemented at the expense of the regional environmental protection fund, namely:

- "Protection of Yalta village, Pershotravnevyi district, Donetsk region, from flooding. Clearing the channel of the Mokra Bilosaraika River. Arrangement of the dyke bund. Construction stage 1. Clearing the riverbed" in the amount of UAH 0.90536 million;
- "Drainage system from Nakhimov Avenue along Klenova Balka in the Primorsky district of Mariupol. II launch complex. Stage 3. Central spur (construction)" in the amount of UAH 28.05197 million;
- "Drainage system from Nakhimov Avenue along Klenova Balka in the Primorsky district of Mariupol. II launch complex. Stage 3. Central spur. Extension to Metallurgov Avenue (design and construction)" in the amount of UAH 16.0 million.[33]

Zaporizhzhia region. The Regional Programme for the Development of Water Management and Environmental Rehabilitation in the Pryazovia River Basin of Zaporizhzhia Oblast for 2016-2020 includes 3 areas, namely:

- Ensuring the development of land reclamation and improvement of the environmental condition of irrigated and drained land in the amount of UAH 481.1592 million;
- Priority provision of centralised water supply to rural settlements that use imported water in the amount of UAH 163.7534 million;
- Protection of rural settlements and agricultural land from the harmful effects of water in the amount of UAH 73.4011 million.
- A total of UAH 718.3137 million is planned for the implementation of the programme from the following funding sources: local budget - UAH 30.8132 million, state budget - UAH 658.3367 million, and other sources - UAH 29.1638 million. In fact, during 2016-2020, only one measure under the first direction was funded by 65% in the amount of UAH 313.0491 million, of which: UAH 310.6022 million from the state budget and UAH 2.4469 million from other sources.

Kherson region. The Regional Programme for the Development of Water Management and Environmental Rehabilitation in the Pryazovia Basin of Kherson Oblast for 2016-2020 includes measures to be implemented at the expense of budgets of different levels. The following funds were allocated from local budgets to implement measures to protect rural settlements and agricultural land in the Azov Sea basin within Kherson Oblast from the harmful effects of water pollution In 2016 - UAH 0.082 million, in 2017 - UAH 0.109 million, in 2018 - UAH 0.181 million, in 2019 - UAH 0.007 million, in 2020 - UAH 0.031 million. In addition, in 2019, UAH 1.586 million was allocated from the local budget of Genichesk for the reconstruction of sewage treatment facilities in Genichesk and UAH 0.1134 million was allocated from the environmental protection fund of local governments in 2020 for waste disposal, cleaning up illegal landfills in the settlements of Genichesk district and landscaping.[34]

According to government statistics, capital investments and current expenditures are allocated to nine environmental areas, which are classified as such:

- air protection and climate change issues;
- waste water treatment and waste management;
- protection and rehabilitation of groundwater and surface water;
- conservation of biodiversity and habitats;
- Reduced noise and vibration impact;
- radiation safety; environmental research and development;
- waste management;
- other areas of environmental protection.

Among them, two areas are directly related to the reproduction and protection of water resources, namely:

1) wastewater treatment and 2) soil, groundwater and surface water protection and rehabilitation. The share of the first area is more significant than the second; together they account for one third of all expenditures from the total amount of capital and current expenditures in all areas.

[33] Compiled on the basis of the letter of the Siverskoye Donets'ke BVR dated 31.05.2021 No. 09/1967.

[34] Compiled based on the letter of the Lower Dnipro BURA dated 01.06.2021 No. 08/286/3/538.

It should be noted that actual investment volumes are growing from year to year, but the share of capital expenditures in total expenditures (capital and current expenditures combined) is unsatisfactory, so in 2020, the share of the first direction in the Azov River Basin is more significant than the second, and together they account for more than a third of all expenditures from the total amount of capital and current expenditures in all directions. The dynamics of capital expenditures is shown in Table 43.

Table 43. Dynamics of capital expenditures on water resources restoration and protection in the Azov River basin in 2017-2020, UAH thousand[35]

Oblast		2017			2018			2019			2020		
		Total expenditure on environmental programmes, including:	Waste water treatment	protection and rehabilitation of soil, underground and surface water	Total expenditure on environmental programmes, including:	Waste water treatment	protection and rehabilitation of soil, underground and surface water	Total expenditure on environmental programmes, including:	Waste water treatment	protection and rehabilitation of soil, underground and surface water	Total expenditure on environmental programmes, including:	Waste water treatment	protection and rehabilitation of soil, underground and surface water
Donetsk*.	investment	319925,9	38176	11013	625379,5	43057	6529	1069292,5	43057	6529	1279986,5	71013	10133
Zaporizhzhya*.	investment	400386,2	38892	107378	522018,3	64788	70733	530930,1	64788	70733	442443,3	42802	93019
Kherson*.	investment	930,7	584	35	4435,8	1353	253	2133,7	1353	253	3200,2	1940	46
Together in the pool	investment	721242,8	77652	118426	1151833,6	109198	77515	1602356,3	109198	77515	1725620	115755	103198
% of programmes from the total			10,8 %	16,4 %		9,5 %	6,7 %		6,8 %	4,8 %		6,7 %	6,0 %
A total of 2 water protection programmes			196078			186713			186713			219510	

[35] Note * - Indicators are adjusted according to the share of the region's territory in the basin

2. State budget expenditures for the State Agency of Water Resources for water infrastructure

One of the main problems on the way to establishing highly productive agricultural production in the Pryazovia River basin is the unsatisfactory technical condition of reclamation systems caused by insufficient funding for their reconstruction and modernisation. The following measures will help to increase the efficiency of irrigated land use: development and reconstruction of irrigation systems; flood control measures; restoration of domestic sprinkler equipment production; monitoring the hydrogeological situation of irrigated land, minimising irrigation rates and optimising the regional structure of irrigated areas; and introducing water conservation technologies.

The dynamics of expenditures in the Azov River basin for the operation of the state water management complex and water resources management is positive, totalling UAH 154.1 million in 2020. Over the past six years, funding has increased by 2.3 times. Two more sources of funding have been added in recent years: The State Fund for Water Development (3-4%) and a subvention from the state budget to local budgets - Table 44.

Table 44. Dynamics of expenditures in the Azov River basin for the operation of the state water management complex, thousand UAH

Year	General fund	Development Fund water farms	Subvention	Together
2015	66118,8			66118,8
2016	68354,7			68354,7
2017	98392,2		198,0	98590,2
2018	114109,9	864,8		114974,7
2019	147348,4	1806,6		149155,0
2020	154108,2			154108,2

Based on the economic efficiency of growing crops on irrigated land, the cost of irrigation services can reach UAH 6 per 1 m^3 of water[36] (as of early 2019).

The growing dynamics of expenditures on the maintenance of the state water management complex allows the Azov River basin to increase expenditures on the maintenance of irrigation infrastructure.

If irrigation tariffs included a profit margin (which would objectively lead to an increase in the cost of water), it would be possible to allocate part of the profit (up to 50%) to modernise and expand irrigation areas.

3. Raising funds from international financial institutions

Another source of investment is external loans and non-repayable international technical assistance from international financial organisations, including through regional infrastructure programmes.

According to the Ministry of Finance of Ukraine, as of the beginning of 2020, a large-scale IBRD project "Urban Infrastructure Development"[37] is under implementation, with the period of implementation being 2014-2020.

The aim of this project is to improve the quality and reliability of utility services and their energy efficiency for about 6 million residents of Ukraine in 11 cities by restoring and replacing damaged water supply and sewage systems, improving the environmental situation by addressing the problem of wastewater treatment, improving institutional capacity, etc. The total amount of sub-loan agreements of the NEURC licensees under the project is USD 276.9 million. THE TOTAL AMOUNT OF SUB-LOAN AGREEMENTS OF THE NERC LICENSEES UNDER THE PROJECT IS USD 276.9 MILLION.

PAYBACK OF WATER RESOURCES USE IN THE AZOV REGION

If the payback ratio of water use, calculated by the formula

"Income / Expenses * 100" is greater than 100%:

- This means that all costs are reimbursed through the payment of tax and non-tax revenues for services to budgets of all levels or through tariffs; budget revenues, if used for their intended purpose, can be used for the restoration of water resources; enterprises receive profits that can be used for production development - production investments, formation of a reserve fund (capital), etc. (part of which will be used to pay income tax);
- if the indicator is less than 100%, this indicates a threat to the sustainability of the service, as the costs of budgets or enterprises are not covered by the revenues received.

[36] Draft Strategy for Irrigation and Drainage in Ukraine until 2030.
[37] Information on social and economic development projects in Ukraine supported by international financial organisations that are currently being prepared and implemented.
URL: https://mof.gov.ua/uk/reestr-spilnih-z-mfo-proektiv-shho-znahodjatsja-na-stadii-pidgotovki-ta-realizacii-informacija.

The payback period for water use in the Azov Sea basin was calculated using the formula and is 14%, which means that costs are higher than fiscal payments (Table 45).

Table 45. Balance of revenues and capital expenditures in 2020 in the Azov River Basin

SOURCES	The amount of income in the basin, thousand UAH	EXPENSES	The amount of expenditure in basin, thousand UAH
Rent for special water use (state and local budgets)	190 323,6	Capital expenditures on water resources development and protection	1 278 672
Environmental tax on discharges into water bodies (state and local budgets)	10 478,7	Expenditures from the state budget for the operation of the state water management complex	154 108,2
Rent for water bodies (parts thereof) provided for use on a lease basis (local budgets)	999,3	Subsidies from the state budget for water supply and sewerage services	
Payment for special use of bioresources (local budgets)	1 167,9		
TOGETHER	**202 969,5**	**TOTAL EXPENSES (without subsidies)**	**1 432 780,2**
Payback (income/expenditure*100%)	**14%**		

With a coverage rate of 14% in 2020, a critical situation is evident when capital investments in water resources restoration and protection are no longer covered by fiscal payments from enterprises (rent + environmental tax + rent + payment for biological resources).

Among the reasons for this situation is, in particular, the non-payment of rent by some business entities. However, the main reason is the lack of financial instruments that would balance state budget expenditures and fiscal revenues in the planning process at the legislative level.

6.4.2. Water tariffs

Tariffs for centralised water supply and sewerage

In accordance with the institutional structure described in section 1.4.1 (Figure 11), the following types of tariffs are set by the NEURC and local governments for centralised water supply and sewerage services in Ukraine:

- Tariff for centralised supply (cold water, hot water separately) and sewerage (cold and hot water together);
- The tariff for centralised supply (cold water, hot water separately) and sewerage (cold and hot water) using in-building systems;

As of the beginning of 2020, tariffs for centralised water supply and wastewater disposal were set for five companies in the Azov River Basin.

As of 01.01.2020, there were 51 such licensees in Ukraine, providing services to 76% of consumers in the country. The remaining 24% of consumers are provided with services by about 3,000 enterprises throughout Ukraine that are business entities in the field of water supply and sewerage and are licensees of local governments[38] .

In the Azov Sea basin, only 2 licensees have established tariffs for water supply and sewerage for consumers who are water supply and sewerage entities, namely the enterprise ME "Company "Water of Donbas" and ME "Oblavvodokanal" of the Zor, from which other water utilities buy water, the costs of which are included in the tariffs of these enterprises.

The level of reimbursement of centralised water supply and sewerage costs for consumers who are not business entities in the field of water and wastewater treatment (tariff to cost) for all water utilities - licensees of the NEURC in the Azov River Basin is above 100%.

The weighted average cost of centralised water supply and sewerage services increased by 20% and 11%, respectively, in 2020. The main items in the cost structure are labour costs (including social security and benefits)

[38] Report on the results of the activities of the National Energy and Utilities Regulatory Commission in 2020, htpp://www.nerc.gov.ua/data/filearch/Catalog3/Richnyi_zvit_NKREKP_2020.pdf

and electricity. Their shares are 38% and 28% in water supply and 51% and 25% in wastewater treatment, respectively.

Less significant cost components are depreciation, repair costs, reagents and fuels and lubricants, as well as taxes and fees, including a fee for special use of water (rent) and subsoil use fees for fresh groundwater extraction. The weighted average tariff structure includes 0.5% of these taxes.

The profit as part of the weighted average tariff in 2020 was UAH 0.16/m^3 or 2%.

In addition to the NEURC licensees, another 175 utilities provide water supply and sewerage services in the Azov Sea basin, with tariffs separated for households, budgetary organisations and other categories of consumers.

The discrepancy between these tariffs is very significant - for example, the tariff set by the Vodokanal of the Veselivske village council for the population is UAH 28.0 for water supply, while for budgetary and other organisations it is almost 2 times higher and amounts to UAH 42.01 per m^3 of water[39] .

In the structure of the weighted average tariff calculated for the 5 NEURC licensees, the average share of water purchases from other water utilities is 41.7%.

So, if we look at the cost of water as a resource, it is firstly included in the tariffs of water utilities. After all, the tariff structure includes the cost of mandatory fiscal payments, which include rent for special water use, which is about 0.5-1%. However, for some water utilities in the Azov Sea basin, the tariff structure includes, in addition to these tax payments, the purchase of water from another entity.

The cost of water for industrial enterprises

It should be noted that the cost of water is actually paid by industrial enterprises in the form of a mandatory payment for special water use - a rent, the amount of which depends on the type of water consumed, the purpose, place and region of consumption, and the actual volume of water used.

This cost is not paid if the volume of consumption is less than 5 m^3 per day and the water user does not have its own water intake facilities.

The rates of rent for special use of water are set by the Tax Code of Ukraine and are differentiated by region and basin. In the Pryazovia River basin, the rates are shown in Table 51. It should be noted that the rates for the use of water in the Azov River are the highest in Ukraine - UAH 159.91 per 100 m^3 , for example, the rates for the use of water in the Dnipro River are UAH 75.33 per 100 m^3 .

The rates allocated for the use of groundwater in the Azov river basin are as follows: in Donetsk region, the highest rates are 126.59 UAH per 100 m^3, in Zaporizhzhia region - 106.46 UAH per 100 m^3, in Kherson region - 99.86 UAH per 100 m^3. Separate rent rates are set for special use of water for hydropower, water transport, fish farming, etc.

For thermal power plants with a direct-flow water supply system, the rent for the actual volume of water passed through the turbine condensers for condensate cooling is calculated using a coefficient of 0.005. Housing and communal services companies apply a coefficient of 0.3 to the rental rates. In the structure of the heat tariff, the cost of water rent generally does not exceed 1%.

The rent is not paid if:

- water is only purchased from primary water users and is not produced independently;
- is used only to meet the drinking and sanitary needs of the population, including to meet exclusively their own drinking and sanitary needs (toilets, showers, bathrooms and washbasins, maintaining the sanitary and hygienic condition of the premises);
- for firefighting purposes; for external improvement of cities (e.g. fountains); in other cases, in accordance with clause 255.4 of the TCU and Article 48 of the CCU.
- water intake is carried out, but within the limits of up to 5 m^3 per day. This is not considered special water use (Article 48 of the Water Code of Ukraine). However, *if water is used as an ingredient in beverages and packaged drinking water, then rent must be paid regardless of the volume of extraction.* Therefore, beverage companies pay rent for special water use as the cost of water.

The cost of polluting water bodies is paid in the form of fines and environmental tax for discharges of pollutants into water bodies. The environmental tax is increasing from year to year. In accordance with the Tax Code of Ukraine, the tax rates for discharges of pollutants into water bodies are as follows (Table 46).

[39] Information on the current tariffs for water supply and sewerage services provided by the region's utility companies as of 31.12.2020.

Table 46. Environmental tax rates for discharges of certain pollutants into water bodies[40]

Name of the pollutant	Tax rate, UAH per 1 tonne
Ammonium nitrogen	12883,84
Organic matter (based on biochemical oxygen demand (BOD 5)	5156,8
Suspended solids	369,52
Petroleum products	75792,4
Nitrates	1108,56
Nitrites	63278,16
Sulphates	369,52
Phosphates	10297,44
Chlorides	369,52

The main requirements for regulating the maximum permissible discharge (MPD) of pollutants generated in the course of production activities of water users are determined by the Procedure for the development and approval of the maximum permissible discharge standards for pollutants[41].

According to paragraph 3 of this Procedure, the MPC standards for pollutants are set with the aim of gradually achieving the environmental water quality standard for water bodies. In accordance with paragraph 8 of the Procedure, the lists of pollutants whose discharge is regulated are reviewed and supplemented by the Ministry of Ecology and approved by the CMU (once every three years). The State Audit found that the lists of pollutants of the Ministry of Ecology and Natural Resources have not been reviewed and supplemented for more than 21 years.

Cost of water intake services for irrigation

The state-owned operators of the *irrigation* water supply market are water management organisations of the State Agency of Water Resources.

The cost of such services is formed on the basis of a unified approach, which is defined by the Order of the SAWR[42] and is determined on the basis of economically justified costs directly related to their provision. The costs include: direct labour costs, direct material costs and other direct costs, general and administrative expenses, including the cost of renewal and modernisation of fixed assets used in the amount of 10% of direct costs. This cost is differentiated according to technological features.

The principle of pricing this service is not aimed at making a profit, as the state in the risky farming zone has undertaken to subsidise agricultural production. The service of supplying water for irrigation is a kind of subsidy to agribusiness in the form of reducing the cost of irrigation through state maintenance (operation) of irrigation systems and service personnel.

The peculiarity of cost formation is that the calculation of the cost of this service includes the cost of water supply[43], which is not covered by budget funding (including electricity, salaries, capital expenditures).

The cost of the service does not include the cost of water as a resource, as water management organisations are not primary water users.

Water was abstracted for irrigation in three oblasts in the basin. The cost of this service varied from UAH 1.11 to 5.63 as of June 2020 (Table 47).

Table 47. Cost of water abstraction for irrigation by regions of the Azov sea River basin, 2018-2020, UAH/m^3 (excluding VAT)[44]

Oblast	2018	2019	2020	including the cost of	
				electricity	own services
Donetsk	1,97-3,37	2,44-5,63	1,25-5,63	1,53-3,05	0,91-2,59
Zaporizhzhya	1,03-1,29	1,21-1,62	1,11-3,25	0,73-0,97	0,38-2,28
Kherson	0,86-1,28	1,07-1,55	1,25-1,72	0,781-1,238	0,3-0,3

[40] Article 245 of the Tax Code of Ukraine.

[41] The Procedure for Development and Approval of Maximum Permissible Discharge Standards for Pollutants, approved by the Cabinet of Ministers of Ukraine on 11.09.1996, No. 1100.

[42] The Procedure for Determining the Cost of Providing Paid Services by Budgetary Institutions Belonging to the Management of the State Agency of Water Resources of Ukraine, approved by Order No. 544/1561/1130 of 25 December 2013

[43] Water outlet point means a hydraulic structure, pumping station, canals and pipelines or reservoirs on the balance sheet of a water management organisation, from which or to which water is supplied (withdrawn) for the needs of water users.

[44] Compiled on the basis of letters: Nizhnii Dnipro RRB dated 01.06.2021 No. 08/286/3/538; Siverski-Donetsk RRB dated 31.05.2021 No. 09/1967.

Electricity accounts for 70% of the cost of water intake for irrigation. Over the past three years, the cost of this service has increased by 2-4 times, mainly due to the rising cost of electricity and partly due to the increase in the level of the basic social standard - the minimum wage.

Funds from the provision of these services are credited to the own revenues of water management organisations, which are used in accordance with the budget approved by the State Agency of Water Resources of Ukraine.

7 A REVIEW OF THE IMPLEMENTATION OF PROGRAMMES OR ACTIVITIES, INCLUDING HOW THE OBJECTIVES HAVE ACHIEVED

This section provides an overview of the budgetary programmes of various levels and funds implemented in the Azov Sea basin in 2019-2021 and containing measures aimed at improving the environmental status of the SWBs (Annex 10). The list of environmental protection areas and specific measures in the Programmes was determined by the Resolution of the Cabinet of Ministers of Ukraine (CMU) of 17.09.1996 No. 1147 (as amended).

According to the CMU Resolution No. 336 of 18 May 2017 - On Approval of the Procedure for Developing a River Basin Management Plan‖, the financing of software in the RBMP is carried out at the expense of the state and local budgets within the expenditures provided for in the State Budget of Ukraine for the relevant year. Other sources not prohibited by law may also be used for this purpose.

The National Target Programme for the Development of the Water Sector and Environmental Rehabilitation of the Dnipro River Basin for the Period up to 2021, approved by the Law of Ukraine No. 4836-VI dated 24.05.2012. The Programme is implemented by the State Agency of Water Resources of Ukraine (SAWR), hereinafter referred to as the SAWR Programme.

The purpose of the Programme is to define the main directions of state policy in the field of water management, conservation and restoration of water resources, implementation of the integrated water resources management system based on the basin principle, restoration of the role of reclaimed lands in the food and resource supply of the state, optimisation of water consumption, prevention and elimination of the consequences of harmful water impact.

The Programme was implemented in 2 phases - 2012-2016 and 2017-2021, and its main objectives were:

- harmonisation of Ukrainian legislation with international standards and improvement of the regulatory framework for innovation and investment development of the water sector (partially completed);
- Implementation of an effective, justified and balanced mechanism for the use, protection and reproduction of water resources, ensuring sustainable development of the state water monitoring system in accordance with international standards (achieved);
- Implementation of an integrated water resources management system based on the basin principle, development and implementation of river basin management plans, application of an economic model for targeted financing of activities in river basins, establishment of river basin councils, and enhancement of the role of existing and creation of new basin water resource management agencies (partially implemented;
- Improving the technological level of water use, introducing low-water and waterless technologies, developing more rational water use standards, construction, reconstruction and modernisation of water supply and sewage systems (partially completed;
- bank protection and regulation of river channels, construction and reconstruction of hydraulic structures, protective dams, polders, flood control reservoirs, clearing of river channels, arrangement of water protection zones and coastal protection strips, development of schemes for comprehensive flood protection of territories from harmful effects of water, improvement of methods and technical devices for hydrometeorological observations and flood forecasting (partially completed);
- Ensuring the development of land reclamation and improvement of the ecological condition of irrigated and drained lands, including restoration of the water management and reclamation complex, reconstruction and modernisation of reclamation systems and their facilities, engineering infrastructure of reclamation systems with the creation of integrated technological complexes, introduction of new methods of irrigation and land drainage, application of water and energy-saving, environmentally friendly irrigation and water management regimes (not implemented).

The planned amount of funding for the Programme was UAH 46478.46 million, including UAH 21029.03 million from the state budget, UAH 9294.20 million from the local budget, and UAH 16155.20 million from other sources. The amount of funding was approved annually when the draft law on the State Budget of Ukraine was prepared. Planned and actual expenditures in 2019 and 2021 are shown in Table 48.

Table 54. Planned and actual expenditures of the Programme (2019-2021)

	Source of funding	2019	2020	2021
Planned, UAH thousand	TOTAL	345 790,9	356 156,5	366 185,42
	State budget	*336 020*	*338 199*	*340 324*
	Local budget	*3871,7*	*12058,3*	*19 962,22*
	Other sources	*5899,2*	*5899,2*	*5899,2*

	Source of funding	2019	2020	2021
Actual expenditures, UAH thousand	*TOTAL*	*283 242,8*	*309 933*	*337 463,4*
	State budget	*281 649,9*	*292 902,6*	*310 370,1*
	Local budget	*1 592,9*	*17 030,4*	*27 093,27*
	Other sources			

An analysis of expenditures under the Programme showed that the bulk of them are financed from the state budget, while only a small part of funds comes from the local budget, namely 5.2%.

The state budget funds under the Programme were distributed across 4 budget programmes and 4 state investment projects. Among them, 90.8% of funding was allocated to the programme under - Operation of the State Water Management Complex and Water Resources Management - which performs tasks related to the operation of the state water management complex, water resources management (maintenance of budgetary institutions), state water monitoring for river basin areas (maintenance of budgetary institutions) and the development of RBMPs.

Within the Pryazovia River Basin, the financial resources of the Programme "Operation of the State Water Management Complex and Water Resources Management" were used to support the functions of the Pryazovia River Basin Water Resources Administration (hereinafter referred to as the Pryazovia River Basin Water Resources Administration) to operate the state water management complex, manage water resources, carry out state water monitoring (maintenance of budgetary institutions) and develop the RBMP for the Pryazovia River Basin. In 2019, a total of UAH 71,997.80 thousand was received, in 2020 - UAH 81,229.40 thousand and in 2021 - UAH 96,590.54 thousand. To ensure the operation of reclamation systems in Kherson region, the Lower Dnipro Basin Water Resources Administration (hereinafter referred to as the Lower Dnipro BWRA) of Kherson region was financed in the amount of UAH 200,853.5 thousand in 2019, UAH 202,995.2 thousand in 2020 and UAH 205,137 thousand in 2021. To ensure the operation of land reclamation systems in Donetsk Oblast, the Siverskoye-Donetskoye Water Resources Management of Donetsk Oblast was financed in the amount of UAH 8,799.4 thousand in 2019, UAH 8,678 thousand in 2020 and UAH 47,749.3 thousand in 2021.

In connection with the expiration of the TWA Programme in 2021, a draft Law of Ukraine "On Amendments to the National Target Programme for the Development of Water Management and Environmental Improvement of the Dnipro River Basin for the Period up to 2024" was developed. The estimated amount of funding for the Programme's tasks and activities until 2024 is UAH 41,265.05 million, including UAH 21,029.03 million from the state budget, UAH 7,545.65 million from local budgets, and UAH 12,690.37 million from other sources. The said law has not yet been adopted by the Verkhovna Rada of Ukraine.

The National Target Programme "Drinking Water of Ukraine" for 2011-2020, approved by the Law of Ukraine No. 2455-IV of 03.03.2005 and the Law of Ukraine of 20 October 2011

No. 3933-VI Source of funding 2019 2020 (hereinafter - the Drinking Water Programme). The Ministry of Regional Development, Construction, Housing and Communal Services of Ukraine (now the Ministry of Communities and Territories Development of Ukraine (MinRegion)) is the Programme's implementing agency.

The goal of the Drinking Water Programme was to ensure the rights of citizens to an adequate standard of living and environmental safety guaranteed by the Constitution of Ukraine, and to provide drinking water in the required volumes and in accordance with the established standards. The main goal was to be achieved through the development and reconstruction of centralised water supply and sewerage systems; protection of drinking water sources, bringing the quality of drinking water to the requirements of regulatory acts; regulatory support in the field of drinking water supply and sewerage; development and implementation of research and development projects using the latest materials, technologies, equipment and devices.

The estimated amount of funding for the Drinking Water Programme was UAH 9,471.7 million, of which UAH 3,004.3 million was allocated from the state budget and UAH 6,467.4 million from other sources.

Funding of the Drinking Water Programme was extremely unstable. The Ministry of Regional Development, as the state customer of the Drinking Water Programme, did not fully manage the Programme, which led to imperfect regulatory and organisational support for the implementation of the Programme's tasks and activities. The defined procedure for interaction and coordination of central and local executive authorities, local self-government bodies, enterprises, institutions and organisations on the implementation of the Drinking Water Programme was not applied.

In recent years, the Drinking Water Programme was funded only in 2011, 2012 and 2018, and after 2018 its funding was completely suspended. This state of organisation of the Programme's tasks has led to its implementation barely exceeding 13 per cent. The Government of Ukraine has decided to comprehensively address the drinking water problem by developing a new Programme until 2026 and ensuring stable funding for its activities. The concept of the National Targeted Social Programme "Drinking Water of Ukraine" for 2022-2026 was approved by the CMU Order No. 388-r dated 28.04.2021, and the Ministry of Communities and Territories Development, together with the interested central executive authorities, was instructed to develop and submit to the Cabinet of Ministers of

Ukraine the draft Law of Ukraine "On the National Targeted Social Programme "Drinking Water of Ukraine" for 2022-2026".

The State Budget Programme "Forestry and Hunting Management, Protection and Conservation of Forests in the Forest Fund", approved by the Laws of Ukraine On the State Budget of Ukraine for 2019: No. 2629-VIII dated 23.11.2018 and On the State Budget of Ukraine for 2020 dated 14.11.2019 No. 294-IX (hereinafter referred to as the Forest Programme), which is managed by the State Agency of Forest Resources of Ukraine.

The goal of the Forest Programme was to ensure the protection, efficient use, conservation and restoration of the forest and nature reserve fund of Ukraine, and its tasks included supporting the activities of budgetary institutions of forestry and hunting, as well as implementing measures for forest management and reforestation, and creating protective forest plantations.

The task of implementing forest management and reforestation measures was financed from a special fund at the expense of rent for the special use of forest resources. In 2019 and 2020, the amount of funding was UAH 316,533.3 thousand and UAH

UAH 288,183.7 thousand. All the funds from the special fund were used for forest management at the enterprises of the southeastern region.

In the context of the Pryazovia River Basin, reforestation was carried out at the expense of the regional fund and own funds of Zaporizhzhia Oblast enterprises on the area of 146.5 hectares in 2019 and 220.35 hectares in 2020. The planned measures to arrange field protection strips were not implemented.

The budget programme "Conservation of the Nature Reserve Fund" (hereinafter referred to as the NRF Programme).

In order to intensify the activities of the authorities in the field of nature reserves, a Presidential Decree was adopted of 23.05.2005 No. 838/2005 -On Measures for Further Development of Nature Reserve Management in Ukraine‖, pursuant to which the Ministry of Ecology and Natural Resources of Ukraine developed and submitted to the Verkhovna Rada of Ukraine a draft law of Ukraine -On Approval of the National Target Environmental Programme for the Development of Nature Reserves for the Period up to 2020‖ in 2008. The concept of this Programme was approved by the Cabinet of Ministers of Ukraine by its Resolution No. 70-r of 8 February 2006. However, the Programme was not supported by the Ministry of Finance and the Ministry of Economy.

Today, the development of the nature reserve fund does not have a separate target programme and is financed by the budget programme "Conservation of the nature reserve fund" under KPKVK 2701160, which is implemented by the Ministry of Ecology of Ukraine.

The programme was financed from the general and special funds of the State Budget of Ukraine and in 2019 amounted to UAH 389,317.6 thousand, of which the share of the general fund was 90%; in 2020 amounted to UAH 430,530.5 thousand, of which the share of the general fund was 94%; in 2021 amounted to UAH 686,771.3 thousand, of which the share of the general fund was 85%.

The main objective of the programme is to maintain the institutions of the nature reserve fund. The performance indicators under this programme were fully met.

Within the Pryazovia river basin, there are 3 national nature parks: Pryazovskyi (Zaporizhzhia region) , Meotida National Nature Park (Donetsk region) and the National Nature Park

-Azov-Sivash (Kherson region). In 2015, UAH 369 thousand was allocated from the regional budget to establish the boundaries of nature reserve fund objects on the ground. These funds were used to establish the boundaries of protected areas in Vasyliv, Melitopol and Berdiansk districts.

The State Target Programme for the Development of Land Relations in Ukraine for the period up to 2020,

The concept of which was approved by the CMU on 17 June 2009. No. 743-r (hereinafter referred to as the Land Programme).

The aim of the Land Programme is to improve land relations, help solve environmental and social problems in rural areas, and preserve the natural values of agricultural landscapes. Practical steps were planned to be implemented within the framework of regional programmes. Unfortunately, the state target programme was never adopted.

The Pryazovia river basin has an extremely unbalanced level of land use. The share of agricultural land reaches 82% in Zaporizhzhia Oblast, 77% in Donetsk Oblast, and 69% in Kherson Oblast. This degree of land use causes erosion and degradation, increasing the likelihood of diffuse water pollution. The condition of forest belts for on-farm and other land use is also unsatisfactory.

It is hoped that the introduction of the land market will facilitate the adoption of a new targeted Land Programme, the draft of which was published by the StateGeoCadastre of Ukraine on 06.07.2020 (draft CMU Order -On Approval of the Concept of the State Targeted Programme for the Development of Land Relations and National Geospatial Data Infrastructure in Ukraine for the Period up to 2030‖).

In support of the Land Programme, the Ministry of Agrarian Policy of Ukraine has developed a draft Order "On Approval of the Rules for Ensuring Soil Fertility and Use of Certain Agrochemicals", which establishes rules to reduce land pollution, protect it from degradation and reduce diffuse pollution of water bodies. The document is currently undergoing approval by the relevant central executive authorities.

The State Fund for Regional Development (SFRD) was created to accelerate the socio-economic development of regions in Ukraine. This allowed for the financing of regional development projects on a competitive basis and in accordance with regional development strategies and action plans for their implementation.

The distribution of the SFRD funds by administrative units and investment programmes and regional development projects is approved by the CMU in consultation with the Verkhovna Rada Committee on Budget.

In 2020, the SFRD financed 284 projects in the water supply and wastewater treatment sector with a total value of UAH 294 million.

In Zaporizhzhia region within the Azov river basin:

- In 2019, UAH 44.7 million was allocated from the SFRD (Order of the Cabinet of Ministers of Ukraine No. 351-r dated 15.05.2019, as amended), of which 2 projects were implemented to reconstruct water supply networks (Novouspenivka village, Melitopol district, from Davydivka village to Atmanai village, Melitopol district);

- In 2020, the project "Water supply to the city of Berdiansk by the Oblavvodokanal of the Zaporizhzhia Regional Council" was launched in the Azov River Basin. Overhaul of the pipeline from PC 503+45 to PC 513+50 near Volodymyrivka village, Melitopol district, Zaporizhzhia region. Correction", which was implemented during 2020-2021. UAH 7897.392 thousand was allocated from the SFRD for the project implementation in 2021 according to the CMU Resolution No. 297-p dated 12 April 2021.

In the Kherson region, within the Azov Sea rivers, the project "Reconstruction of Sewage Treatment Facilities in Henichesk, Kherson Region" was launched and will be implemented in 2017-2019 and 2021. The reconstruction of the sewage treatment plant in Henichesk was included in this year's list of "Big Construction" projects in the Kherson region. The works require funding of over UAH 14.58 million to complete. The co-financing from the city budget is over UAH 2.811 million.

The project resulted in the construction of 2 blocks of 500 cubic metres per day wastewater treatment plants and a 2300 m discharge header, as well as improved living and recreational conditions for the residents of Henichesk and seasonal residents in the resort and recreational area.

In order to finance environmental protection and resource conservation measures, the Law of Ukraine "On Environmental Protection" provides for the establishment of targeted environmental protection funds at both the state and local levels. The idea of these funds is that polluters should finance the improvement of the environmental condition of the object affected by their activities.

The State Fund for Stimulation and Financing of Environmental Protection Measures is hereinafter referred to as the State Environmental Fund (SEF). According to the CMU resolution

-On Approval of the Regulation on the State Environmental Protection Fund No. 634 dated 7.05.1998 (as amended by the CMU Resolution No. 1065 dated 4.12.2019) , the SEF is part of the State Budget of Ukraine.

The funds of the environmental tax levied on emissions, discharges of pollutants and waste disposal are distributed as follows: 45% is allocated to the general fund of the state budget; 55% - to the special fund of local budgets (except for the tax levied on radioactive waste generation). In turn, the special fund of local budgets is distributed between regional budgets and the budget of the Autonomous Republic of Crimea - 30% and village, town, city budgets, budgets of united territorial communities established in accordance with the law and the perspective plan for the formation of community territories - 25%.

An analysis of the use of environmental tax funds showed that they are being dispersed and not fully used for environmental protection measures. Out of the UAH 2,779.6 million of environmental tax collected in 2018, only UAH 522.3 million was allocated for environmental protection measures.

In 2019-2020, the State Investment Fund financed 4 state investment projects under the National Target Programme for the Development of Water Management and Environmental Improvement of the Dnipro River Basin until 2021.

The study of the conditions and procedure for financing environmental measures from the SEF led to the conclusion that the current regulations governing the procedure for opening financing of environmental measures from the State

Budget have been amended to block the possibility of regional and district administrations and local governments to receive funds.

The procedure for the use of funds allocated in the state budget for environmental protection measures is set out in CMU Resolution No. 163 of 28 February 2011. On 4 July 2018, the following amendments were made to CMU Resolution No. 163:

Clause 2 limited the types of activities that could be financed according to the list approved by CMU Resolution No. 1147.

Clause 3. The environmental protection plan shall be developed in accordance with the procedure established by The Ministry of Ecology, according to the following criteria: the general fund of the state budget is used exclusively for environmental protection measures carried out at state-owned facilities.

This information shows that the amendments introduced in 2018 to CMU Resolution No. 163 provide formal grounds for rejecting budget requests for financing environmental projects at municipal and other property.

In 2019-2021, a total of UAH 398,589.2 thousand was allocated from state programmes and funds for water protection measures in the Azov River Basin.

The Regional Environmental Protection Funds (REPFs) were a source of funding for environmental activities under 10 regional programmes that operated in Zaporizhzhia (4 programmes), Donetsk (3 programmes) and Kherson (3 programmes) oblasts in 2019-2021.

Given that funding for activities is based on the administrative-territorial principle, there is a need for coordinated action by public authorities to ensure integrated basin management.

The distribution of surface water bodies (SWBs) in the Azov Sea River basin according to the administrative principle is as follows: Zaporizhzhia oblast - 168 SWM, Kherson oblast - 41 SWM, Donetsk oblast - 296 SWMand Luhansk oblast – 50 SWM.

The Order of the Head of the Donetsk Regional State Administration, Head of the Regional Military-Civilian Administration (as amended on 04.08.2020 No. 826/5-20) "On Approval of the Programme Measures of the Regional Environmental Protection Fund for 2020" provided for the implementation of the following measures at the expense of the Regional Environmental Protection Fund

"Development of design and estimate documentation for the reconstruction of the technological part of the sewage treatment plant in Volnovakha", the customer of which was the Department of Ecology and Natural Resources of the Regional State Administration. The activity was completed in full for a total amount of UAH 545 thousand.

The Order of the Head of the Donetsk Regional State Administration, Head of the Regional Military-Civilian Administration (as amended on 10.03.2021 No. 172/5-21) "On Approval of the Programme Measures of the Regional Environmental Protection Fund for 2021" (as amended) provided for the implementation of the environmental measure "Reconstruction of the technological part of the sewage treatment facilities in Volnovakha" (the recipient of the regional budget funds is the municipal enterprise "Directorate for Capital Construction of Administrative and Residential Buildings").

The project was launched in October 2021, but construction work was suspended due to the large-scale invasion of the Russian Federation.

In accordance with the **Regional Target Programme for the Clearing and Regulation of Riverbeds for 2018-2022,** approved by the Order of the Head of the Donetsk Regional State Administration, Head of the Regional Military-Civilian Administration No. 1007/5-20 dated 10 September 2020, in 2020, 2 measures were planned to be implemented within the Azov River Basin at the expense of local budgets in the amount of UAH 1.6 million, namely

- preparation of design and estimate documentation for the project "Clearing the channel of the Mokra Bilosaraika River" in the village of Mangush, Mangush district, Donetsk region, for UAH 0.8 million;

- preparation of design and estimate documentation for the project "Clearing the Zelena Riverbed" in the village of Urzuf, Mangush district, Donetsk region, for UAH 0.8 million.

Due to the lack of funds in the local budget, these activities were not funded in 2020.

Also in 2020, the regional environmental protection fund financed the project "Drainage system from Nakhimov Avenue along Klenova Balka in the Primorsky district of Mariupol. Central spur. Extension to Metallurgov Avenue (design and construction)" in the amount of UAH 16.0 million was financed.

In accordance with the Programme of Economic and Social Development of Donetsk Oblast for 2019 and the main areas of development for 2020-2021, approved by the Head of Donetsk Oblast Regional State Administration, Head of the Regional Military-Civilian Administration of 01.02.2019 No. 79/5-19 (as amended) , the Programme of Economic and Social Development of Donetsk Oblast for 2020, approved by the order of the Head of Donetsk Regional State Administration, Head of the Regional Military-Civilian Administration of 27.12.2019 No. 1490/5-19 (as amended), the Programme of Economic and Social Development of Donetsk Oblast for 2021, approved by the order of the Head of Donetsk Oblast State Administration, Head of the Regional Military and Civil Administration dated 05.02.2021 No. 100/5-21 (as amended), 9 activities were implemented in the areas of "Protection and Rational Use of Water Resources" and "Science, Information, International Cooperation and Monitoring of Environmental Protection" within the Azov River Basin in 2019-2021 for a total amount of UAH 36.4 million:

- 1 measure for the amount of UAH 11.98 million (UAH 8.0 million from the regional fund and UAH 3.98 million from other sources) - Mariupol Mariupol (drainage system from Nakhimov Avenue along Klenova Balka in Prymorskyi district of Mariupol, extension to Metallurgiv Avenue);

- 2 measures worth UAH 3.35 million - installation of automated monitoring stations on the Kalmius (0.4% of the planned funds) and Kalchik (83% of the planned funds) rivers with real-time determination of water levels and quality indicators (mineralisation, nitrogen group, pH, temperature, etc.);

- 1 measure in the amount of UAH 0.071 million - modernisation of the environmental monitoring system designed to detect seawater pollutants (27.3%);

- 2 measures in the amount of UAH 4.09 million - installation of automated control posts on the Kalmius River in Volnovakha district (97% of the planned funds) and on the Kalchyk River in Donetsk region (90.1% of the planned funds), including adjustments to the working drafts;

- 1 measure in the amount of UAH 0.51 million - additional monitoring of surface water conditions in Donetsk Oblast in the basins of the Siverskyi Donets, Azov and Lower Dnipro rivers (83.6%);

- 1 measure in the amount of UAH 0.047 million - ensuring the operation of an automated environmental monitoring system designed to detect seawater pollutants (100%);

- 1 measure in the amount of UAH 8.49 million - reconstruction of the technological part of the sewage treatment plant in Volnovakha (25.1% of the planned funds).

Also in 2020, the regional environmental protection fund financed the project "Drainage system from Nakhimov Avenue along Klenova Balka in the Primorsky district of Mariupol. Central spur. Extension to Metallurgov Avenue (design and construction)" in the amount of UAH 16.0 million was financed.

In Zaporizhzhya Oblast, funding for activities from the regional funds is approved annually by a decision of the Zaporizhzhya Oblast Council as a general list.

The Regional Comprehensive Programme for Environmental Protection, Rational Use of Natural Resources and Environmental Safety in Zaporizhzhia Region, approved by the decision of the Zaporizhzhia Regional Council of 28.03.2013 No. 29, was developed in accordance with the basic principles (strategy) of the State Environmental Policy of Ukraine for the period up to 2020 and the NAP.

The programme aims to identify key areas of action, measures and resources to improve environmental safety in the region, develop a set of coordinated and interrelated environmental, legal, economic, organisational, technical and other measures to restore and ensure the sustainable functioning of all ecosystems in the region until 2020.

The following activities were carried out as part of the programme:

- reconstruction of existing and construction of new sewerage networks and facilities in settlements (construction of the second line of the pressure collector from SPS No. 5, D=500 mm, including design work in settlements of Berdiansk district). The amount of funding totalled UAH 12,566.3 thousand, including UAH 7,166 thousand from the regional budget and UAH 5,399.9 thousand from the local budget;

- Reconstruction of existing sewerage networks and construction of new ones in settlements and structures on them (development of design and estimate documentation "Reconstruction of sewerage networks and structures on them in Fruktove village, Melitopol district"). The amount of funding was UAH 46.2 thousand at the expense of the local budget;

- reconstruction of existing and construction of new sewerage networks and facilities in settlements (construction of a sewage pumping station in Naberezhne village, Prymorskyi district). The amount of funding was UAH 1944.1 thousand at the expense of the regional budget;

- Improvement of sewage facilities at housing and communal services, business facilities and urbanised areas (design and reconstruction of sewage treatment facilities in Chernihivka village, Berdiansk district). The amount of funding was UAH 1506.9 thousand at the expense of the regional budget.

The Regional Target Programme "Drinking Water of Zaporizhzhya Oblast" for 2012-2020 (hereinafter referred to as the **- Programme) was approved by the decision of Zaporizhzhya Regional Council No. 10 dated 31.05.2012, as amended, and is aimed at providing the population of Zaporizhzhya region with water supply and sewerage services of the appropriate level and quality in accordance with national standards.**

The following activities were carried out as part of the programme:

- construction and reconstruction of water intake facilities using the latest technologies and equipment (185 artesian wells in the settlements of Berdiansk, Vasyliv, Melitopol and Polohiv districts of Zaporizhzhia region). The amount of funding totalled UAH 17,463 thousand, including UAH 3,726 thousand from the state budget, UAH 12,867 thousand from the regional budget and UAH 870 thousand from the local budget;

- construction and reconstruction of water and sewage treatment facilities using the latest technologies and equipment (7 pumping stations and 6 water treatment facilities in the settlements of Berdiansk and Vasyliv districts of Zaporizhzhia region). The amount of funding totalled UAH 18,076 thousand, including UAH 12,169 thousand from the state budget, UAH 1,198 thousand from the regional budget and UAH 4,709 thousand from the local budget;

- reconstruction and overhaul of emergency water supply networks and facilities, as well as their construction in the settlements of Zaporizhzhia Oblast that are provided with centralised water supply systems (206.764 km of water supply networks, 29 water towers in the settlements of Berdiansk, Vasylivka, Melitopol and Pologiv districts of Zaporizhzhia Oblast). The amount of funding totalled UAH 66,066 thousand, including UAH 2,170 thousand from the state budget, UAH 56,624 thousand from the regional budget and UAH 7,272 thousand from the local budget;

- construction, reconstruction and overhaul of water pipelines (131.876 km of water pipelines in Vasyliv, Melitopol and Pologiv districts of Zaporizhzhia region). The amount of funding was UAH 111,033 thousand, of which UAH 92,751 thousand was allocated from the regional budget and UAH 18,282 thousand from the local budget;

- development of project documentation for water supply and sewerage facilities in the settlements of Zaporizhzhia Oblast (2 projects for the construction, reconstruction and overhaul of water supply networks and facilities in the settlements of Vasylivskyi and Melitopolskyi districts of Zaporizhzhia Oblast). The amount of funding totalled UAH 3,613 thousand, of which UAH 3,595 thousand came from the regional budget and UAH 18 thousand from the local budget;

- reconstruction and overhaul of emergency water supply networks and facilities, as well as their construction in the settlements of Zaporizhzhia Oblast that are provided with centralised water supply systems (6.902 km of water supply networks in the settlements of Vasylivskyi, Melitopolskyi and Pologivskyi districts of Zaporizhzhia Oblast). The amount of funding was UAH 13,837 thousand at the expense of the regional budget;

- construction, reconstruction and overhaul of water supply pipelines (8.417 km of water supply network in settlements of Melitopol and Pologivsky districts of Zaporizhzhia region). The amount of funding was UAH 42,382 thousand, of which UAH 31,332 thousand was allocated from the state budget and UAH 11,050 thousand from the regional budget.

As a result of the Programme implementation, water supply and sewerage were improved in the settlements of Berdiansk, Vasylivka, Polog and Melitopol districts Zaporizhzhia region.

The most problematic settlements in the Pryazovia river basin in terms of water supply and sewerage remain those in Prymorskyi and Pryazovian districts.

The Regional Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin in Zaporizhzhia Oblast for the period up to 2021 was approved by the decision of the Zaporizhzhia Oblast Council of 28.03.2013 No. 26, as amended.

The programme aims to increase the efficiency of the region's reclamation systems, restore the role of reclaimed land in the state's food and resource supply, implement state and regional water policy, provide centralised drinking water supply to rural settlements, improve the ecological state of rural areas and living conditions, meet the needs of the population and the region's economic sectors for water resources, optimise water consumption, prevent and eliminate water pollution, and

The following activities were carried out at the expense of local budgets as part of the programme:

- reconstruction of sewerage networks on Evropeiska Street in Berdiansk (UAH 235.6 thousand);
- econstruction of the sewerage collector on Intercultural street in Melitopol - UAH 117.6 thousand;
- reconstruction of intra-quarter sewerage networks from the Hospital Town on Kiziyarska Street in Melitopol - UAH 3,466.9 thousand;

- reconstruction of the pressure and gravity sewerage collector on Tchaikovsky Street in Melitopol - UAH 15,094.4 thousand;

- construction of t h e second line of the pressure sewer from No. 5 in Berdiansk - UAH 30.2 thousand.

In addition, Zaporizhzhia Oblast has developed a **programme for the environmental rehabilitation of the Molochna River basin, restoration of its hydrological regime, improvement and conservation of biodiversity until 2025**, approved by the Oblast Council on 26 December 2013, No. 14.

The programme was developed to identify a list of measures aimed at environmental rehabilitation of the basin, preventing the growth of anthropogenic impact on the river basin, ensuring environmentally safe living conditions for the population and economic activity and protecting water resources from pollution and depletion, conserving biodiversity, rational use of water resources, ensuring sustainable functioning of ecosystems, preventing harmful effects of water and eliminating its consequences.

The main executor of the Programme is the Department of Environmental Protection of Zaporizhzhia Oblast State Administration. According to the data provided by the Programme implementers, no funding was provided for the activities.

The Programme of Socio-Economic and Cultural Development of Zaporizhzhia Region for 2019, approved by the Regional Council on 20.12.2018 No. 59, the Programme of Socio-Economic and Cultural Development of Zaporizhzhia Region for 2020, approved by the Regional Council on 12.12.2019 No. 133, and the Programme of Socio-Economic and Cultural Development of Zaporizhzhia Region for 2021, approved by the Regional Council on 18.03.2021 No. 139.

In 2019, funds totalling UAH 98,219,905 thousand were allocated from the state budget for environmental protection measures in Zaporizhzhia Oblast, with UAH 20,485,736 thousand used by customers, including

- UAH 27,475,918 thousand was allocated from the State Budget for the construction of the environmental and educational visitor centre of the Azov National Nature Park, and UAH 2,990,0 thousand was spent;

- UAH 5,137,012 thousand was allocated from the state budget to create expositions for the environmental and educational visitor centre of the Azov National Nature Park, and UAH 85.8 thousand was spent;

- UAH 55,206,975 thousand was allocated from the state budget for the construction of a connecting canal to restore the water connection between the Azov Sea and the Molochny Estuary, and UAH 7,009,936 thousand was spent;

Thanks to a set of measures, the biological and landscape diversity of the Azov National Nature Park, which includes the Molochny Estuary, has been preserved.

The Programme for the Development of the Forestry Fund of Zaporizhzhia Region until 2022, approved by the Regional Council on 01.03.2018 No. 63, aims to protect the environment and overcome the main destabilising factors of the environmental situation, including soil erosion and river depletion.

The programme envisages the development of forestry in the region, including increasing the forest cover of the region at the expense of areas that can no longer be used for agricultural work due to land degradation.

The creation of protective forest plantations on eroded land (planting, sowing forests, caring for forest crops, tillage, harvesting forest seeds, growing standard seedlings and saplings) is intended to reduce the rate and volume of surface runoff, clean it from erosion products and nutrients and pesticides absorbed in it, stabilise unstable parts of the bank (landslides), and prevent siltation of the riverbed.

Within the Azov river basin and as part of these activities, the company planted and sowed forests in the area: In 2019, the area covered 146.5 hectares; in 2020, 220.35 hectares.

Funds were used to create protective forest plantations on eroded land:

In 2019 - UAH 1605.1 thousand. - from the regional budget; 1097.2 - other sources (own funds). In 2020 - UAH 1804 thousand. - from the regional budget; 814.75 - other sources (own funds).

In 2021, no funds were allocated from the regional budget for these measures.

In Kherson region, the **Comprehensive Programme for the Development of Water Management in Kherson Region until 2020** (as amended) was developed and approved by the decision of the XIV session of the sixth convocation of the Kherson Regional Council of 05 April 2012, No. 434, whose measures are correlated with the National Target Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin until 2021.

In 2019-2021, the Kherson Regional State Administration developed and approved proposals for the list of environmental protection measures for the Kherson region for 2019-2021.

In 2019, UAH 1,592.9 thousand was allocated from local budgets of various levels to implement measures to protect rural settlements and agricultural land in the Azov Sea basin within the Kherson region from the harmful effects of water. UAH 7.0 thousand was allocated to Novotroitsk district to implement measures to protect the district's settlements from flooding and flooding in Hromivka village council; UAH 1,585.9 thousand was allocated to Genichesk district for the reconstruction of sewage treatment facilities in Genichesk. In 2020, UAH 31,362 thousand was allocated to implement measures to protect the district's settlements from flooding and flooding in Hromivka village council and Novotroitske village council. In 2021, UAH 70,513 thousand was allocated to implement measures to protect the district's settlements from flooding in Novotroitske community (Syvaske urban-type settlement, Mayachka village).

In order to develop the environmental action plan for 2019, 2020 and 2021, the Lower Dnipro WRMPs were agreed with the Main Directorate of the State Emergency Service of Ukraine in Kherson Oblast and approved by the Oblast State Administration "Proposals for the formation of a list of environmental protection measures in Kherson region for 2019, 2020 and 2021", which were submitted to the State Agency of Ukraine for Water Resources.

The funds allocated by the State Agency of Water Resources of Ukraine under the budget programme were used to carry out construction works in 2019-2021 in the amount of UAH 95.975 million at the facilities:

- "New construction of the Ivanivka group water supply system from the village of Ivanivka, Ivanivka district, to the village of N. Sirohozy, Nizhneseirohozky district, Kherson region". One pumping station and a clean water reservoir were built.

- "New construction of the Ivanivka group water supply system from the village of N. Sirogozy to the village of V. Sirogozy in the Nizhneseerogozky district of Kherson region". A 6.18 km water supply network and a clean water reservoir were constructed. These measures will improve the reliability and water supply quality for 8,000 residents of the Ivanovo district.

The Regional Programme "Drinking Water of Kherson Region" for 2012-2020 was approved by the Kherson Regional Council on 10.05.2012 No. 472. The objective of the Programme is to ensure the rights of citizens to an adequate standard of living and environmental safety guaranteed b y the Constitution of Ukraine by providing drinking water in the required volumes and in accordance with the established standards.

As part of the Programme's activities, 8.1 km of sewerage networks were repaired in the region's settlements, and a scheme for optimising the operation of centralised water supply systems in Genichesk was developed, with a total funding of UAH 2847.1 thousand from the regional budget.

The analysis of the Programme implementation showed that the total amount of funding for measures aimed at improving the ecological status of surface waters in the Azov River Basin in 2019-2021 was UAH 713,032.8 thousand, of which the state budget provided UAH 398,589.2 thousand, the regional budget UAH 249,722.2 thousand, the local budget UAH 58,829.5 thousand and other sources - UAH 5,891.9 thousand. The dominant share of the above amount, namely 55.6%, was paid from the state budget.

Most of the state budget funds (46.7%) were used to implement environmental protection measures in Zaporizhzhia Oblast, namely the construction of an environmental education visitor centre in the Azov National Nature Park and the construction of a connecting channel to restore water communication between the Azov Sea and the Molochny Estuary.

The share of regional environmental protection funds and, accordingly, regional programmes was 35%, the local budget - 8.2%, and other sources - 0.8%.

Most of the funds from the regional budget, namely 71.3%, were used to finance environmental protection measures under the regional target programme "Drinking Water of Zaporizhzhia Oblast".

Due to military (hostilities), as well as the temporary occupation of the territories located in the Azov River Basin, funding for programmes aimed at developing the water sector has been partially suspended for an indefinite period until the end of the war.

8 A COMPLETE LIST OF PROGRAMMES (PLANS) FOR THE RIVER BASIN OR SUB-BASIN AREA, THEIR CONTENT AND PROBLEMS TO BE SOLVED

The PoM was developed in accordance with the "Methodological Recommendations for Setting Environmental Objectives, Developing a Programme of Measures and Performing a Cost-Effectiveness Analysis of the River Basin Management Plan" (Methodological Recommendations), approved at the meeting of the Scientific and Technical Council of the SAWR on 12 July 2023. The PoM have been developed by the Azov river BUVR in cooperation with local executive authorities, local governments, non-governmental organisations (NGOs), scientific and educational institutions and other stakeholders, taking into account proposals and decisions of the Azov river BUVR Basin Council.

The PoM is developed for a period of 6 years, starting with the first cycle of the plan for 2025-2030. The start of the measure implementation should be no later than the third year from the beginning of the cycle (no later than 1 January 2028). In total, the programme includes 78 measures (61 main and 17 additional).

A full list of measures is provided in Annex 11.

8.1 Surface water

For surface waters, the PoM includes measures aimed at:

- Reducing organic pollution (diffuse and point sources);
- Reducing nutrient pollution (diffuse and point sources);
- Reducing pollution by hazardous substances (diffuse and point sources);
- Improvement/restoration of the hydrological regime and morphological indicators in case of disruption of the free flow of rivers, hydraulic connection between river channels and their floodplains, hydrological changes, and modification of river morphology.

In addition to these measures, the PoM includes other measures aimed at addressing other SWMI of the Azov River Basin, identified in view of the specifics and transboundary nature of the basin.

8.1.1 Measures to reduce pollution by organic, nutrients and hazardous substances (diffuse and point sources)

The anthropogenic pressures on the SWB is primarily due to pollution with organic, biogenic and hazardous substances from sewage treatment plants (STPs) and diffuse sources.

Number of measures aimed at reducing pollution (diffuse and point sources):

- organic substances - 47;
- biogenic substances - 47;
- hazardous substances - 52.

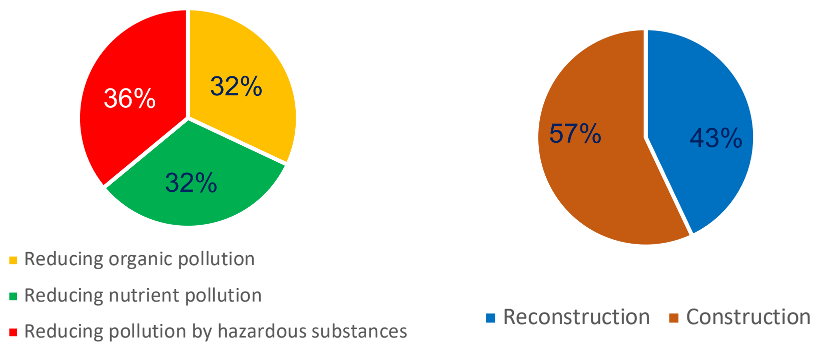


Figure 32. Measures aimed at reducing pollution by organic, biogenic and hazardous substances from point and diffuse sources and the way they are implemented (reconstruction or construction of STP and SN), %

Measures aimed at reducing pollution by biogenic substances (diffuse sources) also include "Establishment of water protection zones and banks protection strips within the Azov Sea River basin: Donetsk, Zaporizhzhia, Luhansk and Kherson Oblasts" (#60, Annex 11). The measure will cover four oblasts of the basin (including the temporarily occupied territory).

In accordance with the requirements of the Law of Ukraine "On Wastewater Disposal and Treatment" dated 12 January 2023 No. 2887-IX, in order to ensure high-quality centralised wastewater disposal while reducing the impact of return (wastewater) on the SWB, it is planned to build/reconstruct STPs and SNs for 51 settlements in the Azov River Basin with a population equivalent of 2,000 or more. Reconstruction/modernisation of STPs and SNs is envisaged in 37 communities, including 10 communities with tertiary (proper) wastewater treatment with removal of nitrogen and phosphorus compounds. Construction of new STPs and SNs is planned in 17 communities. After the de-occupation of a part of the basin, it is possible to aggregate (combine) the STPs and SNs of settlements into separate agglomerations (treatment clusters), a single sewage treatment complex around the cities: Melitopol, Berdiansk, Tokmak, with the unification of neighbouring communities.

Among the measures aimed at reducing pollution by organic, biogenic and hazardous substances (diffuse and point sources), 47 relate to SWBs that are "at risk" of failing to achieve environmental objectives. Measures aimed at reducing pollution by organic, biogenic and hazardous substances from point sources of pollution, depending on the risk assessment of the SWBs, are presented in Fig. 33.

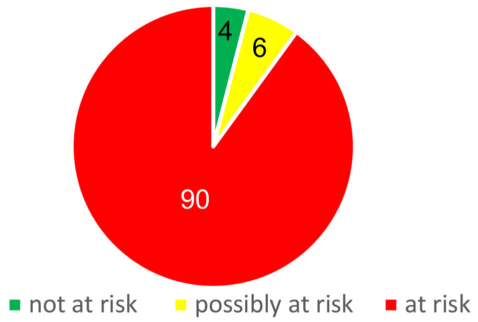


Figure 36. Measures aimed at reducing pollution by organic, biogenic and hazardous substances from point sources of pollution depending on the risk assessment of the SWBs, %

8.1.2 Measures aimed at improving/restoring the hydrological regime and morphological indicators

7 measures aimed at improving/restoring the hydrological regime and morphological indicators in case of disruption of the free flow of rivers, hydraulic connection between river channels and their floodplains, hydrological changes, and modification of river morphology. Three of them are planned as part of the implementation of the Programme for Environmental Rehabilitation of the Molochna River Basin, Restoration of its Hydrological Regime, Improvement and Conservation of Biodiversity, approved by the Zaporizhzhia Regional Council on 23 December 2013, No. 14.

In developing the measures, it was taken into account that the environmental objectives are to achieve "good" status for 7 SWBs. All of the SWBs have been assessed as "at risk".

In order to improve state accounting of water use, assessment of anthropogenic pressures and regulation of groundwater/surface water withdrawals, analysis of hydrological changes, and real-time balancing, the programme includes the measure: "Improvement of state accounting of water use within the districts of the Azov River Basin within Donetsk, Zaporizhzhia, Luhansk and Kherson Oblasts" (No. 61, Annex 11). All water users in the region are scheduled to install/modernise water metering devices with online data transmission.

8.2 Groundwater

The programme includes measures aimed at:

- reducing pollution (diffuse and point sources);
- preventing groundwater depletion;
- reducing the impact of planned infrastructure projects on water status.

It is mandatory to establish the boundaries of sanitary protection zones for groundwater intakes used for centralised water supply to the population, medical and recreational needs, indicate them in land management documentation, urban planning documentation at the local and regional levels, enter information on the relevant restrictions on land use in the State Land Cadastre and mark these boundaries on the ground with information signs. For groundwater abstractions with an extraction volume of more than 100 m^3 /day within the sanitary protection zones and adjacent territories, water users shall set up a local network of observation wells to determine the amount of water and chemical and physicochemical parameters and provide observation data to the State Service of Geology and Subsoil of Ukraine.

Due to the cessation of groundwater monitoring since 2018, all measures are considered additional measures that relate not to a separate groundwater monitoring, but to groundwater monitoring in general, namely:

1) Inventory of the observation well network. The inventory is necessary to resume monitoring observations and assess the need to drill additional observation wells.

2) Based on the results of the inventory, wells requiring repair, remedial plugging or conservation will be identified.

3) For non-pressure GWBs, it is advisable to arrange new observation points to characterise their quality state in areas with minimal anthropogenic impact on the quantitative and qualitative state of groundwater, including from point and diffuse sources.

4) At water intakes, where operational monitoring is carried out in accordance with the "Procedure for State Water Monitoring", it is necessary to reassess the operational groundwater reserves, which will allow for a more reliable assessment of the quantitative status of the GWB.

8.3 Other measures

Other measures include legislative and legal, administrative, fiscal, research and development, educational and awareness-raising, new technologies, environmental and communication, project, and other measures.

Other measures include, in particular, awareness-raising activities on water resources protection, conservation and restoration in all communities of the Azov sea RBD, information and awareness-raising activities with local communities, NGOs, schoolchildren and youth in the field of solid waste management. Implementation of local measures by local executive authorities to conserve, protect and restore water resources. It is planned to conduct scientific research on the impact of military operations on the status of the SWB in the temporarily occupied territories of Donetsk, Zaporizhzhia, Luhansk and Kherson oblasts, research to determine the impact of invasive species on the status of the SWB, and an inventory of waters and hydraulic structures in the Azov sea RBD after the de-occupation of the basin.

Analysis of the cost-effectiveness of the PoM

The cost-effectiveness analysis (CEA) was conducted only for the main measures.

The largest share of measures is aimed at reducing pollution of the SWB (80%). Some measures are aimed at addressing several SWMI. One third of the main measures relate to settlements with a population of 2 to 10 thousand - 23 (35%). For settlements with a population of 10 to 100 thousand, there are 21 measures (32%). These are measures in the administrative and district centres of the four regions of the basin: Tokmak, Prymorsk, Kalmiuske, Khartsyzsk, Volnovakha, Dokuchaevsk, Novoazovsk, Krestovka, Yenakiyevo, Uglegorsk, Shakhtarsk, Chistyakove and Snizhne. For settlements with a population of more than 100,000, 14 measures were held, in particular in Donetsk, Mariupol and Yenakiyevo TCs (Water of Donbas Company), the cities of Mariupol, Makiivka, Berdiansk and Melitopol.

The measures envisaged in the Programme will be financed from the state and local budgets, as well as other sources not prohibited by law. Financing of these measures from the state budget shall be carried out within the expenditures provided for in the State Budget of Ukraine for the relevant year.

The total cost of the main measures for the period 2025-2030 is UAH 24491 million, per TS (37) - UAH 661.9 million (UAH 110.3 million per year), per resident of the Azov Sea RBD affected by the measure (20.1 million people, data before the occupation) – UAH 1314 (UAH 219 per year). The most costly measures are the reconstruction/modernisation and construction of the STPs and SNs. For example, the measure to reconstruct the STPs and SNs in Makiivka (including the residential settlement of Khanzhekove-Pivnichne) of Makiivka community, Donetsk district, Donetsk region, requires UAH 6,976 million.

No measures with a very high level of effectiveness were identified among the main measures.

The group with a high level of efficiency includes 11 measures to reconstruct the STPs and SNs in the cities of Krestivka, Tokmak, Snizhne, Shakhtarsk, Chystyakove, Khartsyzsk, Yenakiyevo, Berdiansk, Melitopol, Mariupol, and Makiivka, with a total cost of UAH 19,109 million (78%). Social impact is expected for about 1.287 million people. These measures are aimed at reducing pollution by organic, biogenic and hazardous substances (SWMI 1 - 3). All of the targets of the measures belong to the sector of very high water use pressure - the housing and utilities sector.

The group with an medium level of efficiency includes 40 measures with a total cost of UAH 4,675 million (19%). Measures aimed at reducing pollution by organic, biogenic and hazardous substances (SWMI 1 - 3) and belonging to the very high-pressure water use sector (housing and utilities). Social impact - 1.950 million people. This group is the largest in terms of the number of measures.

The group with low efficiency includes 6 measures with a total cost of UAH 637 million (2%). These are mainly measures aimed at improving/restoring the hydrological regime and morphological indicators in case of disruption of the free flow of rivers, hydraulic connection between river channels and their floodplains, hydrological changes, and modification of river morphology (SWMI 4). Social effect - 415.0 thousand people.

The group with a very low level of effectiveness includes 4 measures with a total cost of UAH 70.1 million (1%) aimed at improving the hydromorphological indicators of rivers (SWMI 4). The implementation of these measures will achieve a social effect for 11.5 thousand people. The economic sector's pressure on water resources is minimal and corresponds to the lowest score.

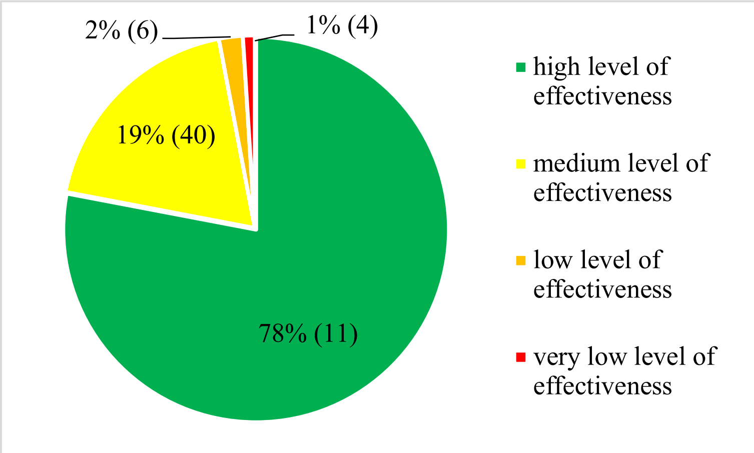


Figure 34. Distribution of main measures with different levels of efficiency by total cost of measures (number of measures in brackets)

A detailed CEA of the measures is provided in Annex 12.

9 REPORT ON PUBLIC INFORMATION AND PUBLIC DISCUSSION OF THE DRAFT RIVER BASIN MANAGEMENT PLAN

The basic requirements for organizing and conducting public consultations by executive authorities on the formation and implementation of state policy are set out in the Procedure for Conducting Public Consultations on the Formation and Implementation of State Policy, approved by Resolution of the Cabinet of Ministers of Ukraine No. 996 of November 03, 2010 (Official Gazette of Ukraine, 2010, No. 84, p. 2945) (hereinafter - Procedure No. 996).

In accordance with paragraph 5 of the Procedure, public consultations are organized and conducted by the executive body that is the main developer of the draft legal act. In accordance with paragraphs 11 and 12 of the Procedure, public consultations on draft legal acts that define strategic goals, priorities and objectives in the relevant area of public administration, affect the vital interests of citizens, including those that affect the state of the environment, are mandatory in the form of public public discussion and/or electronic public consultations.

In accordance with the second paragraph of clause 7 of the Procedure for Developing a River Basin Management Plan, public discussion of the draft river basin management plan is held for at least six months from the date of their publication. In accordance with the first paragraph of clause 8-1, the public has the right to provide comments and suggestions to the information on the main anthropogenic impacts on the quantitative and qualitative state of surface and groundwater, including point and diffuse sources, within six months from the date of their publication on the official website of the Ministry of Ecology.

Consultations in the process of drafting the RBMP

Resolution No. 336 of the Cabinet of Ministers of Ukraine of 18 May 2017 approved the Procedure for the Development of River Basin Management Plans (RBMPs), which are developed by the State Agency of Water Resources of Ukraine together with the State Service of Geology and Mineral Resources, central and local executive authorities, local governments, and other stakeholders, taking into account decisions of the relevant basin councils. At a meeting of the Azov Rivers Basin Council in 2019, the public was informed about the start of the RBMP development and the schedule of its development.

In order to ensure the preparation of the Programme of Measures (PoM), implementation of the orders and instructions of the State Agency of Water Resources dated 16 May 2022 No. 44 "On Approval of the Action Plan" and 18 December 2020 No. 1105 "On Development of Draft River Basin Management Plans", the Azov Rivers BUVR held meetings with district state administrations and local governments located within the Azov RBD. In addition to representatives of rayons and communities, the meetings were attended by experts from the Azov Rivers BUVR, members of the coordination working group for the preparation of RBMPs under the SAWR. The meetings addressed the need to take into account the need to plan for wartime and post-war measures.

Based on the results of the meetings and conferences, letters with proposals to identify SWMI and ways to address them were sent to the relevant departments of the oblasts within which the Azov RBD is located, to provide a list of programmes (plans) for planned measures aimed at addressing the identified SWMI and the consequences of military actions for 2025-2030. The BUVR has prepared requests to water users providing centralised water supply and sewerage services, industrial and agricultural enterprises discharging waste water into SWB of the Azov RBD to submit their proposals for the PoM aimed at addressing the SWMI of this basin.

Close cooperation with the Siverskyi Donets BUVR and the Lower Dnipro BUVR allowed us to obtain more detailed information on the PoM within the Azov RBD in Donetsk and Kherson oblasts and take their suggestions into account.

In reviewing the proposals received from district state administrations, local governments and business entities, the company identified SWMI in SWB (pollution by organic, biogenic and hazardous substances, hydro-morphological changes, uncontrolled water use, fouling, and the impact of military operations), urgent problems and ways to address them.

In 2022-2023, the Azov River BUVR held meetings and consultations with the public of Zaporizhzhia Oblast on the SWMI of the Azov RDB, the development and amendment of thr PoM for the Azov RBD, their content and the problems to be addressed to prepare the draft RBMP.

The materials received were processed, summarised and compiled in the form of a unified table, which was presented for review and discussion in July 2023 at a meeting of the Azov River Basin Council.

The collected and processed proposals for the PoM were presented for discussion at a meeting of the Azov River Basin Council.

Public consultations of the draft RBMP

The information notice on the public consultations of the draft RBMP (2025-2030) and the draft RBMPs was published on the website of the SAWR on 21 December 2023 at the link: https://davr.gov.ua/informacijne-povidomlennya-pro-provedennya-publichnogo-gromadskogo-obgovorennya-proyektiv-planiv-upravlinnya-richkovimi-basejnami-20252030

Information on the start of public consultations of draft RBMPs and draft RBMPs was published on the website of the Ministry of Ecology on 25 December 2023 at the link: https://mepr.gov.ua/ukrayina-zavershyla-robotu-nad-9-proyektamy-planiv-upravlinnya-richkovymy-basejnamy-rozpochalosya-gromadske-obgovorennya/

According to the information published in the announcement of the public consultations of the draft RBMP (2025-2030), comments and proposals in hard copy were accepted at the following address: State Agency of Water Resources of Ukraine, 8 Velyka Vasylkivska St., Kyiv, 01024, and in electronic form to the e-mail address rbmp@davr.gov.ua. The deadline for submitting comments and proposals to the draft RBMP was 21 June 2024.

As part of the public consultations, the SAWR, with the support of the EU4Environment project, initiated a series of public engagement activities, the schedule of which was announced on 28 February 2024 on the website at the link: https://davr.gov.ua/news/derzhvodagentstvo-iniciyuye-zahodi-iz-zaluchennya-gromadskosti-do-obgovorennya-proyektiv-purb

In particular, the invitation to public discussions of the draft RBMP for the Azov Rivers was published on the SAWR website for everyone on 27 March 2024 https://davr.gov.ua/news/provedennya-publichnogo-gromadskogo-obgovorennya-proyektu-planu-upravlinnya-richkovim-basejnom-richok-priazovya-20252030-roki

Azov river BUVR has sent out invitations to water users, all territorial communities and other stakeholders. The invitation to the public consultations of the draft RBMP for the Azov Rivers was also published on 12 March 2024 on the BUVR website at the link: https://buvrzp.gov.ua/2024/03/12/11-%D0%B1%D0%B5%D1%80%D0%B5%D0%B7%D0%BD%D1%8F-%D0%B2%D1%96%D0%B4%D0%B1%D1%83%D0%B4%D0%B5%D1%82%D1%8C%D1%81%D1%8F-%D0%BE%D0%BD%D0%BB%D0%B0%D0%B9%D0%BD-%D0%B7%D0%B0%D1%81%D1%96%D0%B4%D0%B0%D0%BD%D0%BD/

In order to present the results of the analysis of the status of the SWB in the Azov RBD and the relevant PoM, 7 infographics were developed: basin location features; SWMI; ecological status of the SWB (by biological indicators); chemical status of the SWB; hydromorphological changes; and PoM, on how to join public discussions.

The infographics are published on the website of the SAWR at the link: https://davr.gov.ua/plan-upravlinnya-richkovim-basejnom-richok-priazovya1

On 2 April 2024, an event was held in Zaporizhzhia to discuss the draft Azov RBMP. The event was attended by 76 participants, including representatives of government agencies, water management organisations, members of the basin council, representatives of local communities, water users in the basin, scientists, NGOs and stakeholders. The event presented the results of the analysis of the above-mentioned basin and the PoM, the vast majority of which relate to the construction or reconstruction of sewage treatment plants. This was followed by a discussion of the proposals and comments made by the participants to the draft RBMP. The results of the discussion are recorded in the Minutes (Annex 1 to the report on the results of the public discussion). Information about the event is available on the SAWR website https://davr.gov.ua/news/u-zaporizhzhi-vidbuvsya-zahid-z-gromadskogo-obgovorennya-proyektu-purb-richok-priazovya

The report on the results of the public consultations will be posted on the website of the SAWR and on the website of the Ministry of Environment.

Strategic environmental assessment of the draft RBMP

The procedure for conducting a strategic environmental assessment (SEA) is set out in the Law of Ukraine "On Strategic Environmental Assessment" No. 2354-VIII dated 20 March 2018. Pursuant to Article 9(3)(1) of the Law, one of the stages of the SEA is public discussion and consultations in accordance with the procedure set out in Articles 12 and 13 of the Law, as well as transboundary consultations in accordance with the procedure set out in Article 14 of the Law. Pursuant to part nine of Article 12 of the Law, "based on the results of the public discussion, the customer shall prepare a certificate on public discussion, which summarises the comments and proposals received and indicates how the state planning document and the strategic environmental assessment report take into account the comments and proposals submitted in accordance with this article (or justify their rejection), and also justifies the selection of this particular state planning document in the form in which it is proposed for approval, among other justified al The certificate shall be accompanied by the minutes of public hearings (if held) and written comments and suggestions received. The certificate on public discussion is public information and is entered by the customer into the Unified Register of Strategic Environmental Assessment."

The SEA procedure for the Azov sea RBMP was completed (registration number of the case in the Unified Register of Strategic Environmental Assessment 26-12-4035-23).

The certificate of public discussion of the draft RBMP will be entered by the SAWR into the Unified Register of Strategic Environmental Assessment together with the approved RBMP for the Azov Rivers.

10 A LIST OF COMPETENT STATE AUTHORITIES RESPONSIBLE FOR IMPLEMENTING THE RIVER BASIN MANAGEMENT PLAN

According to part two of Article 13 of the Water Code of Ukraine, the CMU, the Council of Ministers of the Autonomous Republic of Crimea, village, town and city councils and their executive bodies, district and regional councils, executive authorities and other state bodies are responsible for public administration in the field of water use and protection and water resources restoration in accordance with the legislation of Ukraine.

The executive authorities in the field of water use and protection and water resources reproduction are the Ministry of Ecology, the SAWR, the State Geological Survey, the State Ecological Inspectorate and other bodies in accordance with the law.

Table 49. Central executive authorities in the field of water use and protection and water resources restoration

Title	Address	Address of the official website
Ministry of Environmental Protection and Natural Resources of Ukraine (MENR)	35, Metropolyt Vasyl Lypkivskyi St., Kyiv, 03035 tel.: (044) 206-31-00, (044) 206-31-15, fax: (044) 206-31-07 E-mail: info@mepr.gov.ua	www.mepr.gov.ua
State Agency of Water Resources of Ukraine (SAWR)	8 Velyka Vasylkivska St., Kyiv, 01024 tel./fax: (044) 235-31-92, tel. (044) 235-61-46 E-mail: davr@davr.gov.ua	www.davr.gov.ua
State Service of Geology and Mineral Resources of Ukraine (Derzhgeonadra)	16 Anton Tsedik St., Kyiv, 03057 tel: (044) 536-13-18 E-mail: office@geo.gov.ua	www.geo.gov.ua
State Environmental Inspectorate of Ukraine (SEI)	3, building 2, Novopecherskyi lane, Kyiv, 01042 tel./fax +38 (044) 521-20-40, tel: (044) 521-20-38 E-mail: info@dei.gov.ua	www.dei.gov.ua

Table 50. Key regulatory acts that define the powers of executive authorities in the field of water use and protection and water resources reproduction

Name of the body	Legal act	Link on the official website of the Parliament Ukraine
Ministry of Environmental Protection and Natural Resources of Ukraine (MENR)	The Water Code of Ukraine of 6 June 1995, No. 213/95-BP (Bulletin of the Verkhovna Rada of Ukraine (VVR), 1995, No. 24, p. 189) - Articles 15 and 15[1]	https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text
	Regulation on the Ministry of Environmental Protection and Natural Resources of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of 25 June 2020, No. 614 (Official Gazette of Ukraine, 2020, No. 59, p. 32, Article 1853)	https://zakon.rada.gov.ua/laws/show/614-2020-%D0%BF#Text
State Agency of Water Resources of Ukraine (SAWR)	The Water Code of Ukraine of 6 June 1995, No. 213/95-BP (Bulletin of the Verkhovna Rada of Ukraine (VVR), 1995, No. 24, p. 189) - Article 16	https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text

Name of the body	Legal act	Link on the official website of the Parliament Ukraine
	Regulation on the State Agency of Water Resources of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of 20 August 2014, No. 393 (Official Gazette of Ukraine, 2014, No. 71, p. 34, Article 1995)	https://zakon.rada.gov.ua/laws/show/393-2014-%D0%BF#Text
State Service of Geology and Mineral Resources of Ukraine (Derzhgeonadra)	The Water Code of Ukraine of 6 June 1995, No. 213/95-BP (Bulletin of the Verkhovna Rada of Ukraine (VVR), 1995, No. 24, p. 189) - Article 17	https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text
	Regulation on the State Service of Geology and Subsoil of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of 30 December 2015 No. 1174 (Official Gazette of Ukraine, 2016, No. 3, p. 284, Article 192)	https://zakon.rada.gov.ua/laws/show/1174-2015-%D0%BF#Text
State Environmental Inspectorate of Ukraine (SEI)	The Water Code of Ukraine of 6 June 1995, No. 213/95-BP (Bulletin of the Verkhovna Rada of Ukraine (VVR), 1995, No. 24, p. 189) - Article 15[2]	https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text
	Regulation on the State Environmental Inspectorate of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of 19 April 2017, No. 275 (Official Gazette of Ukraine, 2017, No. 36, p. 73, Article 1131)	https://zakon.rada.gov.ua/laws/show/275-2017-%D0%BF#Text
	Regulations on Territorial and Interregional Territorial Bodies of the State Environmental Inspectorate, approved by the Order of the Ministry of Energy and Environmental Protection of Ukraine dated 07 April 2020 No. 230, registered with the Ministry of Justice of Ukraine on 16 April 2020 under No. 350/34633 (Official Gazette of Ukraine, 2020, No. 33, p. 25, Article 1116)	https://zakon.rada.gov.ua/laws/show/z0350-20#Text

In order to ensure the implementation of the state policy in the field of management, use and reproduction of surface water resources within the Azov river basin region, to direct and coordinate the activities of organisations under the management of the SAWR on management, use and reproduction of surface water resources within the Azov river basin region, as well as to ensure the implementation of the state policy in the field of water management within Zaporizhzhya region, the SAWR established the Basin Department.

Table 51. Representative of the central executive authority in the field of water use and protection and water resources reproduction in the Azov basin

Name of the organisation	Address	Telephone/fax	E-mail	Website
Azov River Basin Water Resources Management (Azov Sea Rivers BUVR)	69095, Zaporizhzhia, 105 Sobornyi Ave.	(061)787-49-63/ (061) 787-55-73	01038818@mail.gov.ua	www.buvrzp.gov.ua

(*Source:* https://davr.gov.ua/vodogospodarskiorganizacii)

The names of sub-basins and water management areas within river basin districts are given in the Annex to the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 25 "On the Allocation of Sub-Basins and Water Management Areas within Established River Basin Districts" dated 26 January 2017, registered with the

Ministry of Justice of Ukraine on 14 February 2017 under No. 208/30076 (https://zakon.rada.gov.ua/laws/show/z0208-17#Text).

The boundaries of river basin districts, sub-basins and water management areas were approved by the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 103 dated 03.03.2017, registered with the Ministry of Justice of Ukraine on 29 March 2017 under No. 421/30289 (https://zakon.rada.gov.ua/laws/show/z0421-17#Text).

The Azov Sea Rivers BUVR is a budgetary non-profit organisation that falls under the management of the SAWR. The Regulation on the Azov Sea Rivers BUVR was approved by the Order of the State Agency of Ukraine for Water Resources dated 25.07.2018 No. 558 (https://buvrzp.gov.ua/wp-content/uploads/polozhennya_buvr.pdf).

In order to develop proposals and ensure coordination of interests of enterprises, institutions and organisations in the field of water use and protection and water resources restoration within the Azov River Basin region, to promote integrated water resources management within the Azov River Basin region, to ensure coordination of interests and coordination of actions of stakeholders in water resources management within the Azov River Basin region, to facilitate cooperation between central and local executive authorities, local authorities and other stakeholders, the Council is an advisory body of the SAWR. The Pryazovia River Basin Council is an advisory body of the SAWR within the Azov Sea River Basin region. The Regulation on the Pryazovia River Basin Council was approved by the Order of the SAWR No. 850 dated 13.11.2018 (https://davr.gov.ua/polozhennya-pro-basejnovu-radu-richok-priazovya1).

According to the List approved by Resolution of the CMU No. 1371 dated 13 September 2002 (as amended by Resolution of the CMU No. 1276 dated 30 November 2011) (https://zakon.rada.gov.ua/laws/show/1371-2002-%D0%BF#n38), the Ministry of Ecology and/or the State Agency of Water Resources of Ukraine are responsible for fulfilling international obligations in the field of water protection arising from Ukraine's membership in international organisations or in accordance with international treaties concluded by Ukraine.

The Azov Sea river basin has transboundary waters, in particular: The Mius River, out of 258 km of its length, flows through Ukraine for only 90 km from its source; its tributaries, the Vilkhovchyk, 153 and 21.6 km, respectively, and the Krynka, 180 and 155 km; the Mokryi Yelanchyk River flows through Ukraine for 14 km out of 105 km, its tributary, the Sukhyi Yelanchyk, 77 and 19.4 km; another tributary, the Pavlivska River, flows through Ukraine partially from 10 to 5 km of its channel; the Hirka River, a tributary of the Gruzkyi Elanchyk, flows out and into the main river on the territory of our state, but twice enters the territory of the Russian Federation (rf).

In accordance with the Resolution of the CMU of December 30, 2022, No. 1488 “Termination of the Agreement between Ukraine and the Russian Federation on the Joint Use and Protection of Border Water Bodies” (Official Gazette of Ukraine, 2023, No. 4, p. 326), the Agreement between Ukraine and the Russian Federation on the Joint Use and Protection of Border Water Bodies (signed on October 19, 1992 in Kyiv) has been terminated. In fact, such cooperation has been suspended and has not been carried out since 2014.

11 THE PROCEDURE FOR OBTAINING INFORMATION, INCLUDING PRIMARY INFORMATION, ON THE STATE OF SURFACE AND GROUNDWATER

In order to ensure proper organization of access to public information, implementation of the Law of Ukraine “On Access to Public Information”, Decree of the President of Ukraine dated May 5, 2011 No. 547 “Issues of ensuring access to public information by executive bodies”, resolutions of the Cabinet of Ministers of Ukraine dated May 25, 2011 No. 583 “Issues of implementation of the Law of Ukraine “On Access to Public Information” in the Secretariat of the Cabinet of Ministers of Ukraine, central and local executive bodies” (Official Gazette of Ukraine, 2011, No. 41, p. 1694), dated October 21, 2015 No. 835 “On approval of the Regulation on data sets subject to publication in the form of open data” (Official Gazette of Ukraine, 2015, No. 85, p. 2850), by order of the Ministry of Environment dated December 2, 2021 No. 793, registered with the Ministry of Justice of Ukraine on February 1, 2022 under No. 123/37459, approved the Procedure for compiling, submitting and processing requests for information, managed by the Ministry of Environmental Protection and Natural Resources of Ukraine, a form for submitting a request for information in writing, a form for submitting a request for information by e-mail and a form for submitting a request for information by telephone.

To regulate the procedure for access to public information, the SAWR adopted Order No. 163 dated 08.12.2023 "On Certain Issues of Implementation of the Law of Ukraine "On Access to Public Information" in the SAWR".

In accordance with paragraphs 16-18 of the Procedure for State Water Monitoring, approved by Resolution of the Cabinet of Ministers of Ukraine No. 758 of 19 September 2018, the results of state water monitoring are:

- Primary information (observation data) provided by the subjects of state water monitoring;
- generalised data relating to a certain period of time or a certain territory;
- Assessment of the ecological and chemical state of surface water bodies, the ecological potential of artificial or significantly modified surface water bodies, the quantitative and chemical state of groundwater bodies, the ecological state of marine waters and identification of sources of negative impact on them;
- forecasts of water conditions and their changes;
- scientifically based recommendations necessary for making management decisions in the field of water use and protection and water resources reproduction.

Subjects of state water monitoring are obliged to store primary information (observation data) obtained as a result of state water monitoring for an indefinite period of time.

The information obtained and processed by the state water monitoring bodies is official.

Primary information (observation data), generalised data, assessment results, forecasts and recommendations resulting from the state water monitoring are provided free of charge:

- for SWBs (including coastal waters) - to the SAWR and the Ministry of Environment;
- for GWBs – to the State Service of Geology and Mineral Resources and the Ministry of Environment, as well as to the SAWR in terms of generalised data, assessment results and forecasts;
- for marine waters - the Ministry of Environment.

The subjects of state water monitoring shall exchange information with each other on the data and results of state water monitoring on a free-of-charge basis.

The SAWR collects and publishes information on the state of surface waters in the public domain by maintaining the following information resources:

- geoportal "State Water Cadastre: Accounting of Surface Water Bodies" (http://geoportal.davr.gov.ua:81/);
- the web-based system "Monitoring and Environmental Assessment of Water Resources of Ukraine" (http://monitoring.davr.gov.ua/EcoWaterMon/GDKMap/Index).

Automatic data exchange has been set up between these information resources and the Ministry of Ecology's EcoHazard resource.

ANNEXES

TO THE AZOV SEA RIVER BASIN

MANAGEMENT PLAN

2025-2030

Annex 1. List of identified SWBs in the Azov Sea RBD

The risk of not achieving the environmental objectives of the SWB: 1 – no risk, 2 – possibly at risk, 3 – at risk.

Linear SWBs

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Velyki Sirigozy	Big Agaimansky	–	34,5	HMWB	UA_M6.9_0001	1	2	3	3	1
Azov region	Velyki Sirigozy	Big Agaimansky	–	41,6	HMWB	UA_M6.9_0002	1	1	3	3	1
Azov region	Bolshaya Kalga	Domuzlinsky	UA_R_12_S_1_Si	3,4	river	UA_M6.9_0003	1	3	1	3	1
Azov region	Bolshaya Kalga	Domuzlinsky	–	1,1	HMWB	UA_M6.9_0004	1	3	3	3	1
Azov region	Bolshaya Kalga	Domuzlinsky	UA_R_12_S_1_Si	1,0	river	UA_M6.9_0005	1	2	1	2	1
Azov region	Bolshaya Kalga	Domuzlinsky	–	1,0	HMWB	UA_M6.9_0006	1	1	3	3	1
Azov region	Bolshaya Kalga	Domuzlinsky	UA_R_12_S_1_Si	6,0	river	UA_M6.9_0007	1	1	1	1	1
Azov region	Bolshaya Kalga	Domuzlinsky	–	1,1	HMWB	UA_M6.9_0008	1	1	3	3	1
Azov region	Bolshaya Kalga	Domuzlinsky	UA_R_12_S_1_Si	2,4	river	UA_M6.9_0009	1	1	1	1	1
Azov region	Bolshaya Kalga	Domuzlinsky	UA_R_12_M_1_Si	49,9	river	UA_M6.9_0010	1	1	1	1	1
Azov region	Untitled	Lake Sivash	UA_R_12_S_1_Si	2,4	river	UA_M6.9_0011	1	1	1	1	1
Azov region	Untitled	Lake Sivash	–	15,7	HMWB	UA_M6.9_0012	1	2	3	3	1
Azov region	Yatmanai	Lake Sivash	–	10,2	HMWB	UA_M6.9_0013	1	3	3	3	1
Azov region	Yatmanai	Lake Sivash	–	4,9	HMWB	UA_M6.9_0014	1	3	3	3	1
Azov region	Great Utliuk	Utliuk estuary	UA_R_12_M_1_Si	5,5	river	UA_M6.9_0015	1	3	1	3	1
Azov region	Great Utliuk	Utliuk estuary	–	2,5	HMWB	UA_M6.9_0016	1	3	3	3	1
Azov region	Great Utliuk	Utliuk estuary	UA_R_12_M_1_Si	1,8	river	UA_M6.9_0017	1	3	1	3	1
Azov region	Great Utliuk	Utliuk estuary	–	1,7	HMWB	UA_M6.9_0018	1	3	3	3	1
Azov region	Great Utliuk	Utliuk estuary	UA_R_12_M_1_Si	57,9	river	UA_M6.9_0019	1	3	1	3	2
Azov region	Great Utliuk	Utliuk estuary	–	1,8	HMWB	UA_M6.9_0020	1	3	3	3	1
Azov region	Great Utliuk	Utliuk estuary	–	24,9	HMWB	UA_M6.9_0021	1	3	3	3	1
Azov region	Little Utlyuk	Utliuk estuary	–	21,3	HMWB	UA_M6.9_0022	1	3	3	3	1
Azov region	Little Utlyuk	Utliuk estuary	UA_R_12_M_1_Si	51,2	river	UA_M6.9_0023	3	3	1	3	2
Azov region	Untitled	Little Utlyuk	–	2,3	HMWB	UA_M6.9_0024	1	3	3	3	1
Azov region	Untitled	Little Utlyuk	–	7,5	HMWB	UA_M6.9_0025	1	3	3	3	1
Azov region	Tashchenak	Molochny estuary	UA_R_12_S_1_Si	7,7	river	UA_M6.9_0026	1	3	1	3	1
Azov region	Tashchenak	Molochny estuary	UA_R_12_M_1_Si	48,9	river	UA_M6.9_0027	1	3	1	3	2
Azov region	Tashchenak	Molochny estuary	–	2,3	HMWB	UA_M6.9_0028	1	3	3	3	1
Azov region	Tashchenak	Molochny estuary	UA_R_12_M_1_Si	5,4	river	UA_M6.9_0029	1	3	1	3	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Dairy (Tokmak)	Molochny estuary	UA_R_12_S_2_Si	1,3	river	UA_M6.9_0030	1	3	1	3	1
Azov region	Dairy (Tokmak)	Molochny estuary	UA_R_12_S_2_Si	11,2	river	UA_M6.9_0031	1	3	1	3	1
Azov region	Dairy (Tokmak)	Molochny estuary	–	1,0	HMWB	UA_M6.9_0032	1	3	3	3	1
Azov region	Dairy (Tokmak)	Molochny estuary	UA_R_12_S_1_Si	6,2	river	UA_M6.9_0033	1	3	1	3	1
Azov region	Dairy (Tokmak)	Molochny estuary	UA_R_12_M_1_Si	21,8	river	UA_M6.9_0035	1	3	1	3	1
Azov region	Dairy (Tokmak)	Molochny estuary	UA_R_12_M_1_Si	39,7	river	UA_M6.9_0037	3	3	1	3	2
Azov region	Dairy (Tokmak)	Molochny estuary	UA_R_12_L_1_Si	106,4	river	UA_M6.9_0038	3	3	1	3	2
Azov region	Sisikulak	Dairy (Tokmak)	–	3,6	HMWB	UA_M6.9_0039	1	3	3	3	1
Azov region	Sisikulak	Dairy (Tokmak)	UA_R_12_S_1_Si	3,7	river	UA_M6.9_0040	1	3	1	3	1
Azov region	Sisikulak	Dairy (Tokmak)	–	1,2	HMWB	UA_M6.9_0041	1	3	3	3	1
Azov region	Sisikulak	Dairy (Tokmak)	UA_R_12_S_1_Si	5,6	river	UA_M6.9_0042	1	3	1	3	1
Azov region	Kainkula	Dairy (Tokmak)	UA_R_12_S_1_Si	12,0	river	UA_M6.9_0043	1	3	1	3	1
Azov region	Kainkula	Dairy (Tokmak)	UA_R_12_M_1_Si	1,8	river	UA_M6.9_0045	1	3	1	3	1
Azov region	Kainkula	Dairy (Tokmak)	–	2,3	HMWB	UA_M6.9_0046	1	3	3	3	1
Azov region	Kainkula	Dairy (Tokmak)	UA_R_12_M_1_Si	2,0	river	UA_M6.9_0047	1	3	1	3	1
Azov region	Chingul	Dairy (Tokmak)	–	15,2	HMWB	UA_M6.9_0048	1	3	3	3	1
Azov region	Chingul	Dairy (Tokmak)	UA_R_12_M_1_Si	18,8	river	UA_M6.9_0049	1	2	1	2	1
Azov region	Chingul	Dairy (Tokmak)	UA_R_12_M_1_Si	8,3	river	UA_M6.9_0051	1	2	1	2	1
Azov region	Kurkulak	Chingul	–	19,3	HMWB	UA_M6.9_0052	1	2	3	3	1
Azov region	Kurkulak	Chingul	UA_R_12_M_1_Si	7,9	river	UA_M6.9_0053	1	2	1	2	1
Azov region	Krulman	Dairy (Tokmak)	–	29,4	HMWB	UA_M6.9_0054	1	3	3	3	1
Azov region	Krulman	Dairy (Tokmak)	UA_R_12_M_1_Si	15,0	river	UA_M6.9_0055	1	2	1	2	1
Azov region	Krulman	Dairy (Tokmak)	–	1,7	HMWB	UA_M6.9_0056	1	2	3	3	1
Azov region	Krulman	Dairy (Tokmak)	UA_R_12_M_1_Si	24,4	river	UA_M6.9_0057	1	3	1	3	1
Azov region	Oponli	Krulman	–	13,3	HMWB	UA_M6.9_0058	1	3	3	3	1
Azov region	Kurushan	Krulman	UA_R_12_S_1_Si	22,7	river	UA_M6.9_0059	1	3	1	3	1
Azov region	Kurushan	Krulman	–	17,9	HMWB	UA_M6.9_0060	1	3	3	3	1
Azov region	Yushanli	Dairy (Tokmak)	UA_R_12_S_1_Si	18,4	river	UA_M6.9_0061	1	3	1	3	1
Azov region	Yushanli	Dairy (Tokmak)	UA_R_12_M_1_Si	13,6	river	UA_M6.9_0062	1	3	1	3	1
Azov region	Yushanli	Dairy (Tokmak)	–	2,4	HMWB	UA_M6.9_0063	1	3	3	3	1
Azov region	Yushanli	Dairy (Tokmak)	–	8,2	HMWB	UA_M6.9_0065	1	3	3	3	1
Azov region	Yushanli	Dairy (Tokmak)	UA_R_12_M_1_Si	49,0	river	UA_M6.9_0067	1	3	1	3	1
Azov region	Chukrak	Yushanli	UA_R_12_S_1_Si	11,4	river	UA_M6.9_0068	1	3	1	3	1
Azov region	Arabic	Dairy (Tokmak)	–	8,8	HMWB	UA_M6.9_0069	1	3	3	3	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Arabic	Dairy (Tokmak)	UA_R_12_M_1_Si	11,8	river	UA_M6.9_0070	1	3	1	3	1
Azov region	Arabic	Dairy (Tokmak)	–	2,1	HMWB	UA_M6.9_0071	1	3	3	3	1
Azov region	Arabic	Dairy (Tokmak)	UA_R_12_M_1_Si	11,8	river	UA_M6.9_0072	1	3	1	3	1
Azov region	Dzhekelnya	Molochny estuary	UA_R_12_M_1_Si	5,9	river	UA_M6.9_0073	1	2	1	2	1
Azov region	Dzhekelnya	Molochny estuary	–	3,1	HMWB	UA_M6.9_0074	1	2	3	3	1
Azov region	Dzhekelnya	Molochny estuary	UA_R_12_M_1_Si	9,2	river	UA_M6.9_0075	1	2	1	2	1
Azov region	Domuzla (Domuzgla)	Tubal estuary	UA_R_12_M_1_Si	8,1	river	UA_M6.9_0076	1	2	1	2	1
Azov region	Domuzla (Domuzgla)	Tubal estuary	–	1,8	HMWB	UA_M6.9_0077	1	2	3	3	1
Azov region	Domuzla (Domuzgla)	Tubal estuary	UA_R_12_M_1_Si	17,3	river	UA_M6.9_0078	1	2	1	2	1
Azov region	Domuzla (Domuzgla)	Tubal estuary	–	3,4	HMWB	UA_M6.9_0079	1	2	3	3	1
Azov region	Domuzla (Domuzgla)	Tubal estuary	UA_R_12_M_1_Si	2,3	river	UA_M6.9_0080	1	2	1	2	1
Azov region	Domuzla (Domuzgla)	Tubal estuary	–	3,1	HMWB	UA_M6.9_0081	1	2	3	3	1
Azov region	Domuzla (Domuzgla)	Tubal estuary	UA_R_12_M_1_Si	5,5	river	UA_M6.9_0082	1	2	1	2	1
Azov region	Akchokrak	Domuzla (Domuzgla)	UA_R_12_S_1_Si	11,6	river	UA_M6.9_0083	1	2	1	2	1
Azov region	Akchokrak	Domuzla (Domuzgla)	UA_R_12_M_1_Si	7,4	river	UA_M6.9_0084	1	2	1	2	1
Azov region	Akchokrak	Domuzla (Domuzgla)	–	2,4	HMWB	UA_M6.9_0085	1	2	3	3	1
Azov region	Akchokrak	Domuzla (Domuzgla)	–	1,3	HMWB	UA_M6.9_0086	1	2	3	3	1
Azov region	Akchokrak	Domuzla (Domuzgla)	UA_R_12_M_1_Si	4,9	river	UA_M6.9_0087	1	2	1	2	1
Azov region	Korsak	Sea of Azov	–	11,3	HMWB	UA_M6.9_0088	1	3	3	3	1
Azov region	Korsak	Sea of Azov	UA_R_12_M_1_Si	48,3	river	UA_M6.9_0089	1	3	1	3	1
Azov region	Metrology	Korsak	UA_R_12_S_1_Si	6,8	river	UA_M6.9_0090	1	2	1	2	1
Azov region	Metrology	Korsak	UA_R_12_M_1_Si	12,6	river	UA_M6.9_0091	1	2	1	2	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Apokny	Metrology	–	1,3	HMWB	UA_M6.9_0092	1	2	3	3	1
Azov region	Apokny	Metrology	UA_R_12_S_1_Si	14,5	river	UA_M6.9_0093	1	2	1	2	1
Azov region	Apokny	Metrology	UA_R_12_M_1_Si	14,7	river	UA_M6.9_0094	1	2	1	2	1
Azov region	Lozovatka	Sea of Azov	UA_R_12_S_1_Si	7,1	river	UA_M6.9_0095	1	3	1	3	1
Azov region	Lozovatka	Sea of Azov	–	1,1	HMWB	UA_M6.9_0096	1	3	3	3	1
Azov region	Lozovatka	Sea of Azov	UA_R_12_S_1_Si	3,9	river	UA_M6.9_0097	1	3	1	3	1
Azov region	Lozovatka	Sea of Azov	UA_R_12_M_1_Si	3,7	river	UA_M6.9_0098	1	3	1	3	1
Azov region	Lozovatka	Sea of Azov	UA_R_12_M_1_Si	55,13	river	UA_M6.9_0100	1	3	1	3	1
Azov region	Vowed	Sea of Azov	UA_R_12_S_1_Si	15,1	river	UA_M6.9_0101	1	3	1	3	1
Azov region	Vowed	Sea of Azov	UA_R_12_M_1_Si	6,0	river	UA_M6.9_0102	1	3	1	3	1
Azov region	Vowed	Sea of Azov	–	1,2	HMWB	UA_M6.9_0103	1	3	3	3	1
Azov region	Vowed	Sea of Azov	–	1,4	HMWB	UA_M6.9_0104	1	3	3	3	1
Azov region	Vowed	Sea of Azov	UA_R_12_M_1_Si	7,0	river	UA_M6.9_0105	1	3	1	3	1
Azov region	Vowed	Sea of Azov	–	1,5	HMWB	UA_M6.9_0106	1	3	3	3	1
Azov region	Vowed	Sea of Azov	UA_R_12_M_1_Si	11,7	river	UA_M6.9_0107	1	3	1	3	1
Azov region	Vowed	Sea of Azov	UA_R_12_M_1_Si	32,0	river	UA_M6.9_0109	1	3	1	3	1
Azov region	Vowed	Sea of Azov	UA_R_12_L_1_Si	29,6	river	UA_M6.9_0110	1	3	1	3	1
Azov region	Chokrak	Vowed	UA_R_12_S_1_Si	17,5	river	UA_M6.9_0111	1	3	1	3	1
Azov region	Chokrak	Vowed	–	1,2	HMWB	UA_M6.9_0112	1	3	3	3	1
Azov region	Chokrak	Vowed	–	1,6	HMWB	UA_M6.9_0113	1	3	3	3	1
Azov region	Chokrak	Vowed	UA_R_12_M_1_Si	6,7	river	UA_M6.9_0114	1	3	1	3	1
Azov region	Kiltychya	Vowed	UA_R_12_S_1_Si	7,1	river	UA_M6.9_0115	1	3	1	3	1
Azov region	Kiltychya	Vowed	–	1,2	HMWB	UA_M6.9_0116	1	3	3	3	1
Azov region	Kiltychya	Vowed	UA_R_12_S_1_Si	1,6	river	UA_M6.9_0117	1	3	1	3	1
Azov region	Kiltychya	Vowed	–	1,2	HMWB	UA_M6.9_0118	1	3	3	3	1
Azov region	Kiltychya	Vowed	UA_R_12_S_1_Si	4,9	river	UA_M6.9_0119	1	3	1	3	1
Azov region	Kiltychya	Vowed	UA_R_12_M_1_Si	15,7	river	UA_M6.9_0120	1	3	1	3	1
Azov region	Kiltychya	Vowed	–	1,5	HMWB	UA_M6.9_0121	1	3	3	3	1
Azov region	Kiltychya	Vowed	UA_R_12_M_1_Si	45,0	river	UA_M6.9_0122	1	3	1	3	1
Azov region	Burtichya	Kiltychya	UA_R_12_S_1_Si	5,2	river	UA_M6.9_0123	1	3	1	3	1
Azov region	Burtichya	Kiltychya	–	1,0	HMWB	UA_M6.9_0124	1	3	3	3	1
Azov region	Burtichya	Kiltychya	UA_R_12_S_1_Si	3,0	river	UA_M6.9_0125	1	3	1	3	1
Azov region	Burtichya	Kiltychya	–	1,0	HMWB	UA_M6.9_0126	1	3	3	3	1
Azov region	Burtichya	Kiltychya	UA_R_12_S_1_Si	2,8	river	UA_M6.9_0127	1	3	1	3	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Burtichya	Kiltychya	UA_R_12_S_1_Si	2,4	river	UA_M6.9_0129	1	3	1	3	1
Azov region	Burtichya	Kiltychya	UA_R_12_M_1_Si	0,8	river	UA_M6.9_0130	1	3	1	3	1
Azov region	Burtichya	Kiltychya	UA_R_12_M_1_Si	6,1	river	UA_M6.9_0132	1	3	1	3	1
Azov region	Salty	Sea of Azov	UA_R_12_S_1_Si	15,5	river	UA_M6.9_0133	1	3	1	3	1
Azov region	Kutsa Berdianka	Sea of Azov	UA_R_12_S_1_Si	19,7	river	UA_M6.9_0134	1	3	1	3	1
Azov region	Kutsa Berdianka	Sea of Azov	UA_R_12_M_1_Si	8,8	river	UA_M6.9_0135	1	3	1	3	1
Azov region	Berda	Sea of Azov	UA_R_12_S_2_Si	7,2	river	UA_M6.9_0136	1	3	1	3	1
Azov region	Berda	Sea of Azov	UA_R_12_S_1_Si	13,8	river	UA_M6.9_0137	1	3	1	3	1
Azov region	Berda	Sea of Azov	UA_R_12_M_1_Si	51,3	river	UA_M6.9_0138	1	3	1	3	1
Azov region	Berda	Sea of Azov	UA_R_12_L_1_Si	23,6	river	UA_M6.9_0139	1	3	1	3	1
Azov region	Berda	Sea of Azov	UA_R_12_L_1_Si	32,0	river	UA_M6.9_0141	1	3	1	3	1
Azov region	Bilmanka	Berda	UA_R_12_S_2_Si	4,1	river	UA_M6.9_0142	3	3	1	3	2
Azov region	Bilmanka	Berda	UA_R_12_S_1_Si	2,5	river	UA_M6.9_0143	1	3	1	3	1
Azov region	Bilmanka	Berda	UA_R_12_S_1_Si	8,8	river	UA_M6.9_0145	1	3	1	3	1
Azov region	Heavy	Berda	UA_R_12_S_1_Si	16,7	river	UA_M6.9_0146	1	3	1	3	1
Azov region	Heavy	Berda	UA_R_12_M_1_Si	1,3	river	UA_M6.9_0147	1	3	1	3	1
Azov region	Gruzka	Heavy	UA_R_12_S_1_Si	6,4	river	UA_M6.9_0148	1	3	1	3	1
Azov region	Gruzka	Heavy	–	1,5	HMWB	UA_M6.9_0149	1	3	3	3	1
Azov region	Gruzka	Heavy	UA_R_12_S_1_Si	6,1	river	UA_M6.9_0150	1	3	1	3	1
Azov region	Karatyuk	Berda	–	9,7	HMWB	UA_M6.9_0151	1	3	3	3	1
Azov region	Karatyuk	Berda	UA_R_12_S_1_Si	3,5	river	UA_M6.9_0153	1	3	1	3	1
Azov region	Karatyuk	Berda	UA_R_12_S_1_Si	5,5	river	UA_M6.9_0155	1	3	1	3	1
Azov region	Karatyuk	Berda	UA_R_12_M_1_Si	5,6	river	UA_M6.9_0157	1	3	1	3	1
Azov region	Karatyuk	Berda	–	1,8	HMWB	UA_M6.9_0159	1	2	3	3	1
Azov region	Temryuk	Karatyuk	UA_R_12_S_1_Si	5,9	river	UA_M6.9_0160	1	3	1	3	1
Azov region	Temryuk	Karatyuk	–	1,1	HMWB	UA_M6.9_0161	1	3	3	3	1
Azov region	Temryuk	Karatyuk	UA_R_12_S_1_Si	6,2	river	UA_M6.9_0162	1	3	1	3	1
Azov region	Temryuk	Karatyuk	–	1,0	HMWB	UA_M6.9_0163	1	3	3	3	1
Azov region	Temryuk	Karatyuk	UA_R_12_S_1_Si	9,4	river	UA_M6.9_0164	1	3	1	3	1
Azov region	Karate	Berda	–	0,6	HMWB	UA_M6.9_0165	1	2	3	3	1
Azov region	Karate	Berda	–	3,2	HMWB	UA_M6.9_0166	1	2	3	3	1
Azov region	Karate	Berda	UA_R_12_S_1_Si	3,5	river	UA_M6.9_0168	1	3	1	3	1
Azov region	Karate	Berda	–	1,4	HMWB	UA_M6.9_0169	1	3	3	3	1
Azov region	Karate	Berda	UA_R_12_S_1_Si	6,7	river	UA_M6.9_0170	1	3	1	3	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Karate	Berda	UA_R_12_M_1_Si	7,1	river	UA_M6.9_0171	1	3	1	3	1
Azov region	Karate	Berda	UA_R_12_M_1_Si	8,6	river	UA_M6.9_0173	1	2	1	2	1
Azov region	Karate	Berda	UA_R_12_M_1_Si	6,3	river	UA_M6.9_0175	1	2	1	2	1
Azov region	Untitled	Karate	UA_R_12_S_1_Si	8,0	river	UA_M6.9_0176	1	3	1	3	1
Azov region	Untitled	Karate	–	1,2	HMWB	UA_M6.9_0177	1	3	3	3	1
Azov region	Untitled	Karate	UA_R_12_S_1_Si	2,7	river	UA_M6.9_0178	1	3	1	3	1
Azov region	Water	Karate	–	6,6	HMWB	UA_M6.9_0179	1	3	3	3	1
Azov region	Water	Karate	–	1,4	HMWB	UA_M6.9_0180	1	3	3	3	1
Azov region	Water	Karate	UA_R_12_S_1_Si	6,5	river	UA_M6.9_0181	1	3	1	3	1
Azov region	Water	Karate	UA_R_12_S_1_Si	1,3	river	UA_M6.9_0183	1	3	1	3	1
Azov region	Water	Karate	UA_R_12_M_1_Si	4,1	river	UA_M6.9_0184	1	3	1	3	1
Azov region	Salty	Karate	UA_R_12_S_1_Si	16,0	river	UA_M6.9_0185	1	3	1	3	1
Azov region	Berestovaya	Berda	UA_R_12_S_1_Si	18,5	river	UA_M6.9_0186	1	3	1	3	1
Azov region	Berestovaya	Berda	–	1,3	HMWB	UA_M6.9_0187	1	3	3	3	1
Azov region	Berestovaya	Berda	UA_R_12_M_1_Si	10,9	river	UA_M6.9_0188	1	3	1	3	1
Azov region	Green	Sea of Azov	–	14,8	HMWB	UA_M6.9_0189	1	3	3	3	1
Azov region	Green	Sea of Azov	UA_R_12_M_1_Si	8,0	river	UA_M6.9_0191	1	2	1	2	1
Azov region	Komyshuvatka	Sea of Azov	UA_R_12_S_1_Si	4,8	river	UA_M6.9_0192	1	2	1	2	1
Azov region	Komyshuvatka	Sea of Azov	–	1,1	HMWB	UA_M6.9_0193	1	2	3	3	1
Azov region	Komyshuvatka	Sea of Azov	UA_R_12_S_1_Si	2,2	river	UA_M6.9_0194	1	2	1	2	1
Azov region	Komyshuvatka	Sea of Azov	–	1,5	HMWB	UA_M6.9_0195	1	2	3	3	1
Azov region	Komyshuvatka	Sea of Azov	UA_R_12_S_1_Si	8,7	river	UA_M6.9_0196	1	2	1	2	1
Azov region	Komyshuvatka	Sea of Azov	UA_R_12_M_1_Si	1,1	river	UA_M6.9_0197	1	2	1	2	1
Azov region	Komyshuvatka	Sea of Azov	–	1,1	HMWB	UA_M6.9_0198	1	2	3	3	1
Azov region	Komyshuvatka	Sea of Azov	–	1,0	HMWB	UA_M6.9_0199	1	2	3	3	1
Azov region	Komyshuvatka	Sea of Azov	UA_R_12_M_1_Si	7,9	river	UA_M6.9_0200	1	2	1	2	1
Azov region	Wet Belosarayskaya	Sea of Azov	–	17,9	HMWB	UA_M6.9_0201	1	2	3	3	1
Azov region	Wet Belosarayskaya	Sea of Azov	–	15,2	HMWB	UA_M6.9_0202	1	2	3	3	1
Azov region	Kalmius	Sea of Azov	UA_R_16_S_2_Ca	1,1	river	UA_M6.9_0203	3	2	1	3	2
Azov region	Kalmius	Sea of Azov	UA_R_16_S_1_Ca	5,0	river	UA_M6.9_0205	1	2	1	2	1
Azov region	Kalmius	Sea of Azov	UA_R_16_S_1_Si	5,7	river	UA_M6.9_0206	1	1	1	1	1
Azov region	Kalmius	Sea of Azov	UA_R_16_S_1_Si	0,5	river	UA_M6.9_0208	1	1	1	1	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Kalmius	Sea of Azov	UA_R_16_M_1_Si	35,0	river	UA_M6.9_0209	1	1	1	1	1
Azov region	Kalmius	Sea of Azov	UA_R_16_L_1_Si	78,3	river	UA_M6.9_0211	1	1	1	1	1
Azov region	Kalmius	Sea of Azov	UA_R_16_L_1_Si	44,0	river	UA_M6.9_0213	3	1	1	3	2
Azov region	Wide	Kalmius	UA_R_16_S_1_Si	7,4	river	UA_M6.9_0214	1	1	1	1	1
Azov region	Wide	Kalmius	UA_R_16_S_1_Si	1,3	river	UA_M6.9_0216	1	1	1	1	1
Azov region	Bogodukhova	Kalmius	–	0,9	HMWB	UA_M6.9_0217	1	1	3	3	1
Azov region	Bogodukhova	Kalmius	–	3,9	HMWB	UA_M6.9_0218	1	1	3	3	1
Azov region	Bogodukhova	Kalmius	UA_R_16_S_1_Si	10,7	river	UA_M6.9_0219	1	1	1	1	1
Azov region	Gruzka	Kalmius	UA_R_16_S_2_Ca	0,4	river	UA_M6.9_0220	1	2	1	2	1
Azov region	Gruzka	Kalmius	–	8,9	HMWB	UA_M6.9_0221	1	2	3	3	1
Azov region	Gruzka	Kalmius	UA_R_16_M_1_Ca	15,0	river	UA_M6.9_0222	3	2	1	3	2
Azov region	Gruzka	Kalmius	UA_R_16_M_1_Si	23,0	river	UA_M6.9_0223	1	1	1	1	1
Azov region	Kalinova	Gruzka	UA_R_16_S_2_Ca	3,6	river	UA_M6.9_0224	1	2	1	2	1
Azov region	Kalinova	Gruzka	UA_R_16_S_1_Ca	5,6	river	UA_M6.9_0225	1	2	1	2	1
Azov region	Kalinova	Gruzka	–	1,1	HMWB	UA_M6.9_0226	1	2	3	3	1
Azov region	Kalinova	Gruzka	UA_R_16_S_1_Ca	4,2	river	UA_M6.9_0227	1	2	1	2	1
Azov region	Kolesnikova	Gruzka	–	4,2	HMWB	UA_M6.9_0228	1	1	3	3	1
Azov region	Kolesnikova	Gruzka	UA_R_16_S_1_Ca	1,9	river	UA_M6.9_0229	3	1	1	3	2
Azov region	Kolesnikova	Gruzka	UA_R_16_S_1_Ca	8,1	river	UA_M6.9_0231	1	2	1	2	1
Azov region	B. Acidic	Gruzka	–	12,3	HMWB	UA_M6.9_0232	1	1	3	3	1
Azov region	Berestovaya	Kalmius	UA_R_16_S_1_Si	13,9	river	UA_M6.9_0233	1	1	1	1	1
Azov region	Berestova	Kalmius	UA_R_16_M_1_Si	5,1	river	UA_M6.9_0234	1	1	1	1	1
Azov region	Berestovaya	Kalmius	UA_R_16_M_1_Si	5,1	river	UA_M6.9_0236	1	1	1	1	1
Azov region	Komyshuvakha	Kalmius	UA_R_16_S_1_Si	3,8	river	UA_M6.9_0237	1	1	1	1	1
Azov region	Komyshuvakha	Kalmius	–	1,2	HMWB	UA_M6.9_0238	1	1	3	3	1
Azov region	Komyshuvakha	Kalmius	UA_R_16_S_1_Si	11,1	river	UA_M6.9_0239	1	1	1	1	1
Azov region	Loikova	Kalmius	–	12,2	HMWB	UA_M6.9_0240	1	1	3	3	1
Azov region	Loikova	Kalmius	UA_R_16_M_1_Si	4,5	river	UA_M6.9_0241	1	1	1	1	1
Azov region	Loikova	Kalmius	–	1,9	HMWB	UA_M6.9_0242	1	1	3	3	1
Azov region	Loikova	Kalmius	UA_R_16_M_1_Si	6,9	river	UA_M6.9_0243	1	1	1	1	1
Azov region	Wet Volnovakha	Kalmius	UA_R_16_S_2_Si	3,7	river	UA_M6.9_0244	3	1	1	3	2
Azov region	Wet Volnovakha	Kalmius	UA_R_16_S_1_Si	8,6	river	UA_M6.9_0245	1	1	1	1	1
Azov region	Wet Volnovakha	Kalmius	UA_R_16_M_1_Si	9,6	river	UA_M6.9_0247	1	1	1	1	1
Azov region	Wet Volnovakha	Kalmius	UA_R_16_M_1_Si	32,0	river	UA_M6.9_0249	1	1	1	1	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Baklamashova	Wet Volnovakha	UA_R_16_S_2_Si	2,0	river	UA_M6.9_0250	1	1	1	1	1
Azov region	Baklamashova	Wet Volnovakha	UA_R_16_S_1_Si	9,0	river	UA_M6.9_0251	1	1	1	1	1
Azov region	Dry Volnovakha	Wet Volnovakha	–	3,7	HMWB	UA_M6.9_0252	3	1	3	3	2
Azov region	Dry Volnovakha	Wet Volnovakha	UA_R_16_S_1_Si	13,5	river	UA_M6.9_0253	3	1	1	3	2
Azov region	Dry Volnovakha	Wet Volnovakha	UA_R_16_M_1_Si	29,9	river	UA_M6.9_0254	1	1	1	1	1
Azov region	B. Dolin-Tamara	Dry Volnovakha	UA_R_16_S_1_Si	1,3	river	UA_M6.9_0255	1	1	1	1	1
Azov region	B. Dolin-Tamara	Dry Volnovakha	UA_R_16_S_1_Si	5,3	river	UA_M6.9_0257	1	1	1	1	1
Azov region	B. Dolin-Tamara	Dry Volnovakha	UA_R_16_S_1_Si	2,6	river	UA_M6.9_0259	1	1	1	1	1
Azov region	Balmatour	Dry Volnovakha	UA_R_16_S_1_Si	8,9	river	UA_M6.9_0260	1	1	1	1	1
Azov region	Balmatour	Dry Volnovakha	–	1,1	HMWB	UA_M6.9_0261	1	1	3	3	1
Azov region	Balmatour	Dry Volnovakha	UA_R_16_S_1_Si	3,9	river	UA_M6.9_0262	1	1	1	1	1
Azov region	Komyshuvakha	Wet Volnovakha	UA_R_16_S_1_Si	17,8	river	UA_M6.9_0263	1	1	1	1	1
Azov region	Komyshuvakha	Wet Volnovakha	UA_R_16_S_1_Si	1,1	river	UA_M6.9_0265	1	1	1	1	1
Azov region	B. Bloody	Kalmius	UA_R_16_S_1_Si	11,9	river	UA_M6.9_0266	1	1	1	1	1
Azov region	Dubivka	Kalmius	UA_R_16_S_1_Si	10,4	river	UA_M6.9_0267	1	1	1	1	1
Azov region	Dubivka	Kalmius	UA_R_16_S_1_Si	4,1	river	UA_M6.9_0269	1	1	1	1	1
Azov region	Dubivka	Kalmius	UA_R_16_M_1_Si	5,3	river	UA_M6.9_0270	1	1	1	1	1
Azov region	Kichiksu	Kalmius	UA_R_16_S_1_Si	4,7	river	UA_M6.9_0271	1	1	1	1	1
Azov region	Kichiksu	Kalmius	UA_R_16_S_1_Si	7,3	river	UA_M6.9_0273	1	1	1	1	1
Azov region	Kichiksu	Kalmius	UA_R_16_M_1_Si	1,3	river	UA_M6.9_0274	1	1	1	1	1
Azov region	Kichiksu	Kalmius	UA_R_16_M_1_Si	5,2	river	UA_M6.9_0276	1	1	1	1	1
Azov region	Karansu	Kichiksu	UA_R_16_S_2_Si	1,0	river	UA_M6.9_0277	1	1	1	1	1
Azov region	Karansu	Kichiksu	UA_R_16_S_1_Si	8,8	river	UA_M6.9_0278	1	1	1	1	1
Azov region	Ternovaya	Kalmius	UA_R_16_S_1_Si	15,7	river	UA_M6.9_0279	1	1	1	1	1
Azov region	Willow	Kalmius	UA_R_16_S_1_Si	11,7	river	UA_M6.9_0280	1	1	1	1	1
Azov region	Calculator	Kalmius	–	1,6	HMWB	UA_M6.9_0281	1	3	3	3	1
Azov region	Calculator	Kalmius	UA_R_16_S_1_Si	1,6	river	UA_M6.9_0282	1	2	1	2	1
Azov region	Calculator	Kalmius	–	1,5	HMWB	UA_M6.9_0283	1	2	3	3	1
Azov region	Calculator	Kalmius	UA_R_16_S_1_Si	6,0	river	UA_M6.9_0284	1	2	1	2	1
Azov region	Calculator	Kalmius	–	1,4	HMWB	UA_M6.9_0285	1	2	3	3	1
Azov region	Calculator	Kalmius	UA_R_16_S_1_Si	5,1	river	UA_M6.9_0286	1	2	1	2	2
Azov region	Calculator	Kalmius	–	1,8	HMWB	UA_M6.9_0287	1	3	3	3	1
Azov region	Calculator	Kalmius	UA_R_16_M_1_Si	37,7	river	UA_M6.9_0288	1	2	1	2	1
Azov region	Calculator	Kalmius	UA_R_16_L_1_Si	24,5	river	UA_M6.9_0290	3	2	1	3	2

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Kalmycka	Calculator	UA_R_16_S_1_Si	16,4	river	UA_M6.9_0291	1	2	1	2	1
Azov region	b. Gruzka	Calculator	UA_R_16_S_1_Si	12,7	river	UA_M6.9_0292	1	2	1	2	1
Azov region	b. Veli Tarama	Calculator	UA_R_16_S_1_Si	15,9	river	UA_M6.9_0293	1	1	1	1	1
Azov region	b. Veli Tarama	Calculator	UA_R_16_S_1_Si	7,6	river	UA_M6.9_0295	1	1	1	1	2
Azov region	b. Veli Tarama	Calculator	UA_R_16_M_1_Si	7,8	river	UA_M6.9_0296	1	2	1	2	1
Azov region	Regimental	Calculator	UA_R_16_S_1_Si	13,2	river	UA_M6.9_0297	1	1	1	1	1
Azov region	Regimental	Calculator	–	1,0	HMWB	UA_M6.9_0298	1	1	3	3	1
Azov region	Regimental	Calculator	UA_R_16_S_1_Si	4,7	river	UA_M6.9_0299	1	2	1	2	1
Azov region	Little Kalchik	Calculator	UA_R_16_S_2_Si	2,6	river	UA_M6.9_0300	1	1	1	1	1
Azov region	Little Kalchik	Calculator	–	1,1	HMWB	UA_M6.9_0301	1	1	3	3	1
Azov region	Little Kalchik	Calculator	UA_R_16_S_1_Si	7,2	river	UA_M6.9_0302	3	1	1	3	2
Azov region	Little Kalchik	Calculator	UA_R_16_S_1_Si	5,6	river	UA_M6.9_0304	1	1	1	1	1
Azov region	Little Kalchik	Calculator	UA_R_16_M_1_Si	6,2	river	UA_M6.9_0306	1	1	1	1	1
Azov region	Little Kalchik	Calculator	–	2,1	HMWB	UA_M6.9_0307	1	1	3	3	1
Azov region	Little Kalchik	Calculator	UA_R_16_M_1_Si	8,4	river	UA_M6.9_0309	1	3	1	3	2
Azov region	Kalets	Calculator	UA_R_16_S_1_Si	6,0	river	UA_M6.9_0310	1	3	1	3	1
Azov region	Kalets	Calculator	–	1,1	HMWB	UA_M6.9_0311	1	3	3	3	1
Azov region	Kalets	Calculator	UA_R_16_S_1_Si	5,1	river	UA_M6.9_0312	1	3	1	3	1
Azov region	Kalets	Calculator	UA_R_16_M_1_Si	2,6	river	UA_M6.9_0313	1	3	1	3	1
Azov region	Kalets	Calculator	UA_R_16_M_1_Si	4,3	river	UA_M6.9_0315	1	3	1	3	1
Azov region	Wide	Sea of Azov	UA_R_16_S_1_Si	3,6	river	UA_M6.9_0316	1	1	1	1	1
Azov region	Wide	Sea of Azov	–	1,9	HMWB	UA_M6.9_0317	1	1	3	3	1
Azov region	Wide	Sea of Azov	UA_R_16_S_1_Si	17,6	river	UA_M6.9_0318	1	1	1	1	1
Azov region	Wide	Sea of Azov	UA_R_16_M_1_Si	3,7	river	UA_M6.9_0319	1	1	1	1	1
Azov region	Bolshaya Namennaya	Sea of Azov	UA_R_16_S_1_Si	22,2	river	UA_M6.9_0320	1	1	1	1	1
Azov region	Bolshaya Namennaya	Sea of Azov	UA_R_16_M_1_Si	17,2	river	UA_M6.9_0321	1	1	1	1	1
Azov region	Gruzky Elanchik	Sea of Azov	UA_R_16_S_1_Ca	12,1	river	UA_M6.9_0322	1	1	1	1	1
Azov region	Gruzky Elanchik	Sea of Azov	UA_R_16_M_1_Ca	2,1	river	UA_M6.9_0324	1	1	1	1	1
Azov region	Gruzky Elanchik	Sea of Azov	–	1,2	HMWB	UA_M6.9_0325	1	1	3	3	1
Azov region	Gruzky Elanchik	Sea of Azov	UA_R_16_M_1_Ca	2,8	river	UA_M6.9_0326	1	1	1	1	1
Azov region	Gruzky Elanchik	Sea of Azov	–	1,8	HMWB	UA_M6.9_0329	1	1	3	3	1
Azov region	Gruzky Elanchik	Sea of Azov	UA_R_16_M_1_Ca	6,6	river	UA_M6.9_0330	1	1	1	1	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Gruzky Elanchik	Sea of Azov	UA_R_16_M_1_Ca	46,8	river	UA_M6.9_0332	1	1	1	1	1
Azov region	Gruzky Elanchik	Sea of Azov	UA_R_16_L_1_Ca	1,6	river	UA_M6.9_0333	1	1	1	1	1
Azov region	Gruzky Elanchik	Sea of Azov	UA_R_16_L_1_Si	7,2	river	UA_M6.9_0334	1	1	1	1	1
Azov region	Kamenka	Gruzky Elanchik	UA_R_16_S_1_Ca	11,4	river	UA_M6.9_0335	1	1	1	1	1
Azov region	Kamenka	Gruzky Elanchik	–	2,2	HMWB	UA_M6.9_0336	1	1	3	3	1
Azov region	Kamenka	Gruzky Elanchik	UA_R_16_S_1_Ca	1,8	river	UA_M6.9_0337	1	1	1	1	1
Azov region	Kamenka	Gruzky Elanchik	UA_R_16_M_1_Ca	3,0	river	UA_M6.9_0339	1	1	1	1	1
Azov region	Stony	Gruzky Elanchik	UA_R_16_S_1_Si	12,5	river	UA_M6.9_0340	1	1	1	1	1
Azov region	Stony	Gruzky Elanchik	–	1,2	HMWB	UA_M6.9_0341	1	1	3	3	1
Azov region	Stony	Gruzky Elanchik	UA_R_16_S_1_Si	5,3	river	UA_M6.9_0342	1	1	1	1	1
Azov region	Stony	Gruzky Elanchik	UA_R_16_S_1_Ca	1,7	river	UA_M6.9_0343	1	1	1	1	1
Azov region	Slide	Gruzky Elanchik	UA_R_16_S_1_Ca	10,8	river	UA_M6.9_0344	1	1	1	1	1
Azov region	Slide	Gruzky Elanchik	UA_R_16_S_1_Ca	8,3	river	UA_M6.9_0346	1	1	1	1	1
Azov region	Slide	Gruzky Elanchik	–	1,3	HMWB	UA_M6.9_0347	1	1	3	3	1
Azov region	Slide	Gruzky Elanchik	UA_R_16_S_1_Ca	0,6	river	UA_M6.9_0348	1	1	1	1	1
Azov region	Slide	Gruzky Elanchik	UA_R_16_M_1_Ca	5,5	river	UA_M6.9_0349	1	1	1	1	1
Azov region	Slide	Gruzky Elanchik	–	3,4	HMWB	UA_M6.9_0350	1	1	3	3	1
Azov region	Slide	Gruzky Elanchik	UA_R_16_M_1_Ca	1,7	river	UA_M6.9_0351	1	1	1	1	1
Azov region	Khartsyzsk	Gruzky Elanchik	UA_R_16_S_1_Si	14,8	river	UA_M6.9_0352	3	1	1	3	2
Azov region	Khartsyzsk	Gruzky Elanchik	UA_R_16_M_1_Si	18,5	river	UA_M6.9_0353	1	1	1	1	1
Azov region	Khartsyzsk	Gruzky Elanchik	UA_R_16_M_1_Ca	4,8	river	UA_M6.9_0354	1	1	1	1	1
Azov region	Wet Elanchik	Sea of Azov	UA_R_16_S_1_Si	9,4	river	UA_M6.9_0355	3	1	1	3	2
Azov region	Wet Elanchik	Sea of Azov	UA_R_16_S_1_Si	1,6	river	UA_M6.9_0357	1	1	1	1	1
Azov region	Wet Elanchik	Sea of Azov	UA_R_16_M_1_Si	8,3	river	UA_M6.9_0358	1	1	1	1	1
Azov region	Dry Elanchik	Wet Elanchik	UA_R_16_S_1_Si	7,2	river	UA_M6.9_0359	1	1	1	1	1
Azov region	Dry Elanchik	Wet Elanchik	–	1,6	HMWB	UA_M6.9_0360	1	1	3	3	1
Azov region	Dry Elanchik	Wet Elanchik	UA_R_16_S_1_Si	3,6	river	UA_M6.9_0361	1	1	1	1	1
Azov region	Dry Elanchik	Wet Elanchik	UA_R_16_S_1_Ca	1,4	river	UA_M6.9_0363	1	1	1	1	1
Azov region	Dry Elanchik	Wet Elanchik	UA_R_16_M_1_Ca	1,5	river	UA_M6.9_0364	1	1	1	1	1
Azov region	Dry Elanchik	Wet Elanchik	UA_R_16_M_1_Ca	4,9	river	UA_M6.9_0366	1	1	1	1	1
Azov region	Mius	Sea of Azov	UA_R_16_S_2_Ca	5,3	river	UA_M6.9_0367	1	1	1	1	1
Azov region	Mius	Sea of Azov	UA_R_16_S_1_Ca	9,1	river	UA_M6.9_0368	1	1	1	1	1
Azov region	Mius	Sea of Azov	UA_R_16_M_1_Ca	5,9	river	UA_M6.9_0369	1	1	1	1	1
Azov region	Mius	Sea of Azov	UA_R_16_M_1_Ca	15,0	river	UA_M6.9_0371	3	1	1	3	2

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Mius	Sea of Azov	UA_R_16_M_1_Ca	22,2	river	UA_M6.9_0373	3	1	1	3	2
Azov region	Mius	Sea of Azov	UA_R_16_L_1_Ca	26,1	river	UA_M6.9_0374	1	1	1	1	1
Azov region	Miusik	Mius	UA_R_16_S_2_Ca	4,1	river	UA_M6.9_0375	1	1	1	1	1
Azov region	Miusik	Mius	UA_R_16_S_1_Ca	8,3	river	UA_M6.9_0376	1	1	1	1	1
Azov region	Miusik	Mius	UA_R_16_M_1_Ca	5,0	river	UA_M6.9_0377	3	1	1	3	2
Azov region	Miusik	Mius	UA_R_16_M_1_Ca	2,5	river	UA_M6.9_0379	1	1	1	1	1
Azov region	Grooves	Mius	UA_R_16_S_2_Ca	6,9	river	UA_M6.9_0380	3	1	1	3	2
Azov region	Grooves	Mius	UA_R_16_S_1_Ca	10,3	river	UA_M6.9_0381	3	1	1	3	2
Azov region	Deaf	Mius	UA_R_16_S_2_Ca	4,4	river	UA_M6.9_0382	1	1	1	1	1
Azov region	Deaf	Mius	UA_R_16_S_1_Ca	17,0	river	UA_M6.9_0383	3	1	1	3	2
Azov region	Deaf	Mius	UA_R_16_M_1_Ca	7,5	river	UA_M6.9_0384	1	1	1	1	1
Azov region	Kripenka	Mius	UA_R_16_S_2_Ca	5,8	river	UA_M6.9_0385	1	1	1	1	1
Azov region	Kripenka	Mius	UA_R_16_S_1_Ca	6,3	river	UA_M6.9_0386	1	1	1	1	1
Azov region	Kripenka	Mius	UA_R_16_M_1_Ca	25,6	river	UA_M6.9_0387	3	1	1	3	2
Azov region	Gerasimova	Mius	UA_R_16_S_2_Ca	0,8	river	UA_M6.9_0388	1	1	1	1	1
Azov region	Gerasimova	Mius	UA_R_16_S_1_Ca	17,3	river	UA_M6.9_0389	1	1	1	1	1
Azov region	Naked	Mius	UA_R_16_S_2_Ca	3,9	river	UA_M6.9_0390	3	1	1	3	2
Azov region	Naked	Mius	UA_R_16_S_1_Ca	2,3	river	UA_M6.9_0391	1	1	1	1	1
Azov region	Naked	Mius	–	1,1	HMWB	UA_M6.9_0392	1	1	3	3	1
Azov region	Naked	Mius	UA_R_16_S_1_Ca	8,1	river	UA_M6.9_0393	1	1	1	1	1
Azov region	Naked	Mius	UA_R_16_M_1_Ca	13,5	river	UA_M6.9_0394	1	1	1	1	1
Azov region	Naked	Mius	UA_R_16_M_1_Ca	39,3	river	UA_M6.9_0396	3	1	1	3	2
Azov region	Gruzka	Naked	UA_R_16_S_2_Ca	0,3	river	UA_M6.9_0397	1	1	1	1	1
Azov region	Gruzka	Naked	UA_R_16_S_1_Ca	9,9	river	UA_M6.9_0398	1	1	1	1	1
Azov region	Gruzka	Naked	UA_R_16_S_1_Ca	2,6	river	UA_M6.9_0400	1	1	1	1	1
Azov region	Rovenok	Naked	UA_R_16_S_2_Ca	6,1	river	UA_M6.9_0401	3	1	1	3	2
Azov region	Rovenok	Naked	UA_R_16_S_1_Ca	10,0	river	UA_M6.9_0402	1	1	1	1	1
Azov region	Rovenok	Naked	UA_R_16_M_1_Ca	6,3	river	UA_M6.9_0403	1	1	1	1	1
Azov region	Dear	Rovenok	UA_R_16_S_2_Ca	3,5	river	UA_M6.9_0405	1	1	1	1	1
Azov region	Dear	Rovenok	UA_R_16_S_2_Ca	0,5	river	UA_M6.9_0407	1	1	1	1	1
Azov region	Dear	Rovenok	UA_R_16_S_1_Ca	11,2	river	UA_M6.9_0408	1	1	1	1	1
Azov region	Mobile	Naked	UA_R_16_S_1_Ca	12,2	river	UA_M6.9_0409	1	1	1	1	1
Azov region	Vyshnevetska	Naked	UA_R_16_S_2_Ca	5,4	river	UA_M6.9_0410	3	1	1	3	2
Azov region	Vyshnevetska	Naked	UA_R_16_S_1_Ca	11,2	river	UA_M6.9_0411	3	1	1	3	2

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Vyshnevetska	Naked	UA_R_16_M_1_Ca	5,4	river	UA_M6.9_0412	1	1	1	1	1
Azov region	Vyshnevetska	Naked	UA_R_16_M_1_Ca	6,6	river	UA_M6.9_0414	1	1	1	1	1
Azov region	Yuskin	Vyshnevetska	UA_R_16_S_2_Ca	3,2	river	UA_M6.9_0415	1	1	1	1	1
Azov region	Yuskin	Vyshnevetska	UA_R_16_S_1_Ca	1,2	river	UA_M6.9_0416	1	1	1	1	1
Azov region	Yuskin	Vyshnevetska	UA_R_16_S_1_Ca	12,1	river	UA_M6.9_0418	3	1	1	3	2
Azov region	Orikhova	Vyshnevetska	UA_R_16_S_2_Ca	2,6	river	UA_M6.9_0419	1	1	1	1	1
Azov region	Orikhova	Vyshnevetska	UA_R_16_S_1_Ca	16,0	river	UA_M6.9_0420	1	1	1	1	1
Azov region	Headband	Naked	UA_R_16_S_2_Ca	6,7	river	UA_M6.9_0421	1	1	1	1	1
Azov region	Headband	Naked	UA_R_16_S_1_Ca	10,1	river	UA_M6.9_0422	3	1	1	3	2
Azov region	Headband	Naked	UA_R_16_S_1_Ca	6,6	river	UA_M6.9_0424	1	1	1	1	1
Azov region	Headband	Naked	–	7,2	HMWB	UA_M6.9_0425	1	1	3	3	1
Azov region	Dubrovka	Mius	UA_R_16_S_1_Ca	5,9	river	UA_M6.9_0426	1	1	1	1	1
Azov region	Dubrovka	Mius	–	1,7	HMWB	UA_M6.9_0427	1	1	3	3	1
Azov region	Dubrovka	Mius	UA_R_16_S_1_Ca	5,2	river	UA_M6.9_0428	1	1	1	1	1
Azov region	Dubrovka	Mius	–	1,1	HMWB	UA_M6.9_0429	1	1	3	3	1
Azov region	Dubrovka	Mius	UA_R_16_S_1_Ca	2,9	river	UA_M6.9_0430	1	1	1	1	1
Azov region	Olkhovchik	Mius	UA_R_16_S_2_Ca	3,2	river	UA_M6.9_0431	1	1	1	1	1
Azov region	Olkhovchik	Mius	UA_R_16_S_1_Ca	22,3	river	UA_M6.9_0432	1	1	1	1	1
Azov region	Krinka	Mius	UA_R_16_M_1_Ca	17,2	river	UA_M6.9_0434	1	1	1	1	1
Azov region	Krinka	Mius	UA_R_16_M_1_Ca	3,8	river	UA_M6.9_0436	1	1	1	1	1
Azov region	Krinka	Mius	UA_R_16_L_1_Ca	8,7	river	UA_M6.9_0437	1	1	1	1	1
Azov region	Krinka	Mius	UA_R_16_L_1_Ca	137,1	river	UA_M6.9_0439	3	1	1	3	2
Azov region	Bulavin	Krinka	UA_R_16_S_2_Ca	10,3	river	UA_M6.9_0440	3	1	1	3	2
Azov region	Bulavin	Krinka	UA_R_16_S_1_Ca	3,4	river	UA_M6.9_0441	1	1	1	1	1
Azov region	Bulavin	Krinka	UA_R_16_M_1_Ca	12,1	river	UA_M6.9_0442	1	1	1	1	1
Azov region	Bulavin	Krinka	UA_R_16_M_1_Ca	2,7	river	UA_M6.9_0444	1	1	1	1	1
Azov region	Bulavin	Krinka	–	1,4	HMWB	UA_M6.9_0445	1	1	3	3	1
Azov region	Bulavin	Krinka	UA_R_16_M_1_Ca	9,3	river	UA_M6.9_0446	3	1	1	3	2
Azov region	Olkhovatka	Bulavin	UA_R_16_S_2_Ca	0,6	river	UA_M6.9_0447	1	1	1	1	1
Azov region	Olkhovatka	Bulavin	–	1,1	HMWB	UA_M6.9_0448	1	1	3	3	1
Azov region	Olkhovatka	Bulavin	UA_R_16_S_2_Ca	6,0	river	UA_M6.9_0449	1	1	1	1	1
Azov region	Olkhovatka	Bulavin	UA_R_16_S_1_Ca	5,6	river	UA_M6.9_0450	3	1	1	3	2
Azov region	Gardens	Krinka	UA_R_16_S_2_Ca	3,2	river	UA_M6.9_0451	3	1	1	3	2
Azov region	Gardens	Krinka	UA_R_16_S_1_Ca	7,9	river	UA_M6.9_0452	1	1	1	1	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Gardens	Krinka	UA_R_16_S_1_Ca	4,9	river	UA_M6.9_0454	1	1	1	1	1
Azov region	Korsun	Krinka	UA_R_16_S_2_Ca	6,0	river	UA_M6.9_0455	1	1	1	1	1
Azov region	Korsun	Krinka	UA_R_16_S_1_Ca	2,5	river	UA_M6.9_0456	1	2	1	2	1
Azov region	Korsun	Krinka	–	1,7	HMWB	UA_M6.9_0457	1	2	3	3	1
Azov region	Korsun	Krinka	UA_R_16_S_1_Ca	1,4	river	UA_M6.9_0458	1	1	1	1	1
Azov region	Korsun	Krinka	–	1,2	HMWB	UA_M6.9_0459	1	1	3	3	1
Azov region	Korsun	Krinka	UA_R_16_S_1_Ca	8,1	river	UA_M6.9_0460	1	1	1	1	1
Azov region	Korsun	Krinka	UA_R_16_M_1_Ca	5,7	river	UA_M6.9_0461	1	1	1	1	1
Azov region	Dewlap	Korsun	UA_R_16_S_2_Ca	3,6	river	UA_M6.9_0462	1	2	1	2	1
Azov region	Dewlap	Korsun	UA_R_16_S_1_Ca	2,4	river	UA_M6.9_0463	1	1	1	1	1
Azov region	Dewlap	Korsun	–	2,4	HMWB	UA_M6.9_0464	1	1	3	3	1
Azov region	Dewlap	Korsun	UA_R_16_S_1_Ca	5,0	river	UA_M6.9_0465	1	1	1	1	1
Azov region	Alder	Krinka	UA_R_16_S_2_Ca	2,6	river	UA_M6.9_0466	1	3	1	3	1
Azov region	Alder	Krinka	–	1,1	HMWB	UA_M6.9_0467	3	3	3	3	2
Azov region	Alder	Krinka	UA_R_16_S_1_Ca	8,2	river	UA_M6.9_0468	1	1	1	1	1
Azov region	Alder	Krinka	–	1,3	HMWB	UA_M6.9_0469	3	1	3	3	2
Azov region	Alder	Krinka	UA_R_16_M_1_Ca	11,6	river	UA_M6.9_0470	1	1	1	1	1
Azov region	Alder	Krinka	UA_R_16_M_1_Ca	3,3	river	UA_M6.9_0472	3	1	1	3	2
Azov region	Khartsyzsk	Alder	UA_R_16_S_2_Ca	4,8	river	UA_M6.9_0473	1	1	1	1	1
Azov region	Khartsyzsk	Alder	–	1,3	HMWB	UA_M6.9_0474	1	1	3	3	1
Azov region	Khartsyzsk	Alder	UA_R_16_S_1_Ca	8,7	river	UA_M6.9_0475	1	1	1	1	1
Azov region	Khartsyzsk	Alder	–	1,4	HMWB	UA_M6.9_0476	1	1	3	3	1
Azov region	Khartsyzsk	Alder	UA_R_16_M_1_Ca	5,3	river	UA_M6.9_0477	3	1	1	3	2
Azov region	Klinova	Khartsyzsk	UA_R_16_S_2_Ca	5,3	river	UA_M6.9_0478	1	1	1	1	1
Azov region	Klinova	Khartsyzsk	UA_R_16_S_1_Ca	8,5	river	UA_M6.9_0479	1	1	1	1	1
Azov region	Olkhovka	Alder	–	2,7	HMWB	UA_M6.9_0480	1	1	3	3	1
Azov region	Olkhovka	Alder	UA_R_16_S_1_Ca	9,0	river	UA_M6.9_0481	1	1	1	1	1
Azov region	Olkhovka	Alder	–	2,0	HMWB	UA_M6.9_0482	1	1	3	3	1
Azov region	Olkhovka	Alder	UA_R_16_S_1_Ca	2,2	river	UA_M6.9_0483	1	1	1	1	1
Azov region	Bolshaya Sklyovaya	Krinka	–	2,5	HMWB	UA_M6.9_0484	1	1	3	3	1
Azov region	Bolshaya Sklyovaya	Krinka	UA_R_16_S_1_Ca	11,7	river	UA_M6.9_0485	1	1	1	1	1
Azov region	Orlovka	Krinka	UA_R_16_S_2_Ca	1,3	river	UA_M6.9_0486	3	1	1	3	2

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB CODE	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Azov region	Orlovka	Krinka	UA_R_16_S_1_Ca	21,6	river	UA_M6.9_0487	1	1	1	1	1
Azov region	Shishova	Krinka	UA_R_16_S_1_Ca	11,4	river	UA_M6.9_0488	1	1	1	1	1
Azov region	Bolshaya Shishova	Krinka	UA_R_16_S_2_Ca	0,6	river	UA_M6.9_0489	1	1	1	1	1
Azov region	Bolshaya Shishova	Krinka	UA_R_16_S_1_Ca	15,8	river	UA_M6.9_0490	1	1	1	1	1
Azov region	Sevastianivka	Krinka	UA_R_16_S_2_Ca	0,4	river	UA_M6.9_0491	1	3	1	3	1
Azov region	Sevastianivka	Krinka	UA_R_16_S_1_Ca	8,0	river	UA_M6.9_0492	3	1	1	3	2
Azov region	Sevastianivka	Krinka	UA_R_16_S_1_Ca	1,2	river	UA_M6.9_0494	1	1	1	1	1
Azov region	Sevastianivka	Krinka	UA_R_16_M_1_Ca	16,7	river	UA_M6.9_0495	1	1	1	1	1
Azov region	Orlova	Sevastianivka	UA_R_16_S_2_Ca	4,0	river	UA_M6.9_0496	1	1	1	1	1
Azov region	Orlova	Sevastianivka	UA_R_16_S_1_Ca	7,2	river	UA_M6.9_0497	1	3	1	3	1
Azov region	Orikhova	Sevastianivka	UA_R_16_S_2_Ca	4,2	river	UA_M6.9_0498	1	1	1	1	1
Azov region	Orikhova	Sevastianivka	UA_R_16_S_1_Ca	12,3	river	UA_M6.9_0499	3	1	1	3	2
Azov region	Komyshuvakha	Krinka	UA_R_16_S_1_Ca	6,1	river	UA_M6.9_0500	1	1	1	1	1
Azov region	Komyshuvakha	Krinka	UA_R_16_S_1_Ca	4,9	river	UA_M6.9_0503	1	1	1	1	1
Azov region	Kalinova I	Krinka	UA_R_16_S_1_Ca	2,5	river	UA_M6.9_0504	1	1	1	1	1
Azov region	Kalinova I	Krinka	–	1,1	HMWB	UA_M6.9_0505	1	1	3	3	1
Azov region	Kalinova I	Krinka	UA_R_16_S_1_Ca	10,2	river	UA_M6.9_0506	1	1	1	1	1
Azov region	Kalinova II	Krinka	–	6,6	HMWB	UA_M6.9_0507	1	1	3	3	1
Azov region	Kalinova II	Krinka	–	1,1	HMWB	UA_M6.9_0508	1	1	3	3	1
Azov region	Kalinova II	Krinka	UA_R_16_S_1_Ca	6,0	river	UA_M6.9_0509	1	1	1	1	1
Azov region	Kalinova II	Krinka	UA_R_16_S_1_Ca	5,1	river	UA_M6.9_0510	1	1	1	1	1
Azov region	Kakhovka Canal		–	81,3	AWB	UA_M6.9_0511	1	1	1	1	1
Azov region	P-2 channel		–	69,7	AWB	UA_M6.9_0512	1	1	1	1	2
Azov region	P-5 channel		–	55,3	AWB	UA_M6.9_0513	1	1	1	1	1
Azov region	P-5-1 channel		–	78,5	AWB	UA_M6.9_0514	1	1	1	1	1
Azov region	P-9 channel		–	69,3	HMWB	UA_M6.9_0515	1	2	1	2	1

Polygonal SWBs

River basin	River sub-basin	Name of the SWB	Type of SWBs	Area, km2	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										Good ecological status/potential	good chemical status
Azov region	–	Chernihiv reservoir	–	0,62	HMWB	UA_M6.9_0034	1	1	3	3	1
Azov region	–	Kainkulatske reservoir	–	1,02	HMWB	UA_M6.9_0036	1	1	3	3	1
Azov region	–	Novokazankuvate reservoir	–	0,238	HMWB	UA_M6.9_0044	1	1	3	3	1
Azov region	–	Chingul reservoir	–	0,9	HMWB	UA_M6.9_0050	1	1	3	3	1
Azov region	–	Yushanlinskoye reservoir	–	0,464	HMWB	UA_M6.9_0064	1	1	3	3	1
Azov region	–	Lagidnenskoye (Kirovskoye) reservoir	–	0,87	HMWB	UA_M6.9_0066	1	1	3	3	1
Azov region	–	Kolarivske Reservoir	–	0,3658	HMWB	UA_M6.9_0099	1	1	3	3	1
Azov region	–	Andriyivske Reservoir	–	0,9	HMWB	UA_M6.9_0108	1	1	3	3	1
Azov region	–	Sofiyivske (Zhovtnevske) reservoir	–	0,32	HMWB	UA_M6.9_0128	1	1	3	3	1
Azov region	–	Burtchechyky Reservoir	–	0,4	HMWB	UA_M6.9_0131	1	1	3	3	1
Azov region	–	Berdiansk reservoir	–	2,556	HMWB	UA_M6.9_0140	1	1	3	3	1
Azov region	–	Alekseevskoye Reservoir	–	0,21	HMWB	UA_M6.9_0144	1	1	3	3	1
Azov region	–	Eastern reservoir	–	0,23	HMWB	UA_M6.9_0152	1	1	3	3	1
Azov region	–	Bila Tserkva Reservoir	–	0,316	HMWB	UA_M6.9_0154	1	1	3	3	1
Azov region	–	Garden pond	–	0,2395	HMWB	UA_M6.9_0156	1	1	3	3	1
Azov region	–	Zakharievske Reservoir	–	0,56	HMWB	UA_M6.9_0158	1	1	3	3	1
Azov region	–	Rozovka reservoir	–	0,46	HMWB	UA_M6.9_0167	1	1	3	3	1
Azov region	–	Fedorivske Reservoir	–	0,46	HMWB	UA_M6.9_0172	1	1	3	3	1
Azov region	–	Starodubivske Reservoir	–	0,6219	HMWB	UA_M6.9_0174	1	1	3	3	1
Azov region	–	Romanivske reservoir	–	0,336	HMWB	UA_M6.9_0182	1	1	3	3	1
Azov region	–	Primorskoye Reservoir	–	0,76	HMWB	UA_M6.9_0190	1	1	3	3	1
Azov region	–	V. Kalmius reservoir	–	1,25	HMWB	UA_M6.9_0204	1	1	3	3	1
Azov region	–	Nizhnekalmiuskoye reservoir	–	1,043	HMWB	UA_M6.9_0207	1	1	3	3	1
Azov region	–	Starobeshevo reservoir	–	7,14538	HMWB	UA_M6.9_0210	1	1	3	3	1
Azov region	–	Pavlopilsk reservoir	–	8,1	HMWB	UA_M6.9_0212	1	1	3	3	1
Azov region	–	Donetsk reservoir	–	1,2	HMWB	UA_M6.9_0215	1	1	3	3	1
Azov region	–	BAM reservoir	–	0,4	HMWB	UA_M6.9_0230	1	1	3	3	1
Azov region	–	Oleksandrivske Reservoir	–	1,17	HMWB	UA_M6.9_0235	1	1	3	3	1
Azov region	–	Mykolaiv reservoir	–	2,8	HMWB	UA_M6.9_0246	1	1	3	3	1
Azov region	–	Stilske reservoir	–	2,1886	HMWB	UA_M6.9_0248	1	1	3	3	1

River basin	River sub-basin	Name of the SWB	Type of SWBs	Area, km2	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										Good ecological status/potential	good chemical status
Azov region	–	Olenivske Reservoir	–	0,454	HMWB	UA_M6.9_0256	1	1	3	3	1
Azov region	–	Dokuchaevskoye reservoir	–	0,42	HMWB	UA_M6.9_0258	1	1	3	3	1
Azov region	–	Kamyshevakhskoye reservoir	–	1,04	HMWB	UA_M6.9_0264	1	1	3	3	1
Azov region	–	Staroignativske reservoir	–	0,62	HMWB	UA_M6.9_0268	1	1	3	3	1
Azov region	–	Kamianske Reservoir	–	0,3	HMWB	UA_M6.9_0272	1	1	3	3	1
Azov region	–	Granite reservoir	–	0,214	HMWB	UA_M6.9_0275	1	1	3	3	1
Azov region	–	Staro-Krymske Reservoir	–	4,877	HMWB	UA_M6.9_0289	1	1	3	3	1
Azov region	–	Znamenskoye reservoir	–	0,45	HMWB	UA_M6.9_0294	1	1	3	3	1
Azov region	–	Donskoy reservoir	–	0,576	HMWB	UA_M6.9_0303	1	1	3	3	1
Azov region	–	Anadolsk reservoir	–	0,56	HMWB	UA_M6.9_0305	1	1	3	3	1
Azov region	–	Kirovskoye reservoir	–	0,55	HMWB	UA_M6.9_0308	1	1	3	3	1
Azov region	–	The victorious reservoir	–	0,6	HMWB	UA_M6.9_0314	1	1	3	3	1
Azov region	–	Kumachevskoye reservoir	–	0,4765	HMWB	UA_M6.9_0323	1	1	3	3	1
Azov region	–	Shevchenkivske III reservoir	–	0,17	HMWB	UA_M6.9_0327	1	1	3	3	1
Azov region	–	Shevchenkivske II reservoir	–	0,835	HMWB	UA_M6.9_0328	1	1	3	3	1
Azov region	–	Mikhailovskoye I reservoir	–	0,45	HMWB	UA_M6.9_0331	1	1	3	3	1
Azov region	–	Mikhailovsky reservoir	–	0,9	HMWB	UA_M6.9_0338	1	1	3	3	1
Azov region	–	Kisilovskoye reservoir	–	0,27	HMWB	UA_M6.9_0356	1	1	3	3	1
Azov region	–	Novoivanivske reservoir	–	0,46	HMWB	UA_M6.9_0362	1	1	3	3	1
Azov region	–	Ulyanovsk reservoir	–	0,577	HMWB	UA_M6.9_0365	1	1	3	3	1
Azov region	–	Grabivske Reservoir	–	1,44	HMWB	UA_M6.9_0370	1	1	3	3	1
Azov region	–	Shterivske Reservoir	–	3,51	HMWB	UA_M6.9_0372	1	1	3	3	1
Azov region	–	Yanivske Reservoir	–	0,7556	HMWB	UA_M6.9_0378	1	1	3	3	1
Azov region	–	Platonivske Reservoir	–	0,69	HMWB	UA_M6.9_0395	1	1	3	3	1
Azov region	–	Blagovske Reservoir	–	0,5	HMWB	UA_M6.9_0399	1	1	3	3	1
Azov region	–	Rovenky reservoir	–	1,06	HMWB	UA_M6.9_0404	1	1	3	3	1
Azov region	–	Verbovske Reservoir	–	0,118	HMWB	UA_M6.9_0406	1	1	3	3	1
Azov region	–	Nagolchanskoye reservoir	–	0,6	HMWB	UA_M6.9_0413	1	1	3	3	1
Azov region	–	Kosharske reservoir	–	0,143	HMWB	UA_M6.9_0417	1	1	3	3	1
Azov region	–	Anthracite reservoir	–	0,243	HMWB	UA_M6.9_0423	1	1	3	3	1
Azov region	–	Khanzhenkivske reservoir	–	7,5	HMWB	UA_M6.9_0435	1	1	3	3	1
Azov region	–	Zuevskoye reservoir	–	1,77	HMWB	UA_M6.9_0438	1	1	3	3	1
Azov region	–	Volynets Reservoir	–	2,64	HMWB	UA_M6.9_0443	1	1	3	3	1
Azov region	–	Yenakiieve reservoir	–	0,63	HMWB	UA_M6.9_0453	1	1	3	3	1

River basin	River sub-basin	Name of the SWB	Type of SWBs	Area, km2	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										Good ecological status/potential	good chemical status
Azov region	–	Olkhovskoye reservoir	–	3,72	HMWB	UA_M6.9_0471	1	1	3	3	1
Azov region	–	Manuylivske I reservoir	–	0,226	HMWB	UA_M6.9_0493	1	1	3	3	1
Azov region	–	Semenivske II reservoir	–	0,239	HMWB	UA_M6.9_0501	1	1	3	3	1
Azov region	–	Semenivske I reservoir	–	0,188755	HMWB	UA_M6.9_0502	1	1	3	3	1
Azov region	–	Lake. Lake Overianivske	UA_L_12_S_1_SH_Si	0,926	lake	UA_M6.9_0516	1	1	3	3	1
Azov region	–	Lake. Zyablovske Lake	UA_L_12_M_1_SH_Si	1,3	lake	UA_M6.9_0517	1	1	3	3	1
Azov region	–	Bulk storage reservoir	–	2,45	A	UA_M6.9_0518	1	1	3	3	1
Azov region	–	Lake. Bakai Lake	–	1,716	AWB	UA_M6.9_0519	1	1	3	3	1
Azov region	–	Bulk storage reservoir	–	4,528	AWB	UA_M6.9_0520	1	1	3	3	1
Azov region	–	Bulk storage reservoir	–	2,41	AWB	UA_M6.9_0521	1	1	3	3	1
Azov region	–	Bulk storage reservoir	–	0,53	AWB	UA_M6.9_0522	1	1	3	3	1
Azov region	–	Bulk storage reservoir	–	9,56	AWB	UA_M6.9_0523	1	1	3	3	1
Azov region	–	Bulk storage reservoir	–	3,061	AWB	UA_M6.9_0524	1	1	3	3	1
Azov region	–	Bulk storage reservoir	–	2,78	AWB	UA_M6.9_0525	1	1	3	3	1
Azov region	–	Bulk storage reservoir	–	1,06	AWB	UA_M6.9_0526	1	1	3	3	1
Azov region	–	Tank for salt production	–	1,47	AWB	UA_M6.9_0527	1	1	3	3	1
Azov region	–	Sump	–	1,705	AWB	UA_M6.9_0528	1	1	3	3	1
Azov region	–	Kryvokiska estuary	UA_L_16_M_1_SH_Si	1,74	lake	UA_M6.9_0529	1	1	3	3	1
Azov region	–	Lake. Dovhe	UA_L_12_M_1_SH_Si	1,54	lake	UA_M6.9_0530	1	1	3	3	1
Azov region	–	Lake. Dovhe	UA_L_12_M_1_SH_Si	1,249	lake	UA_M6.9_0531	1	1	3	3	1
Azov region	–	An estuary with no name	UA_L_12_M_1_SH_Si	1,05	lake	UA_M6.9_0532	1	1	3	3	1
Azov region	–	Great estuary	UA_L_12_M_1_SH_Si	3,65	lake	UA_M6.9_0533	1	1	3	3	1
Azov region	–	Bolgrad Sivashik estuary	UA_L_12_L_1_SH_Si	12,8	lake	UA_M6.9_0534	1	1	3	3	1
Azov region	–	Lake. Liman	UA_L_12_M_1_SH_Si	2,9753	lake	UA_M6.9_0535	1	1	3	3	1
Azov region	–	Lake. Sokolovskoye Lake	UA_L_12_M_1_SH_Si	3,3449	lake	UA_M6.9_0536	1	1	3	3	1
Azov region	–	Lake. Lake Kruglyak	UA_L_12_M_1_SH_Si	2,54	lake	UA_M6.9_0537	1	1	3	3	1
Azov region	–	Molochny estuary	UA_TW_M6_P_O	211,858	transitional waters	UA_M6.9_0538	1	1	3	3	1
Azov region	–	Utliutskyi estuary	UA_TW_M6_M_C	43,7	transitional waters	UA_M6.9_0539	3	1	3	3	2
Azov region	–	Sivash Bay	UA_TW_M6_E_C	310,7	transitional waters	UA_M6.9_0540	1	1	3	3	1

River basin	River sub-basin	Name of the SWB	Type of SWBs	Area, km2	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										Good ecological status/potential	good chemical status
Azov region	–	Stare Lake	UA_TW_M6_P_C	11,83	transitional waters	UA_M6.9_0541	1	1	3	3	1
Azov region	–	Lake Krasne	UA_TW_M6_P_C	24,055	transitional waters	UA_M6.9_0542	1	1	3	3	1
Azov region	–	Lake Kyatske	UA_TW_M6_P_C	17,49	transitional waters	UA_M6.9_0543	1	1	3	3	1
Azov region	–	Lake Kirleutskoye	UA_TW_M6_P_C	20,48	transitional waters	UA_M6.9_0544	1	1	3	3	1
Azov region	–	Lake. Lake Aigulskoye	UA_TW_M6_H_C	29,5	transitional waters	UA_M6.9_0545	1	1	3	3	1
Azov region	–	Sivash Bay	UA_TW_M6_E_C	378,65	transitional waters	UA_M6.9_0546	1	1	3	3	1
Azov region	–	Sivash Bay	UA_TW_M6_E_O	1481,2	transitional waters	UA_M6.9_0547	3	1	3	3	2
Azov region	–	Lake Genicheske	UA_TW_M6_E_C	8,34	transitional waters	UA_M6.9_0548	1	1	3	3	1
Azov region	–	Lake. Lake Tobechytske	UA_TW_M6_E_C	18,29608	transitional waters	UA_M6.9_0549	1	1	3	3	1
Azov region	–	Azov	UA_CW_M6_M_SH_S_SS	23,7	coastal waters	UA_M6.9_0550	1	1	1	1	1
Azov region	–	Azov	UA_CW_M6_M_EX_S_SS	787,9	coastal waters	UA_M6.9_0551	3	1	1	3	2
Azov region	–	Azov	UA_CW_M6_M_EX_S_SS	492,755	coastal waters	UA_M6.9_0552	3	1	1	3	2
Azov region	–	Azov	UA_CW_M6_M_EX_S_CS	817,48	coastal waters	UA_M6.9_0553	3	1	1	3	2
Azov region	–	Azov	UA_CW_M6_M_EX_S_SS	1751,5	coastal waters	UA_M6.9_0554	3	1	1	3	2
Azov region	–	Azov	UA_CW_M6_M_EX_S_SS	672,5	coastal waters	UA_M6.9_0555	3	1	1	3	2
Azov region	–	Azov	UA_CW_M6_M_SH_S_CS	140,07	coastal waters	UA_M6.9_0556	1	1	1	1	1
Azov region	–	Azov	UA_CW_M6_M_EX_S_CS	692,33	coastal waters	UA_M6.9_0557	1	1	1	1	1

Annex 1 Characteristics of the identified GWBs and groups of GWBs in the Vistula RBD

Table 1: Characteristics of the group of GWB in alluvial quaternary sediments

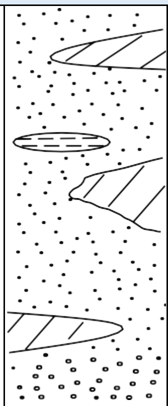
Parameters.	Characteristics	Lithological and hydrogeological column
Combined code of the GWB group	UAM6900Q100	aH, aP  Kf 0.01 m/d (dredged sands), 6-15 m/d (sands of the northeast), 0.2-0.4 m/d (sandy loam, up to 40 m/d 50-60 м; SO_4 , Na-Ca-Mg, M 1-3 g/dm^3 , Fe up to 2-3 mg/dm^3
Group code of the GWB	UAM6900Q100	
Name of the GWB	Group of GWB in alluvial quaternary sediments	
The area of the GWB group		
Geological index	aH, aP	
Lithology of water-bearing rocks	Sands of different grains	
Type of aquifer: unconfined or artesian	Non-pressure	
Overlapping rocks	-	
Capacity of the MPzV group, min-max/average, m	1-30 8-10	
Filtration coefficient, k min.-max./average, m/day	0,01-49 6-15	
Water supply, km, min.-max./average, m /day^2	0,12-60 1-5	
PV level, min-max/average, m	2-15 5-10	
Average annual fluctuations in the level of PV, m	0,5-1,5	
Use for water withdrawal >10 m^3 /day: yes/no	No.	
Number of captive sources	-	
Number of operational units.	N.v.	
Chemical composition (mineralisation, major anions, cations)	Mineralisation 1.0-3.0 g/dm^3 , SO_4 Na, Ca, Mg Cl, HCO_3	
Main power supply	Infiltration of precipitation, surface water, and aquifer flow, that lie below	
Relationship to surface water	Yes	
RPV trend	Levels are stable	
The predominant human activity	For the economic and domestic needs of the rural population	
Chemical status of the GWB group	Good, local nitrate pollution	
Quantitative status of the GWB group	Good	
Reliability of information	High	
Annual precipitation, mm	430-1070	

Table 2: Characteristics of the group of GWB in marine and estuarine sediments

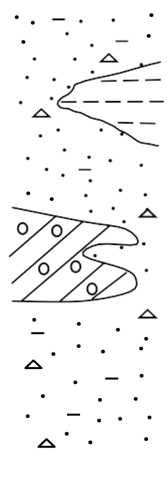
Parameters.	**Characteristics**	**Lithological and hydrogeological column**			
Combined code of the GWB group	UAM6900Q200	m, lm		Kf 0.2 0.4 m/d (loams), 6.6 m/d (sands), 31 43 m/d (c/w sands), 4-29 m/d (n/w sands), km 0.6-180 m /d²	Cl, -Cl-SO4 , Na- M 3.1-44.0 g/dm³ (prevails up to 4.4 g/dm)³
Group code of the GWB	UAM6900Q200				
Name of the GWB GWB group	The GWB Group in the maritime and estuarine and marine sediments				
The area of the GWB group	80,56				
Geological index	m,lm				
Lithology of water-bearing rocks	Sands of different grains with layers of sandy loam, loam				
Type of aquifer: non-pressure or artesian	non-pressure				
Overlapping rocks	-				
Power of the GWB, min. average, m	3-40 10-20				
Filtration coefficient, k min. max/average, m/day	0,01-10,2 1-3				
Water supply, km, min. max/average, m /day²					
PV level, min.-max. average, m	3-10 5				
Average annual fluctuations PV level, m	0,5-2,0 1,5				
Use for water withdrawal >10 m³ /day: yes/no	No.				
Number of captive sources	-				
Number of operational units.	N.v.				
Chemical composition (mineralisation, main anions, cations)	Mineralisation 3.1-44.0 gdm³, Cl, Cl-SO4 Na,Ca				
Main power supply	Infiltration precipitation, surface water, flowed from the horizons, that lie below				
Connection to the surface by the waters	Yes				
RPV trend	Levels are stable				
Predominant activity human	For household needs rural population				
Chemical status of the GWB group	Good, local nitrate pollution				
Quantitative status of the GWB group	Good				
Reliability of information	High				
Annual precipitation, mm	435-540				

Table 3: Characteristics of the group of GWB in aeolian-deluvial and lacustrine or estuarine Pleistocene sediments of closed depressions - pods (vd,l,lmP)$_{I-III}$

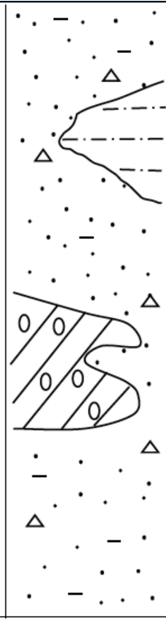
Parameters	Characteristics	Lithological and hydrogeological column
Combined GWB group code	UAM6900Q300	vd, l, lm  Кф 0,1-0,5 м/д (суглинки), 6,6 м/д (піски р/з), 11-23 м/д (піски к/з), 4-29 м/д (глини)с/з), km м^2/д Cl, -Cl-SO$_4$, Na- M 0,,1-8,0 г/дм^3 (переважає 1,0-3,0 г/дм^3)
GWB group code	UAM6900Q300	
Name of the GWB group	Group of GWB in aeolian-deluvial and lacustrine or estuarine Pleistocene sediments of closed depressions	
Area of the GWB group	80,56	
Geological index	vd,l,lmP$_{I-II}$	
Lithology of water-bearing rocks	silty loams with interlayers and lenses of sands and sandy loams, as well as clays, which alternate in the section	
Type of aquifer: unconfined or artesian	without pressure	
Overlapping rocks	aeration zone is represented by the same sediments	
Capacity of the GWB, min-max/average, m	from 4-6 to 10-12 m	
Filtration coefficient, k min.-max./average, m/day	0.1-0.5 in some places 5-8 m/day 1-3	
Water supply, km, min-max/average, m^2 /day		
Water table, min-max/average, m	1-1.5 m to 15-20 m	
Average annual fluctuations in water table, m	0,5-1,5 1,0	
Use for water withdrawal >10 m^3 /day: yes/no	No	
Number of captive sources	-	
Number of production wells	-	
Chemical composition (mineralisation, main anions, cations)	Mineralization is 0.8-1.0 g/dm3 to 15 g/dm³ Cl, Cl-SO4, HCO3, Na, Mg,	
Main power supply	Infiltration of atmospheric precipitation	
Relationship to surface water	Yes	
GWB trend	Levels are stable	
Prevailing human activity	For domestic needs of the rural population	
Chemical status of the GWB group	Good, local nitrate pollution	
Quantitative status of the GWB group	mostly unsatisfactory	
Reliability of information	low	
Annual precipitation, mm	435- 540	

Table 4. Characteristics of the group of GWB in aeolian-deluvial Quaternary sediments

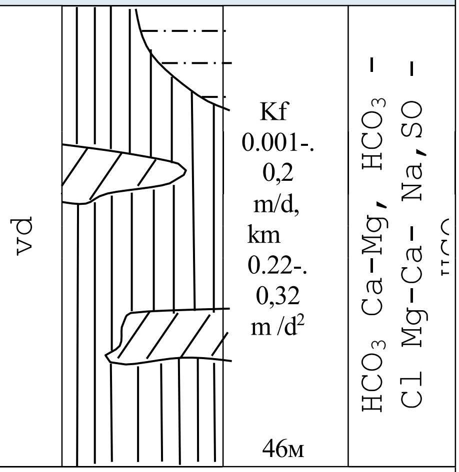
Parameters.	**Characteristics of the**	**Lithological and hydrogeological column**
Combined code of the GWB group	UAM6900Q400	
Group code of the GWB	UAM6900Q400	
Name of the GWB group	GWB in aeolian-deluvial Quaternary sediments	
Area of the GWB group		
Geological index	vdQ (vdPI-III, vdP$_{III}$ -H)	
Lithology of water-bearing rocks	Loams, sandy loams, loess loams Non-pressure	
Type of aquifer: unconfined or artesian Overlapping rocks Capacity	-	
of the MPzV group, min-	1-46	
max/average, m Filtration coefficient, k min-	10 0,001-0,2	
max/average, m/day Water supply, km, min-max/average, m^2 /day Water	0,01 0,22-0,32	
table, min-max/average, m Average annual fluctuations	0,26 2-15	
in water table, m Use for water withdrawal >10	5 0,5-1,5	
m^3 /day: yes/no Chemical composition	No.	
(mineralisation, major anions, cations)	Mineralisation 1.0-6.1 g/dm^3 ,	
Main power supply Number of capacitated sources Number of production wells Connection	SO_4 - Cl, SO_4 ,HCO3- SO_4 , Na, Mg -Ca-Na, Cl- SO_4 , Mg -Ca-Na, SO_4 - HCO_3 Ca Infiltration of precipitation	
to surface water GWB trend	- N.v.	
	Yes	
The predominant human		
activity Chemical status of the IPPC	Levels are subject to seasonal fluctuations	
group Quantitative status of the	For domestic needs of rural population Satisfactory, local	
GWB group Reliability of information	nitrate pollution Good	
Annual precipitation, mm	High 460-560	

Table 5. Characteristics of the group of GWB in Pliocene terrigenous sediments

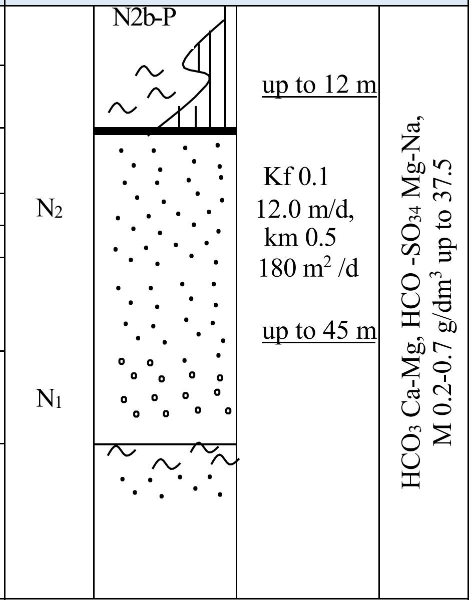
Parameters.	**Characteristics**	**Lithological and hydrogeological column**
Unified code of the GWB	UAM6900N200	
GWB code	UAM6900N200	
Name of the GWB	GWB in terrigenous sediments Pliocene	
Area of the GWB, km2	661,2	
Geological index	aN_{2}- E, N2ak, N2km	
Lithology of water-bearing rocks	Fine-grained sands, often clay with layers of clay and siltstone, also sandstones	
Type of aquifer: unconfined or artesian	Pressure	
Overlapping rocks	Pliocene sandy-clay deposits and Aeolian-deluvial deposits in the northern Kuyalnik clay in the east of the basin	
Power of the GWB, min-max/average, m	0.3-1.0 to 40-45 10-12	
Filtration coefficient, k min.-max./average, m/day	0.1-12.0 sometimes up to 58 m/day	
Water supply, km, min.-max./average, m /day^2	0,5-180 50	
PV head, min-max/average, m	2-47 20	
Average annual fluctuations in the level of PV, m	0,3-0,4	
Use for water withdrawal >10 m^3 /day: ac/no	Yes	
Number of captive sources	-	
Number of operational units.	About 30	
Chemical composition (mineralisation, major anions, cations)	Mineralisation from 0.2-0.7 g/dm^3 to 37.5 HCO_3 Ca, Ca-Na, Mg-Na, HCO_3 -SO4 Mg-Na	
Main power supply	Infiltration of precipitation and overflow from the Neogene pressure limestone, which lie below.	
Relationship to surface water	No.	
RPV trend	Levels are stable	
The predominant human activity	Water extraction	
Chemical status of the GWB	Good, sometimes satisfactory	
Quantitative status of the GWB	Good	
Reliability of information	High	
Annual precipitation, mm	490-630	

Table 6. Characteristics of the group of GWB in Upper Miocene terrigenous carbonate sediments

Parameters.	Characteristics
Unified code of the GWB	UAM6900N100
GWB code	UAM6900N100
Name of the GWB	A group of GWB in Upper Miocene terrigenous carbonate sediments
Area of the GWB	22700
Geological index	N_1 s +m+p_{2+3}
Lithology of water-bearing rocks	Limestone, sandstone, and sand layers
Type of aquifer: non-pressure or artesian	Pressure
Overlapping rocks	Loams, clays, sandy rocks
Power of the MPSV, min-max/average, m	From 5-10 and more to 200 m 20-30
Filtration coefficient, k min.-max./average, m/day	From 2-6 to 480 10-15
Water supply, km, min.-max./average, m /day^2	50-400 190
PV head, min-max/average, m	3-150 30
Average annual fluctuations in the level of PV, m	0,2-08
Use for water withdrawal >10 m^3 /day: yes/no	Yes
Number of captive sources	-
Number of operational units.	More than 500
Chemical composition (mineralisation, main anions, cations)	Mineralisation 1.0-3.0 g/dm^3 , HCO_3 Ca, Mg-Ca, HCO_3 SO_4 Ca, Ca-Mg, SO_4 -Cl Na-Mg
Main power supply	Infiltration of precipitation, water flow from overlying aquifers and complexes.
Relationship to surface water	No.
GWB trend	Levels are stable
The predominant human activity	Water extraction
Chemical status of the GWB	Good
Quantitative status of the GWB	Good
Reliability of information	High
Annual precipitation, mm	430-480

Lithological and hydrogeological column

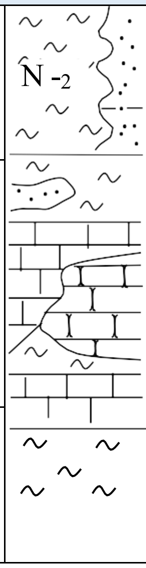
		5-90 to 200m	HCO_3 Ca, Mg-Ca, HCO -SO_{34} Ca-Mg, SO -4 Cl Na-Mg Mg-Na, M 1.0-3.0 g/dm^3
N_1		Kf 2-. 480 m/d, km 50-. 400 m /d^2 100-300 м	
N_1			

Table 7. Characteristics of the group of GWB in Paleocene and Eocene sediments

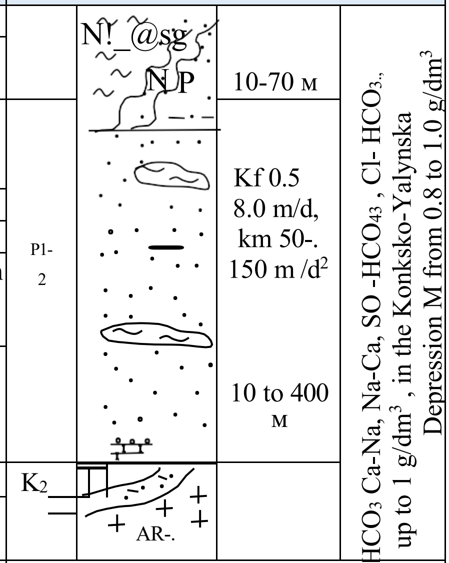
Parameters.	Characteristics	Lithological and hydrogeological column
Unified code of the GWB	UAM690PG100	
GWB code	UAM690PG100	
Name of the GWB	The group of GWB in the Paleocene and Eocene deposits	
Area of the GWB	1106,9	
Geological index	Pg1-2	
Lithology of water-bearing rocks	The sands are of various grains with sandstone and clay layers, lignite	
Type of aquifer: unconfined or artesian	Pressure	
Overlapping rocks	Clays, sandy rocks	
Power of the GWB, min - max / average, m	10-400 20-30	
Filtration coefficient, k min.-max./average, m/day	0,5-8,0 4	
Water supply, km, min.-max./average, m /day^2	50-150 70	
PV head, min-max/average, m	5-227 7-10	
Average annual fluctuations in the level of PV, m	0,33-1,1	
Use for water withdrawal >10 m^3 /day: yes/no	Yes	
Number of captive sources	-	
Number of operational units.	More than 100	
Chemical composition (mineralisation, major anions, cations)	Mineralisation up to 1 g/dm^3 , HCO_3 Ca-Na, Na-Ca, SO_4 - HCO_3 , Cl-HCO_3	
Main power supply	Infiltration of precipitation, flow from horizons below and above	
Relationship to surface water	-	
GWB trend	Levels are stable	
The predominant human activity	Water abstraction for water supply to individual settlements, etc.	
Chemical status of the GWB	Good	
Quantitative status of the GWB	Good	
Reliability of information	High	
Annual precipitation, mm	540-650	

Table 9. Characteristics of the group of GWB in terrigenous deposits of the Upper Cretaceous (Molochna River basin)

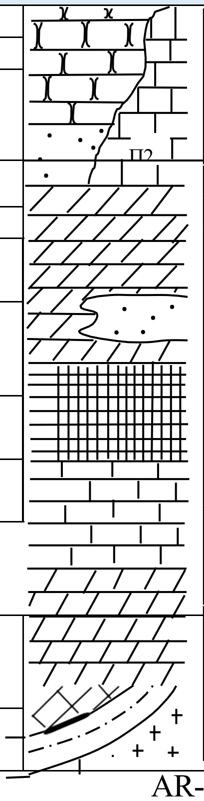
Parameters.	**Characteristics**	**Lithological and hydrogeological column**
Unified code of the GWB	UAM6900K300	
GWB code	UAM6900K300	
Name of the GWB	GWB in terrigenous sediments of the Upper Cretaceous (basin p. Dairy)	
Area of the GWB	1161	
Geological index	K_2	
Lithology of water-bearing rocks	Cracked marl, chalk, limestone	
Type of aquifer: unconfined or artesian	Pressure	
Overlapping rocks	Sands	
Power of the GWB, min - max / average, m	10-50 and more 30	
Filtration coefficient, k min-max/average, m/day	1.5-10, sometimes more 7,0	
Water supply, km, min-max/average, m /day²	10-150 180-250	
PV head, min-max/average, m	From 15-20 to 370	
Average annual fluctuations in the level of GWB, m	0,3	
Use for water withdrawal >10 m³ /day: yes/no	Yes	
Number of captive sources	-	
Number of operational units.		
Chemical composition (mineralisation, major anions, cations)	$Cl\text{-}SO_4$ Ca-Na, mineralisation 0.8-1.2 g/dm³ ; Cl-HCO $\text{-}SO_{34}$ Na- Ca, HCO_3 Ca, SO $\text{-}HCO_{43}$ Na-Ca	
Main power supply	Infiltration of precipitation,	
Relationship to surface water	-	
GWB trend	Levels are stable	
The predominant human activity	Operation for domestic and drinking purposes	
Chemical status of the GWB	Good	
Quantitative status of the GWB	Good	
Reliability of information	High	
Annual precipitation, mm	460-560	

Table 10. Characteristics of the group of GWB in terrigenous sediments of the Upper Cretaceous (Krynka River basin)

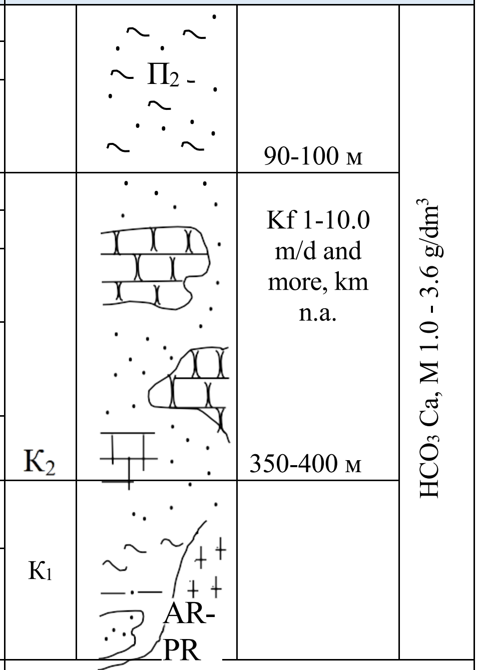
Parameters.	Characteristics	Lithological and hydrogeological column
Combined GWB code	UAM6900K200	
GWB code	UAM6900K200	
Name of the GWB	GWB in terrigenous sediments of the Upper Cretaceous (basin Krynka River)	
Area of the GWB	577,4	
Geological index	K_2	
Lithology of water-bearing rocks	Sands, sandstones, marls	
Type of aquifer: unconfined or artesian	Pressure	
Overlapping rocks	Terrigenous deposits	
Power of the MPSV, min-max/average, m	5-220 n.d.	
Filtration coefficient, k min.-max./average, m/day	0,5-15 7	
Water supply, km, min.-max./average, m /day^2	1-100	
PV head, min-max/average, m	Up to 5-400	
Average annual fluctuations in the level of PV, m	0,2-0,3	
Use for water withdrawal >10 m^3 /day: yes/no	Yes	
Number of captive sources	-	
Number of operational units.	About 30	
Chemical composition (mineralisation, major anions, cations)	HCO_3 Ca, with mineralisation up to 1.0-3.6 g/dm^3	
Main power supply	Infiltration of precipitation	
Relationship to surface water	-	
GWB trend	Levels are stable	
The predominant human activity	Use for household needs	
Chemical status of the GWB	Good	
Quantitative status of the GWB	Good	
Reliability of information	High	
Annual precipitation, mm	430-490	

Table 11. Group of GWB in Lower Cretaceous terrigenous sediments (Molochna River basin)

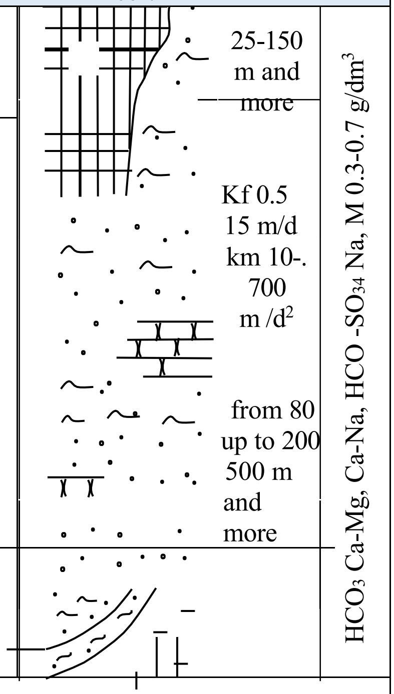
Parameter.	**Characteristics**	**Lithological and hydrogeological column**
Combined GWB code	UAM6900K100	
GWB code	UAM6900K100	
Name of the GWB	Group of GWB in Lower Cretaceous terrigenous sediments (Molochna River basin)	K_1
Area of the GWB	1356	
Geological index	K_1	
Lithology of water-bearing rocks	Fine- and fine-grained sands, sandstones with clay interlayers	
Type of aquifer horizon: non-pressure or artesian	Pressure	
Overlapping rocks	Chalk, marl, sands, loams	
Power of the GWB, min - max / average, m	From 5 to 100 20-70	
Filtration coefficient, k min.-max./average, m/day	0,5-15 7,0	
Water supply, km, min.-max./average, m /day^2	10-700 100-200	
PV head, min-max/average, m	From 1-10 to 500 15-20	
Average annual fluctuations in the level of GWB, m	0,2-0,5	
Number of captive sources	-	
Number of operational units.	More than 50	
Use for water withdrawal >10 m^3 /day: yes/no	Yes	
Chemical composition (mineralisation, major anions, cations)	HCO_3 Ca-Mg, Ca-Na, HCO_3 -SO_4 Na, mineralisation 0.3-0.8 g/dm^3	
Main power supply	Infiltration of precipitation	
Relationship to surface water		
GWB trend	Level recovery	
The predominant human activity	Operation for centralised water supply	
Chemical status of the GWB	Good	
Quantitative status of the GWB	Good	
Reliability of information	High	
Annual precipitation, mm	540-650	

Table 12. Characteristics of GWB in the sandy-clayey thickness of coalbed methane deposits

Parameters.	Characteristics	Lithological and hydrogeological column
Unified code of the GWB	UAM6900C200	
GWB code	UAM6900C200	
Name of the GWB	GWB in sandy-clayey coalbed methane deposits	
Area of the GWB	6305	
Geological index	C_1^2 -C_3^3	
Lithology of water-bearing breeds	fractured limestone and sandstones, which alternate with mudstones, siltstones and coal	
Type of aquifer horizon: non-pressure or artesian	Pressure	
Overlapping rocks	Sand and clay rocks	
Capacity of the GWB, min. max/average, m	15-150 - sandstones 2-10 - limestone 40-70	
Filtration coefficient, k min-max/average, m/day	0,001-98 17	
Water supply, km, min. max/average, m /day²	70-300 90	
PV head, min.-max. average, m	5-174 80	
Average annual fluctuations PV level, m	Up to 1-1.5	
Use for water withdrawal >10 m³ /day: yes/no	Yes	
Number of captive sources	-	
Number of operational units.	More than 25	
Chemical composition (mineralisation, main anions, cations)	SO_4 Na-Ca, Cl-SO_4 and SO_4 -HCO_3 Na-Ca mineralisation 0.5-3.0 g/dm³ ; sometimes 26.1	
Main source power supply	Infiltration of atmospheric precipitation	
Connection to the surface by the waters	In the areas of outcrops in the river valleys	
GWB trend	To reduce	
Predominant activity human	Operation for centralised water supply, mining and quarry drainage	
Chemical status of the GWB	Good	
Quantitative status of the GWB	Good	
Reliability of information	High	
Annual precipitation, mm	460-530	

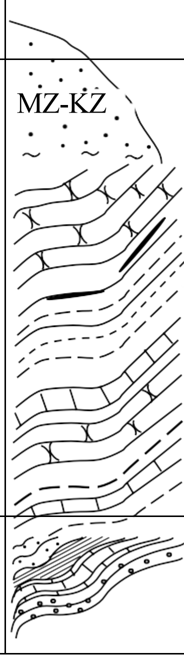


Table 13. Characteristics of the GWB group in the Lower Carboniferous limestone-dolomite formation

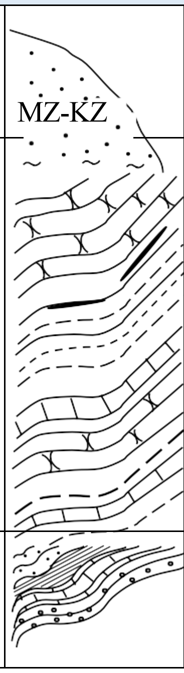
Parameters.	Characteristics	Lithological and hydrogeological column
Combined GWB code	UAM6900C100	 SO_4 Na-Ca, Cl-SO_4 , SO_4 -HCO_3 Na-Ca, M 1.0-1.5
GWB code	UAM6900C100	
Name of the GWB	GWB in the Lower Carboniferous limestone-dolomite sequence	MZ-KZ; 0-20 and more m
Area of the GWB	186,97	
Geological index	C_1^1	Kf 0.0001-. 100 m/d, km 70-300 m /d^2
Lithology of water-bearing breeds	Cracked and karstic and dolomitised limestone	
Type of aquifer: unconfined or artesian	Pressure	C
Overlapping rocks	Sand and clay rocks	
Power of the MPSV, min-max/average, m	40-100 40-70	1000-1500 and more m
Filtration coefficient, k min-max/average, m/day	0,0001-100 20	D
Water supply, km, min. max/average, m /day^2	70-300 90	
PV head, min.-max. average, m	5-174 80	
Average annual fluctuations PV level, m	Up to 1-1.5	
Use for water withdrawal >10 m^3 /day: yes/no	Yes	
Number of captive sources	-	
Number of operational units.	More than 50	
Chemical composition (mineralisation, main anions, cations)	SO_4 Na-Ca, Cl-SO_4 and SO_4 -HCO_3 Na-Ca mineralisation 0.6-1.9 g/dm^3 ; 1.3-2.6 g/dm^3 sometimes more	
Main source power supply	Infiltration of atmospheric precipitation	
Connection to the surface by the waters	In the areas of outcrops in the river valleys	
GWB trend	To reduce	
Predominant activity human	Operation for centralised water supply, mining and quarry drainage	
Chemical status of the GWB	Good	
Quantitative status of the GWB	Good	
Reliability of information	High	
Annual precipitation, mm	454-520	

Table 14. Characteristics of GWB in Devonian sediments

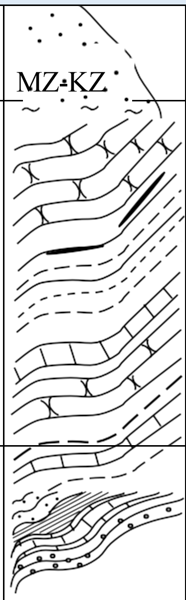
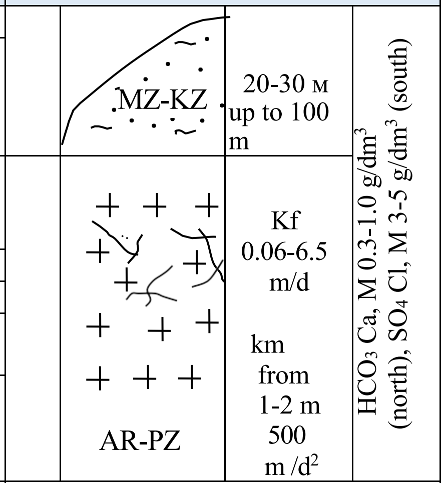
Parameters.	**Characteristics**	**Lithological and hydrogeological column**
Unified code of the GWB	UAM6900D200	
GWB code	UAM6900D200	
Name of the GWB	GWB in Devonian sediments	
Area of the GWB	156,1	
Geological index	D2-3	
Lithology of water-bearing rocks	Sandstones, limestones, conglomerates, shales	
Type of aquifer horizon: non-pressure or artesian	Pressure	
Overlapping rocks	Sand and clay rocks	
Capacity of the GWB, min. max/average, m	2-80 13-35	
Filtration coefficient, k min.-max./average, m/day	0,26-24,3 12	D
Water supply, km, min-max/average, m /day^2	10-200 160	
PV head, min-max/average, m	From 40 to 200	
Average annual fluctuations in the level of PV, m	0,4-0,5	
Use for water withdrawal >10 m^3 /day: yes/no	No.	
Number of captive sources	-	
Number of operational units.	N.v.	
Chemical composition (mineralisation, major anions, cations)	-SO_4 , SO_4 -, Ca, Na-Ca, Ca-Na, Na mineralisation 0.8-2.7 g/dm^3 up to 6.0 g/dm^3 - near tectonic faults	
Main power supply	Infiltration of precipitation	
Relationship to surface water	-	
GWB trend	Levels are stable	
The predominant human activity		
Chemical status of the GWB	Unsatisfactory	
Quantitative status of the GWB	Unsatisfactory	
Reliability of information	High	
Annual precipitation, mm	490-630	

Table 15. Characteristics of the GWB group in the Archean-Proterozoic (AR-PR) fracture zone

Parameters.	Characteristics	Lithological and hydrogeological column
Combined GWB code	UAM690AR100	
GWB code	UAM690AR100	
Name of the GWB	Group of GWB in the fracture zone of crystalline rocks of the Archean-Proterozoic	
Area of the GWB	10380	
Geological index	AR-PR	
Lithology of water-bearing rocks	Fractured granites, gneisses, migmatites	
Type of a q u i f e r : unconfined or artesian	Pressure and non-pressure	
Overlapping rocks	Kaolins, sandy clay breeds	
Capacity of the GWB, min. max/average, m	1-100 20-50	
Filtration coefficient, k min-max/average, m/day	0,06-6,5 3,0	
Water supply, km, min. max/average, m /day^2	From 1-2 to 500 5-50	
GWB head, min.-max. average, m	≤ 20	
Average annual fluctuations GWB level, m	From 0.3-0.6 to 3-4	
Use for water withdrawal >10 m^3 /day: yes/no	Yes	
Number of captive sources	-	
Number of operational units.	N.v.	
Chemical composition (mineralisation, main anions, cations)	HCO_3 Ca, mineralisation 0.3-1.0 g/dm3 (north), SO_4 Cl 3-5 g/dm^3 (south)	
Main source power supply	Infiltration of atmospheric precipitation, flowing from the horizons that lie above	
Connection to the surface by the waters	In the river valleys	
GWB trend	Levels are stable	
Predominant activity human	Operation for centralised water supply	
Chemical status of the GWB	Good	
Quantitative status of the GWB	Good	
Reliability of information	High	
Annual precipitation, mm	430-650	

Annex 2 List of cases of destruction, stoppages, and disruptions of the technological process of enterprises in the Azov sea RBD

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
1	02.03.2022	Yenakiieve Steel	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	48.22	38.21	Yenakiyevo	Yenakiyevo	Horlivka	Donetsk
2	02.03.2022	Yenakiieve Steel	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Power outage	48.22	38.21	Yenakiyevo	Yenakiyevo	Horlivka	Donetsk
3	03.03.2022	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Power outage	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
4	03.03.2022	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Disruption of work	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
5	03.03.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Power outage	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
6	03.03.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Disruption of work	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
7	08.03.2022	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Disruption of work	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
8	08.03.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Disruption of work	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
9	15.03.2022	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
10	15.03.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
11	17.03.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
12	18.03.2022	Design and construction company Azovintex	Production of construction materials and products	Not defined	Environment + Population	Disruption of work	47.09	37.54	Mariupol	Mariupolska	Mariupol	Donetsk
13	19.03.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
14	21.03.2022	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Disruption of work	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
15	21.03.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
16	02.04.2022	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
17	08.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
18	09.04.2022	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
19	11.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
20	13.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
21	17.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
22	18.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
23	19.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
24	20.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
25	21.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
26	24.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
27	24.04.2022	Pumping station I of the South Donbass water supply system	Drinking water supply	chlorine	Environment	Power outage	48.21	37.96	Panteleimonovka	Horlivka	Horlivka	Donetsk

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
28	25.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
29	26.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
30	26.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
31	27.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
32	28.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
33	28.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
34	29.04.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitud e	Settlem ent	Territo rial commu nity	District	Area.
35	03.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
36	03.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
37	04.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
38	04.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
39	05.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
40	06.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
41	07.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
42	08.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
43	09.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
44	10.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
45	10.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
46	10.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
47	10.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
48	12.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
49	12.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
50	13.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
51	13.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
52	14.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
53	15.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
54	16.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
55	18.05.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
56	09.07.2022	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
57	09.07.2022	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
58	22.07.2022	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Disruption of work	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
59	28.11.2022	Dam on the Kalchik River	Hydraulic structures	Not defined	Environment + Population	Dismantling	47.11	37.56	Mariupol	Mariupolska	Mariupol	Donetsk
60	08.01.2023	Donetsk Metal Rolling Plant	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	48.06	37.79	Donetsk	Donetsk	Donetsk	Donetsk
61	23.02.2023	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
62	05.05.2023	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk

№	Date.	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
63	26.05.2023	Azovstal Iron and Steel Works	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.09	37.59	Mariupol	Mariupolska	Mariupol	Donetsk
64	13.07.2023	Ilyich Iron and Steel Works of Mariupol	Production of iron, steel and ferroalloys	heavy metals	Environment + Population	Destruction of infrastructure	47.17	37.55	Mariupol	Mariupolska	Mariupol	Donetsk
65	13.07.2023	Tokmak Forging and Stamping Plant	Non-ferrous metal production	heavy metals	Environment + Population	Destruction of infrastructure	47.23	35.68	Tokmak	Tokmak	Polohovsky	Zaporizhzhya

Annex 3.1 Information on the number of damaged and destroyed sewage treatment plants (STPs) and sewage pumping stations (SPSs) [45]

Administrative-territorial region: Zaporizhzhia oblast, Donetsk and Kherson oblasts within the Azov river basin

№	District	Territorial community	Settlement	Balance sheet holder of structures	The KOS was destroyed, quantity	The CNS was destroyed, quantity	The KOS was damaged, quantity	The CNS was damaged, quantity	Surface water body	The cause of the destruction or damage CPS and CSCs
Azov River Basin										
Zaporizhzhya region										
1	Polohovsky	Tokmak	Tokmak	Municipal enterprise "Miskvodokanal" of the TMC	-	-	-	1	p. Dairy	The GIS is damaged (55 kW frequency converter), the degree of damage cannot be determined*.
2	Berdiansk	Berdiansk	Berdiansk	Municipal enterprise "Berdianskvodokanal" of the City Council	No information available				Sea of Azov	No information available*.
3	Melitopol	Melitopol	Melitopol	Municipal enterprise "Vodokanal" of the city of Mariupol	No information available				p. Dairy	No information is available *.
4	Melitopol	Novenskaya	Fruktove	KP "Novy Byt"	No information available				p. Maly Utlyuk	No information is available*.
5	Berdiansk	Primorskaya	Primorsk	ME "Clean City Primorsk"	No information available				Filtration fields of the Obitochna River	No information is available*.
Donetsk region (according to the SD of the RRBU)										
6	Mariupol	Mariupolska	Mariupol	Municipal enterprise "Mariupolvodokanal"	No information available				Sea of Azov	No information is available*.
7	Volnovakha	Volnovakha	Volnovakha	Volnovakha water and wastewater treatment plant of the Water of Donbass Company	No information available				p. Wet Volnovakha	No information is available*.

[45] Note * - The territory is temporarily occupied. The state of damage will be determined after de-occupation.

№	District	Territorial community	Settlement	Balance sheet holder of structures	The KOS was destroyed, quantity	The CNS was destroyed, quantity	The KOS was damaged, quantity	The CNS was damaged, quantity	Surface water body	The cause of the destruction or damage CPS and CSCs
8	Volnovakha	Olgynska	Novotroitske village	Volnovakha water and wastewater treatment plant of the Water of Donbass Company	No information available				p. Dry Volnovakha	No information is available *.
9	Volnovakha	Myrnenska	Myrne village	Volnovakha water and wastewater treatment plant of the Water of Donbass Company	No information available				p. Kalmius	No information is available *.
10	Mariupol	Mariupolska	Mariupol	Mariupol Regional Branch of the Water of Donbass Company	No information available				Staro-Krymske reservoir on the Kalchik River	No information is available*.
11	Volnovakha	Volnovakha	Donske village	ME Donkomunkhoz	No information available				p. Small Kalchik	No information is available*.

Annex 3 List of Emerald Network sites within the Azov Sea RBD

№	Name of the territory	Code	Area, km^2
1	Askania-Nova Biosphere Reserve	UA0000016	333,98
2	Ukrainian steppe nature reserve	UA0000019	33,55
3	Azov-Sivash National Nature Park	UA0000027	519,83
4	Donetsk Ridge Regional Landscape Park	UA0000063	74,51
5	Meotida National Nature Park	UA0000065	221,99
6	Botanical reserve of local importance "Prystenske"	UA0000066	3,58
7	Azov National Nature Park	UA0000092	779,0
8	Protected tract "Mariupol Forest Dacha" with adjacent territories	UA0000096	1,29
9	Eastern Syvash (part)	UA0000131	1749,75
10	Landscape reserve of national significance "Obytochna Spit"	UA0000150	254,62
11	Grabova Balka (near the nationally important reserve "Grabove tract")	UA0000157	19,05
12	Chongarsky	UA0000213	344,43
13	Nagolny Kryazh, a customer of local importance	UA0000218	44,45
14	Korsak-Mohyla landscape reserve	UA0000223	1,11
15	"Troitskaya Balka" (local natural monument "Virgin land along the railway")	UA0000224	6,62
16	Canyon of the Kalmius River and its main tributaries (Kalmius River Valley)	UA0000314	401,429
17	Berda River Valley with tributaries in Donetsk Oblast Berda River Valley with tributaries in Zaporizhzhia region	UA0000349	126,8127
18	The Great Agaimai sub	UA0000366	48,4916
19	Domuzlinsky under	UA0000369	47,428
20	Near Syvashyk (an area represented by a rare natural forest cover - podium vegetation)	UA0000371	15,4861
21	Murava way - a complex of beams in the valleys of the Molochna, Chingul, Kurkulak rivers, as well as the floodplains of the Molochna River (Zaporizhzhia region, the outskirts of Molochansk and Tokmak)	UA0000375	99,2824

Annex 4 List of places of recreation and leisure within the Azov Sea RBD

As of November 2023, no recreational sites have been identified in the Azov River Basin due to the occupation of the basin.

Annex 5 List of surface water monitoring sites in the Azov Sea RBD

№	SWB code	Name of the SWB	Name of the monitoring point	Code of the monitoring point	Geographical coordinates		River basin area	Sub-basin	SWB category	Type of SWB
					Length	Latitude				
Diagnostic monitoring										
1	UA_M6.9_0023	Malyi Utliuk River	Below is the discount of Akimzhilservice LLC	UA_M6.9_00023_01	35°9'13 "E	46° 40'52 "N	Azov region	–	river	UA_R_12_M_1_Si
2	UA_M6.9_0027	Tashchenak River	Below the discharge of the Melitopol engine plant	UA_M6.9_00027_01	35°13'42 "E	46° 41'06 "N	Azov region	–	river	UA_R_12_M_1_Si
3	UA_M6.9_0037	Molochna River (Tokmak)	1.0 km below the town of Tokmak	UA_M6.9_00037_01	35°38'00,08 "E	47° 13'26,73 "N	Azov region	–	river	UA_R_12_M_1_Si
4	UA_M6.9_0038	Molochna River (Tokmak)	0.5 km below the city of Melitopol	UA_M6.9_00038_01	35°22'42,04 "E	46°47'32,40 "N	Azov region	–	river	UA_R_12_L_1_Si
5	UA_M6.9_0074	Dziekelnia River	Priazovsky National Nature Park	UA_M6.9_00074_01	35°25'02 "E	46° 40'37 "N	Azov region	–	HMWB	no
6	UA_M6.9_0089	Korsak River	The mouth of the Korsak River, Priazovsky National Nature Park	UA_M6.9_0089_01	35°51'35 "E	46° 38'11 "N	Azov region	–	river	UA_R_12_M_1_Si
7	UA_M6.9_0100	Lozovatka River	1 km below the village of Novooleksiyivka	UA_M6.9_00100_01	36°10'19,67 "E	46° 47'03,18 "N	Azov region	–	river	UA_R_12_M_1_Si
8	UA_M6.9_0110	Obitochna River	0.5 km below the town of Primorsk	UA_M6.9_00110_01	36°21'10,88 "E	46° 43'21,13 "N	Azov region	–	river	UA_R_12_L_1_Si
9	UA_M6.9_0137	Berda River	Below the discharge of the NGO JSC "Ukrainian Railways" Branch "Industrial Management Centre" of the " Trudivsky Quarry" (near the village of Titove, Bilmatsky district)	UA_M6.9_00137_01	36°38'29 "E	47° 13'11 "N	Azov region	–	river	UA_R_12_S_1_Si
10	UA_M6.9_0138	Berda River	Polovtsian Steppe Regional Landscape Park, Zakharivka village, Donetsk region	UA_M6.9_00138_01	36°58'20 "E	47° 8'29 "N	Azov region	–	river	UA_R_12_M_1_Si

№	SWB code	Name of the SWB	Name of the monitoring point	Code of the monitoring point	Geographical coordinates		River basin area	Sub-basin	SWB category	Type of SWB
					Length	Latitude				
11	UA_M6.9_0175	Karatysh River	Gyrylo, Starodubivka village	UA_M6.9_00175_01	37°1'17.156 "E	47° 6'4.975 "N	Azov region	–	river	UA_R_12_M_1_Si
12	UA_M6.9_0202	Mokra Bilosarayska river	Meotida Nature Reserve Emerald Network, Donetsk region	UA_M6.9_00202_01	37°16'58 "E	46°56'15 "N	Azov region	–	HMWB	no
13	UA_M6.9_0213	Kalmius River	14 km above the city of Mariupol; 0.5 km above the village of Primorske (Sartana); 1 km above the gauging station (hydromet point 13506)	UA_M6.9_00213_01	37°42'18.83 "E	47°10'20.35 "N	Azov region	–	river	UA_R_16_L_1_Si
14	UA_M6.9_0213	Kalmius River	the mouth, the city of Mariupol	UA_M6.9_00213_02	37°34'17.99 "E	47° 06'02.98 "N	Azov region	–	river	UA_R_16_L_1_Si
15	UA_M6.9_0290	Kalchik River	the mouth, the city of Mariupol	UA_M6.9_00290_02	37°33'32.90 "E	47° 06'52.71 "N	Azov region	–	river	UA_R_16_L_1_Si
16	UA_M6.9_0309	Maly Kalchik River	Below the discharge of Kalchytskyi Quarry PJSC Kalchyk village, Mariupol district	UA_M6.9_00309_01	37°31'57.772 "E	47° 20'16.797 "N	Azov region	–	river	UA_R_16_M_1_Si
Operational monitoring										
17	UA_M6.9_0140	Berdiansk reservoir	Drinking water intake from the Berdiansk reservoir by Berdianskvodokanal	UA_M6.9_00140_01	36°51'11 "E	46° 56'44 "N	Azov region	–	HMWB	no
18	UA_M6.9_0289	Kalchik River	23 km, Staro-Krymske Reservoir, surface water intake of Mariupol Regional Water Management Department of the Water of Donbass Utility	UA_M6.9_0289_01	37°30′11″E	47°11′27″N	Azov region	–	HMWB	no

№	SWB code	Name of the SWB	Name of the monitoring point	Code of the monitoring point	Geographical coordinates		River basin area	Sub-basin	SWB category	Type of SWB
					Length	Latitude				
19	UA_M6.9_0515	P-9 channel	ESC of the Western group water supply system of the KP "Oblavvodokanal" (Yakymivske village)	UA_M6.9_0515_01	34°54'47 "E	46° 38'20 "N	Azov region	–	AWB	no

Annex 6 Integrated assessment table of the state of the SWBs in the Azov Sea River basin for 2021-2023

#	Surface water body				Biological indicators								Basin specific				Artificial and substantially modified IPA			Chemical state	
	Name of river/lake/transitional/coastal	Code.	Type	The length of the pipeline, km	Phytoplankton	Microphytobenthos	Vascular plants	Bottom macroinvertebrates	The state of the MPA by biological indicators	Assessment reliability level*.	Hydromorphological indicators - high status (Yes/No)	Chemical and physicochemical parameters	Basin specific	Assessment reliability level*.	Environmental status	Assessment reliability level*.	Artificial MPV (Yes/No)	Substantially amended MOU (Yes/Candidate)	Environmental potential	Chemical state****.	Assessment reliability level*.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	Malyi Utliuk River	UA_M6.9_0023	UA_R_12_M_1_Si	51,2	n/a	n/a	n/a	n/a			yes	n/a	3							ND	C
2	Tashchenak River	UA_M6.9_0027	UA_R_12_M_1_Si	48,9	n/a	n/a	n/a	n/a			yes	n/a	3							D	C
3	Molochna river	UA_M6.9_0037	UA_R_12_M_1_Si	39,7	n/a	n/a	n/a	n/a				3	3							D	C
4	Molochna river	UA_M6.9_0038	UA_R_12_L_1_Si	106,4	n/a	n/a	n/a	n/a			yes	3	3							D	C
5	Dziekelnia River	UA_M6.9_0074	no	3,1	n/a	n/a	n/a	n/a			-	3	3					HMWB		D	C
6	Korsak River	UA_M6.9_0089	UA_R_12_M_1_Si	48,3	n/a	n/a	n/a	n/a			yes	3	3							D	C
7	Lozovatka river	UA_M6.9_0100	UA_R_12_M_1_Si	55,1	n/a	n/a	n/a	n/a			yes	3	3							D	C
8	Obitochna river	UA_M6.9_0110	UA_R_12_L_1_Si	29,6	n/a	n/a	n/a	n/a			no	3	3							ND	C
9	Berda river	UA_M6.9_0137	UA_R_12_S_1_Si	13,8	n/a	n/a	n/a	n/a			no	3	3							D	C
10	Berda river	UA_M6.9_0138	UA_R_12_M_1_Si	51,3	n/a	n/a	n/a	n/a			yes	n/a	3							D	C
11	Berdiansk reservoir	UA_M6.9_0140	no	2,6	n/a	n/a	n/a	n/a			-	3	3					HMWB		D	C
12	Karatysh River	UA_M6.9_0175	UA_R_12_M_1_Si	6,3	n/a	n/a	n/a	n/a			yes	n/a	3							D	C
13	Mokra Belosarayskaya River	UA_M6.9_0202	no	15,2	n/a	n/a	n/a	n/a			-	n/a	3					HMWB		D	C
14	Kalmius River	UA_M6.9_0213	UA_R_16_L_1_Si	44,0	n/a	n/a	n/a	n/a			no	n/a	3							ND	C
15	Kalchik River	UA_M6.9_0289	no	4,9	n/a	n/a	n/a	n/a			no	3	3					HMWB		D	C
16	Kalchik River	UA_M6.9_0290	UA_R_16_L_1_Si	24,5	n/a	n/a	n/a	n/a				n/a	3							D	C
17	Maly Kalchik River	UA_M6.9_0309	UA_R_16_M_1_Si	8,4	n/a	n/a	n/a	n/a			no	n/a	3							D	C
18	P-9 channel	UA_M6.9_0515	no	69,3	n/a	n/a	n/a	n/a			-	2	2				AWB			D	C

Notes:

-	not applicable
н/пр	no monitoring was conducted
б/о	without assessment

Level of reliability of the assessment **

В	high
С	medium
Н	low

Ecological status/potencial:

1	High
2	Good
3	Moderate
4	Poor
5	Bad

Chemical status**

D	Good
ND	Failing to achieve good

Annex 8 Achievement of environmental objectives for the Azov Sea RBD in 2030

Table 1: Achievement of the environmental objectives of the SWB in 2030

№	Title SWB	Code SWB	Category (PR, HMWB/AWB)[46]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental objectives, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[47]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
1	2	3	4	5	6	7	8	9
SWBs without risk								
1	Bolshaya Kalga	UA_M6.9_0007	PR	risk-free	risk-free	yes	yes	
2	Bolshaya Kalga	UA_M6.9_0009	PR	risk-free	risk-free	yes	yes	
3	Bolshaya Kalga	UA_M6.9_0010	PR	risk-free	risk-free	yes	yes	
4	Untitled	UA_M6.9_0011	PR	risk-free	risk-free	yes	yes	
5	Kalmius	UA_M6.9_0206	PR	risk-free	risk-free	yes	yes	
6	Kalmius	UA_M6.9_0208	PR	risk-free	risk-free	yes	yes	
7	Kalmius	UA_M6.9_0209	PR	risk-free	risk-free	yes	yes	
8	Kalmius	UA_M6.9_0211	PR	risk-free	risk-free	yes	yes	
9	Wide	UA_M6.9_0214	PR	risk-free	risk-free	yes	yes	
10	Wide	UA_M6.9_0216	PR	risk-free	risk-free	yes	yes	
11	Bogodukhova	UA_M6.9_0219	PR	risk-free	risk-free	yes	yes	
12	Gruzka	UA_M6.9_0223	PR	risk-free	risk-free	yes	yes	
13	Berestovaya	UA_M6.9_0233	PR	risk-free	risk-free	yes	yes	
14	Berestova	UA_M6.9_0234	PR	risk-free	risk-free	yes	yes	
15	Berestova	UA_M6.9_0236	PR	risk-free	risk-free	yes	yes	
16	Komyshuvakha	UA_M6.9_0237	PR	risk-free	risk-free	yes	yes	
17	Komyshuvakha	UA_M6.9_0239	PR	risk-free	risk-free	yes	yes	
18	Loikova	UA_M6.9_0241	PR	risk-free	risk-free	yes	yes	
19	Loikova	UA_M6.9_0243	PR	risk-free	risk-free	yes	yes	
20	Wet Volnovakha	UA_M6.9_0245	PR	risk-free	risk-free	yes	yes	
21	Wet Volnovakha	UA_M6.9_0247	PR	risk-free	risk-free	yes	yes	
22	Wet Volnovakha	UA_M6.9_0249	PR	risk-free	risk-free	yes	yes	
23	Baklamashova	UA_M6.9_0250	PR	risk-free	risk-free	yes	yes	
24	Baklamashova	UA_M6.9_0251	PR	risk-free	risk-free	yes	yes	
25	Dry Volnovakha	UA_M6.9_0254	PR	risk-free	risk-free	yes	yes	
26	B. Dolin-Tamara	UA_M6.9_0255	PR	risk-free	risk-free	yes	yes	
27	B. Dolin-Tamara	UA_M6.9_0259	PR	risk-free	risk-free	yes	yes	
28	Balmatour	UA_M6.9_0260	PR	risk-free	risk-free	yes	yes	

46 PR - SWB of natural categories (rivers, lakes, transitional, coastal), HMWB/AWB – heavily modified or artificial SWB

47 NN - natural causes, TA - technical causes (lack of technical solution, technical impracticality or impracticability), VH - disproportionately high cost, VO - causes related to military operations, temporary occupation of the territory, NA - unknown causes

№	Title SWB	Code SWB	Category (PR, HMWB/AWB)[46]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental objectives, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[47]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
29	Balmatour	UA_M6.9_0262	PR	risk-free	risk-free	yes	yes	
30	Komyshuvakha	UA_M6.9_0263	PR	risk-free	risk-free	yes	yes	
31	Komyshuvakha	UA_M6.9_0265	PR	risk-free	risk-free	yes	yes	
32	B. Bloody	UA_M6.9_0266	PR	risk-free	risk-free	yes	yes	
33	Dubivka	UA_M6.9_0267	PR	risk-free	risk-free	yes	yes	
34	Dubivka	UA_M6.9_0269	PR	risk-free	risk-free	yes	yes	
35	Dubivka	UA_M6.9_0270	PR	risk-free	risk-free	yes	yes	
36	Kichiksu	UA_M6.9_0271	PR	risk-free	risk-free	yes	yes	
37	Kichiksu	UA_M6.9_0273	PR	risk-free	risk-free	yes	yes	
38	Kichiksu	UA_M6.9_0274	PR	risk-free	risk-free	yes	yes	
39	Kichiksu	UA_M6.9_0276	PR	risk-free	risk-free	yes	yes	
40	Karansu	UA_M6.9_0277	PR	risk-free	risk-free	yes	yes	
41	Karansu	UA_M6.9_0278	PR	risk-free	risk-free	yes	yes	
42	Ternovaya	UA_M6.9_0279	PR	risk-free	risk-free	yes	yes	
43	Willow	UA_M6.9_0280	PR	risk-free	risk-free	yes	yes	
44	b. Veli Tarama	UA_M6.9_0293	PR	risk-free	risk-free	yes	yes	
45	Regimental	UA_M6.9_0297	PR	risk-free	risk-free	yes	yes	
46	Little Kalchik	UA_M6.9_0300	PR	risk-free	risk-free	yes	yes	
47	Little Kalchik	UA_M6.9_0304	PR	risk-free	risk-free	yes	yes	
48	Little Kalchik	UA_M6.9_0306	PR	risk-free	risk-free	yes	yes	
49	Wide	UA_M6.9_0316	PR	risk-free	risk-free	yes	yes	
50	Wide	UA_M6.9_0318	PR	risk-free	risk-free	yes	yes	
51	Wide	UA_M6.9_0319	PR	risk-free	risk-free	yes	yes	
52	Bolshaya Namennaya	UA_M6.9_0320	PR	risk-free	risk-free	yes	yes	
53	Bolshaya Namennaya	UA_M6.9_0321	PR	risk-free	risk-free	yes	yes	
54	Gruzky Elanchik	UA_M6.9_0322	PR	risk-free	risk-free	yes	yes	
55	Gruzky Elanchik	UA_M6.9_0324	PR	risk-free	risk-free	yes	yes	
56	Gruzky Elanchik	UA_M6.9_0326	PR	risk-free	risk-free	yes	yes	
57	Gruzky Elanchik	UA_M6.9_0330	PR	risk-free	risk-free	yes	yes	
58	Gruzky Elanchik	UA_M6.9_0332	PR	risk-free	risk-free	yes	yes	
59	Gruzky Elanchik	UA_M6.9_0333	PR	risk-free	risk-free	yes	yes	
60	Gruzky Elanchik	UA_M6.9_0334	PR	risk-free	risk-free	yes	yes	
61	Kamenka	UA_M6.9_0335	PR	risk-free	risk-free	yes	yes	
62	Kamenka	UA_M6.9_0337	PR	risk-free	risk-free	yes	yes	
63	Kamenka	UA_M6.9_0339	PR	risk-free	risk-free	yes	yes	
64	Stony	UA_M6.9_0340	PR	risk-free	risk-free	yes	yes	
65	Stony	UA_M6.9_0342	PR	risk-free	risk-free	yes	yes	
66	Stony	UA_M6.9_0343	PR	risk-free	risk-free	yes	yes	
67	Slide	UA_M6.9_0344	PR	risk-free	risk-free	yes	yes	
68	Slide	UA_M6.9_0346	PR	risk-free	risk-free	yes	yes	
69	Slide	UA_M6.9_0348	PR	risk-free	risk-free	yes	yes	
70	Slide	UA_M6.9_0349	PR	risk-free	risk-free	yes	yes	

№	Title SWB	Code SWB	Category (PR, HMWB/AWB)[46]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental objectives, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[47]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
71	Slide	UA_M6.9_0351	PR	risk-free	risk-free	yes	yes	
72	Khartsyzsk	UA_M6.9_0353	PR	risk-free	risk-free	yes	yes	
73	Khartsyzsk	UA_M6.9_0354	PR	risk-free	risk-free	yes	yes	
74	Wet Elanchik	UA_M6.9_0357	PR	risk-free	risk-free	yes	yes	
75	Wet Elanchik	UA_M6.9_0358	PR	risk-free	risk-free	yes	yes	
76	Dry Elanchik	UA_M6.9_0359	PR	risk-free	risk-free	yes	yes	
77	Dry Elanchik	UA_M6.9_0361	PR	risk-free	risk-free	yes	yes	
78	Dry Elanchik	UA_M6.9_0363	PR	risk-free	risk-free	yes	yes	
79	Dry Elanchik	UA_M6.9_0364	PR	risk-free	risk-free	yes	yes	
80	Dry Elanchik	UA_M6.9_0366	PR	risk-free	risk-free	yes	yes	
81	Mius	UA_M6.9_0367	PR	risk-free	risk-free	yes	yes	
82	Mius	UA_M6.9_0368	PR	risk-free	risk-free	yes	yes	
83	Mius	UA_M6.9_0369	PR	risk-free	risk-free	yes	yes	
84	Mius	UA_M6.9_0374	PR	risk-free	risk-free	yes	yes	
85	Miusik	UA_M6.9_0375	PR	risk-free	risk-free	yes	yes	
86	Miusik	UA_M6.9_0376	PR	risk-free	risk-free	yes	yes	
87	Miusik	UA_M6.9_0379	PR	risk-free	risk-free	yes	yes	
88	Deaf	UA_M6.9_0382	PR	risk-free	risk-free	yes	yes	
89	Deaf	UA_M6.9_0384	PR	risk-free	risk-free	yes	yes	
90	Kripenka	UA_M6.9_0385	PR	risk-free	risk-free	yes	yes	
91	Kripenka	UA_M6.9_0386	PR	risk-free	risk-free	yes	yes	
92	Gerasimova	UA_M6.9_0388	PR	risk-free	risk-free	yes	yes	
93	Gerasimova	UA_M6.9_0389	PR	risk-free	risk-free	yes	yes	
94	Naked	UA_M6.9_0391	PR	risk-free	risk-free	yes	yes	
95	Naked	UA_M6.9_0393	PR	risk-free	risk-free	yes	yes	
96	Naked	UA_M6.9_0394	PR	risk-free	risk-free	yes	yes	
97	Gruzka	UA_M6.9_0397	PR	risk-free	risk-free	yes	yes	
98	Gruzka	UA_M6.9_0398	PR	risk-free	risk-free	yes	yes	
99	Gruzka	UA_M6.9_0400	PR	risk-free	risk-free	yes	yes	
100	Rovenok	UA_M6.9_0402	PR	risk-free	risk-free	yes	yes	
101	Rovenok	UA_M6.9_0403	PR	risk-free	risk-free	yes	yes	
102	Dear	UA_M6.9_0405	PR	risk-free	risk-free	yes	yes	
103	Dear	UA_M6.9_0407	PR	risk-free	risk-free	yes	yes	
104	Dear	UA_M6.9_0408	PR	risk-free	risk-free	yes	yes	
105	Mobile	UA_M6.9_0409	PR	risk-free	risk-free	yes	yes	
106	Vyshnevetska	UA_M6.9_0412	PR	risk-free	risk-free	yes	yes	
107	Vyshnevetska	UA_M6.9_0414	PR	risk-free	risk-free	yes	yes	
108	Yuskin	UA_M6.9_0415	PR	risk-free	risk-free	yes	yes	
109	Yuskin	UA_M6.9_0416	PR	risk-free	risk-free	yes	yes	
110	Orikhova	UA_M6.9_0419	PR	risk-free	risk-free	yes	yes	
111	Orikhova	UA_M6.9_0420	PR	risk-free	risk-free	yes	yes	
112	Headband	UA_M6.9_0421	PR	risk-free	risk-free	yes	yes	

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113	Headband	UA_M6.9_0424	PR	risk-free	risk-free	yes	yes	
114	Dubrovka	UA_M6.9_0426	PR	risk-free	risk-free	yes	yes	
115	Dubrovka	UA_M6.9_0428	PR	risk-free	risk-free	yes	yes	
116	Dubrovka	UA_M6.9_0430	PR	risk-free	risk-free	yes	yes	
117	Olkhovchik	UA_M6.9_0431	PR	risk-free	risk-free	yes	yes	
118	Olkhovchik	UA_M6.9_0432	PR	risk-free	risk-free	yes	yes	
119	Krinka	UA_M6.9_0436	PR	risk-free	risk-free	yes	yes	
120	Krinka	UA_M6.9_0437	PR	risk-free	risk-free	yes	yes	
121	Bulavin	UA_M6.9_0441	PR	risk-free	risk-free	yes	yes	
122	Bulavin	UA_M6.9_0442	PR	risk-free	risk-free	yes	yes	
123	Bulavin	UA_M6.9_0444	PR	risk-free	risk-free	yes	yes	
124	Olkhovatka	UA_M6.9_0447	PR	risk-free	risk-free	yes	yes	
125	Olkhovatka	UA_M6.9_0449	PR	risk-free	risk-free	yes	yes	
126	Gardens	UA_M6.9_0454	PR	risk-free	risk-free	yes	yes	
127	Korsun	UA_M6.9_0455	PR	risk-free	risk-free	yes	yes	
128	Korsun	UA_M6.9_0458	PR	risk-free	risk-free	yes	yes	
129	Korsun	UA_M6.9_0460	PR	risk-free	risk-free	yes	yes	
130	Korsun	UA_M6.9_0461	PR	risk-free	risk-free	yes	yes	
131	Dewlap	UA_M6.9_0463	PR	risk-free	risk-free	yes	yes	
132	Dewlap	UA_M6.9_0465	PR	risk-free	risk-free	yes	yes	
133	Alder	UA_M6.9_0468	PR	risk-free	risk-free	yes	yes	
134	Alder	UA_M6.9_0470	PR	risk-free	risk-free	yes	yes	
135	Khartsyzsk	UA_M6.9_0473	PR	risk-free	risk-free	yes	yes	
136	Khartsyzsk	UA_M6.9_0475	PR	risk-free	risk-free	yes	yes	
137	Klinova	UA_M6.9_0478	PR	risk-free	risk-free	yes	yes	
138	Klinova	UA_M6.9_0479	PR	risk-free	risk-free	yes	yes	
139	Olkhovka	UA_M6.9_0481	PR	risk-free	risk-free	yes	yes	
140	Olkhovka	UA_M6.9_0483	PR	risk-free	risk-free	yes	yes	
141	Bolshaya Sklyovaya	UA_M6.9_0485	PR	risk-free	risk-free	yes	yes	
142	Orlovka	UA_M6.9_0487	PR	risk-free	risk-free	yes	yes	
143	Shishova	UA_M6.9_0488	PR	risk-free	risk-free	yes	yes	
144	Bolshaya Shishova	UA_M6.9_0489	PR	risk-free	risk-free	yes	yes	
145	Bolshaya Shishova	UA_M6.9_0490	PR	risk-free	risk-free	yes	yes	
146	Sevastianivka	UA_M6.9_0494	PR	risk-free	risk-free	yes	yes	
147	Sevastianivka	UA_M6.9_0495	PR	risk-free	risk-free	yes	yes	
148	Orlova	UA_M6.9_0496	PR	risk-free	risk-free	yes	yes	
149	Orikhova	UA_M6.9_0498	PR	risk-free	risk-free	yes	yes	
150	Komyshuvakha	UA_M6.9_0500	PR	risk-free	risk-free	yes	yes	
151	Komyshuvakha	UA_M6.9_0503	PR	risk-free	risk-free	yes	yes	
152	Kalinova I	UA_M6.9_0504	PR	risk-free	risk-free	yes	yes	
153	Kalinova I	UA_M6.9_0506	PR	risk-free	risk-free	yes	yes	
154	Kalinova II	UA_M6.9_0509	PR	risk-free	risk-free	yes	yes	

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155	Kalinova II	UA_M6.9_0510	PR	risk-free	risk-free	yes	yes	
156	Kakhovka Canal	UA_M6.9_0511	AWB	risk-free	risk-free	yes	yes	
157	P-5 channel	UA_M6.9_0513	AWB	risk-free	risk-free	yes	yes	
158	P-5-1 channel	UA_M6.9_0514	AWB	risk-free	risk-free	yes	yes	
159	Azov	UA_M6.9_0550	PR	risk-free	risk-free	yes	yes	
160	Azov	UA_M6.9_0556	PR	risk-free	risk-free	yes	yes	
161	Azov	UA_M6.9_0557	PR	risk-free	risk-free	yes	yes	
5% SWBs								
1	Great Utliuk	UA_M6.9_0016	HMWB	at risk	risk-free	yes	yes	
2	Little Utlyuk	UA_M6.9_0023	PR	at risk	possibly at risk	yes	yes	
3	Dairy (Tokmak)	UA_M6.9_0035	PR	at risk	risk-free	yes	yes	
4	Kainkulatske reservoir	UA_M6.9_0036	HMWB	at risk	risk-free	yes	yes	
5	Dairy (Tokmak)	UA_M6.9_0037	PR	at risk	possibly at risk	yes	yes	
6	Dairy (Tokmak)	UA_M6.9_0038	PR	at risk	possibly at risk	yes	yes	
7	Chingul	UA_M6.9_0049	PR	possibly at risk	risk-free	yes	yes	
8	Domuzla (Domuzgla)	UA_M6.9_0078	PR	possibly at risk	risk-free	yes	yes	
9	Vowed	UA_M6.9_0110	PR	at risk	risk-free	yes	yes	
10	Gruzka	UA_M6.9_0222	PR	at risk	possibly at risk	yes	yes	
11	Kolesnikova	UA_M6.9_0229	PR	at risk	possibly at risk	yes	yes	
12	Wet Volnovakha	UA_M6.9_0244	PR	at risk	possibly at risk	yes	yes	
13	Dry Volnovakha	UA_M6.9_0253	PR	at risk	possibly at risk	yes	yes	
14	B. Dolin-Tamara	UA_M6.9_0257	PR	risk-free	risk-free	yes	yes	
15	Krinka	UA_M6.9_0434	PR	risk-free	risk-free	yes	yes	
16	Bulavin	UA_M6.9_0440	PR	at risk	possibly at risk	yes	yes	
17	Bulavin	UA_M6.9_0446	PR	at risk	possibly at risk	yes	yes	
18	Gardens	UA_M6.9_0452	PR	risk-free	risk-free	yes	yes	
19	Alder	UA_M6.9_0469	HMWB	at risk	possibly at risk	yes	yes	
20	Sevastianivka	UA_M6.9_0492	PR	at risk	possibly at risk	yes	yes	
21	Orikhova	UA_M6.9_0499	PR	at risk	possibly at risk	yes	yes	
22	Utliutskyi estuary	UA_M6.9_0539	PR	at risk	possibly at risk	yes	yes	
all other SWBs								
1	Great Greyhounds	UA_M6.9_0001	HMWB	at risk	risk-free	no	yes	VD
2	Great Greyhounds	UA_M6.9_0002	HMWB	at risk	risk-free	no	yes	VD
3	Bolshaya Kalga	UA_M6.9_0003	PR	at risk	risk-free	no	yes	VD
4	Bolshaya Kalga	UA_M6.9_0004	HMWB	at risk	risk-free	no	yes	VD
5	Bolshaya Kalga	UA_M6.9_0005	PR	possibly at risk	risk-free	no	yes	VD
6	Bolshaya Kalga	UA_M6.9_0006	HMWB	at risk	risk-free	no	yes	VD
7	Bolshaya Kalga	UA_M6.9_0008	HMWB	at risk	risk-free	no	yes	VD
8	Untitled	UA_M6.9_0012	HMWB	at risk	risk-free	no	yes	VD
9	Yatmanai	UA_M6.9_0013	HMWB	at risk	risk-free	no	yes	VD
10	Yatmanai	UA_M6.9_0014	HMWB	at risk	risk-free	no	yes	VD
11	Great Utliuk	UA_M6.9_0015	PR	at risk	risk-free	no	yes	VD

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12	Great Utliuk	UA_M6.9_0017	PR	at risk	risk-free	no	yes	VD
13	Great Utliuk	UA_M6.9_0018	HMWB	at risk	risk-free	no	yes	VD
14	Great Utliuk	UA_M6.9_0019	PR	at risk	possibly at risk	no	yes	VD
15	Great Utliuk	UA_M6.9_0020	HMWB	at risk	risk-free	no	yes	VD
16	Great Utliuk	UA_M6.9_0021	HMWB	at risk	risk-free	no	yes	VD
17	Little Utlyuk	UA_M6.9_0022	HMWB	at risk	risk-free	no	yes	VD
18	Untitled	UA_M6.9_0024	HMWB	at risk	risk-free	no	yes	VD
19	Untitled	UA_M6.9_0025	HMWB	at risk	risk-free	no	yes	VD
20	Tashchenak	UA_M6.9_0026	PR	at risk	risk-free	no	yes	VD
21	Tashchenak	UA_M6.9_0027	PR	at risk	possibly at risk	no	yes	VD, TP
22	Tashchenak	UA_M6.9_0028	HMWB	at risk	risk-free	no	yes	VD
23	Tashchenak	UA_M6.9_0029	PR	at risk	risk-free	no	yes	VD
24	Dairy (Tokmak)	UA_M6.9_0030	PR	at risk	risk-free	no	yes	VD
25	Dairy (Tokmak)	UA_M6.9_0031	PR	at risk	risk-free	no	yes	VD
26	Dairy (Tokmak)	UA_M6.9_0032	HMWB	at risk	risk-free	no	yes	VD
27	Dairy (Tokmak)	UA_M6.9_0033	PR	at risk	risk-free	no	yes	VD
28	Chernihiv reservoir	UA_M6.9_0034	HMWB	at risk	risk-free	no	yes	TP, VD
29	Sisikulak	UA_M6.9_0039	HMWB	at risk	risk-free	no	yes	VD
30	Sisikulak	UA_M6.9_0040	PR	at risk	risk-free	no	yes	VD
31	Sisikulak	UA_M6.9_0041	HMWB	at risk	risk-free	no	yes	VD
32	Sisikulak	UA_M6.9_0042	PR	at risk	risk-free	no	yes	VD
33	Kainkula	UA_M6.9_0043	PR	at risk	risk-free	no	yes	VD
34	Novokazankuvate reservoir	UA_M6.9_0044	HMWB	at risk	risk-free	no	yes	TP, VD
35	Kainkula	UA_M6.9_0045	PR	at risk	risk-free	no	yes	VD
36	Kainkula	UA_M6.9_0046	HMWB	at risk	risk-free	no	yes	VD
37	Kainkula	UA_M6.9_0047	PR	at risk	risk-free	no	yes	VD
38	Chingul	UA_M6.9_0048	HMWB	at risk	risk-free	no	yes	VD
39	Chingul reservoir	UA_M6.9_0050	HMWB	at risk	risk-free	no	yes	TP, VD
40	Chingul	UA_M6.9_0051	PR	possibly at risk	risk-free	no	yes	VD
41	Kurkulak	UA_M6.9_0052	HMWB	at risk	risk-free	no	yes	VD
42	Kurkulak	UA_M6.9_0053	PR	possibly at risk	risk-free	no	yes	VD
43	Krulman	UA_M6.9_0054	HMWB	at risk	risk-free	no	yes	VD
44	Krulman	UA_M6.9_0055	PR	possibly at risk	risk-free	no	yes	VD
45	Krulman	UA_M6.9_0056	HMWB	at risk	risk-free	no	yes	VD
46	Krulman	UA_M6.9_0057	PR	at risk	risk-free	no	yes	VD
47	Oponli	UA_M6.9_0058	HMWB	at risk	risk-free	no	yes	VD
48	Kurushan	UA_M6.9_0059	PR	at risk	risk-free	no	yes	VD
49	Kurushan	UA_M6.9_0060	HMWB	at risk	risk-free	no	yes	VD
50	Yushanli	UA_M6.9_0061	PR	at risk	risk-free	no	yes	VD
51	Yushanli	UA_M6.9_0062	PR	at risk	risk-free	no	yes	VD
52	Yushanli	UA_M6.9_0063	HMWB	at risk	risk-free	no	yes	VD
53	Yushanlinskoye reservoir	UA_M6.9_0064	HMWB	at risk	risk-free	no	yes	TP, VD

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54	Yushanli	UA_M6.9_0065	HMWB	at risk	risk-free	no	yes	VD
55	Lagidnenskoye (Kirovskoye) reservoir	UA_M6.9_0066	HMWB	at risk	risk-free	no	yes	TP, VD
56	Yushanli	UA_M6.9_0067	PR	at risk	risk-free	no	yes	VD
57	Chukrak	UA_M6.9_0068	PR	at risk	risk-free	no	yes	VD
58	Arabic	UA_M6.9_0069	HMWB	at risk	risk-free	no	yes	VD
59	Arabic	UA_M6.9_0070	PR	at risk	risk-free	no	yes	VD
60	Arabic	UA_M6.9_0071	HMWB	at risk	risk-free	no	yes	VD
61	Arabic	UA_M6.9_0072	PR	at risk	risk-free	no	yes	VD
62	Dzhekelnya	UA_M6.9_0073	PR	possibly at risk	risk-free	no	yes	VD
63	Dzhekelnya	UA_M6.9_0074	HMWB	at risk	risk-free	no	yes	VD
64	Dzhekelnya	UA_M6.9_0075	PR	possibly at risk	risk-free	no	yes	VD
65	Domuzla (Domuzgla)	UA_M6.9_0076	PR	possibly at risk	risk-free	no	yes	VD
66	Domuzla (Domuzgla)	UA_M6.9_0077	HMWB	at risk	risk-free	no	yes	VD
67	Domuzla (Domuzgla)	UA_M6.9_0079	HMWB	at risk	risk-free	no	yes	VD
68	Domuzla (Domuzgla)	UA_M6.9_0080	PR	possibly at risk	risk-free	no	yes	VD
69	Domuzla (Domuzgla)	UA_M6.9_0081	HMWB	at risk	risk-free	no	yes	VD
70	Domuzla (Domuzgla)	UA_M6.9_0082	PR	possibly at risk	risk-free	no	yes	VD
71	Akchokrak	UA_M6.9_0083	PR	possibly at risk	risk-free	no	yes	VD
72	Akchokrak	UA_M6.9_0084	PR	possibly at risk	risk-free	no	yes	VD
73	Akchokrak	UA_M6.9_0085	HMWB	at risk	risk-free	no	yes	VD
74	Akchokrak	UA_M6.9_0086	HMWB	at risk	risk-free	no	yes	VD
75	Akchokrak	UA_M6.9_0087	PR	possibly at risk	risk-free	no	yes	VD
76	Korsak	UA_M6.9_0088	HMWB	at risk	risk-free	no	yes	VD
77	Korsak	UA_M6.9_0089	PR	at risk	risk-free	no	yes	VD
78	Metrology	UA_M6.9_0090	PR	possibly at risk	risk-free	no	yes	VD
79	Metrology	UA_M6.9_0091	PR	possibly at risk	risk-free	no	yes	VD
80	Apokny	UA_M6.9_0092	HMWB	at risk	risk-free	no	yes	VD
81	Apokny	UA_M6.9_0093	PR	possibly at risk	risk-free	no	yes	VD
82	Apokny	UA_M6.9_0094	PR	possibly at risk	risk-free	no	yes	VD
83	Lozovatka	UA_M6.9_0095	PR	at risk	risk-free	no	yes	VD
84	Lozovatka	UA_M6.9_0096	HMWB	at risk	risk-free	no	yes	VD
85	Lozovatka	UA_M6.9_0097	PR	at risk	risk-free	no	yes	VD
86	Lozovatka	UA_M6.9_0098	PR	at risk	risk-free	no	yes	VD
87	Kolarivske Reservoir	UA_M6.9_0099	HMWB	at risk	risk-free	no	yes	TP, VD
88	Lozovatka	UA_M6.9_0100	PR	at risk	risk-free	no	yes	VD
89	Vowed	UA_M6.9_0101	PR	at risk	risk-free	no	yes	VD
90	Vowed	UA_M6.9_0102	PR	at risk	risk-free	no	yes	VD
91	Vowed	UA_M6.9_0103	HMWB	at risk	risk-free	no	yes	VD
92	Vowed	UA_M6.9_0104	HMWB	at risk	risk-free	no	yes	VD
93	Vowed	UA_M6.9_0105	PR	at risk	risk-free	no	yes	VD
94	Vowed	UA_M6.9_0106	HMWB	at risk	risk-free	no	yes	VD

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95	Vowed	UA_M6.9_0107	PR	at risk	risk-free	no	yes	VD
96	Andriyivske Reservoir	UA_M6.9_0108	HMWB	at risk	risk-free	no	yes	TP, VD
97	Vowed	UA_M6.9_0109	PR	at risk	risk-free	no	yes	VD
98	Chokrak	UA_M6.9_0111	PR	at risk	risk-free	no	yes	VD
99	Chokrak	UA_M6.9_0112	HMWB	at risk	risk-free	no	yes	VD
100	Chokrak	UA_M6.9_0113	HMWB	at risk	risk-free	no	yes	VD
101	Chokrak	UA_M6.9_0114	PR	at risk	risk-free	no	yes	VD
102	Kiltychya	UA_M6.9_0115	PR	at risk	risk-free	no	yes	VD
103	Kiltychya	UA_M6.9_0116	HMWB	at risk	risk-free	no	yes	VD
104	Kiltychya	UA_M6.9_0117	PR	at risk	risk-free	no	yes	VD
105	Kiltychya	UA_M6.9_0118	HMWB	at risk	risk-free	no	yes	VD
106	Kiltychya	UA_M6.9_0119	PR	at risk	risk-free	no	yes	VD
107	Kiltychya	UA_M6.9_0120	PR	at risk	risk-free	no	yes	VD
108	Kiltychya	UA_M6.9_0121	HMWB	at risk	risk-free	no	yes	VD
109	Kiltychya	UA_M6.9_0122	PR	at risk	risk-free	no	yes	VD
110	Burtichya	UA_M6.9_0123	PR	at risk	risk-free	no	yes	VD
111	Burtichya	UA_M6.9_0124	HMWB	at risk	risk-free	no	yes	VD
112	Burtichya	UA_M6.9_0125	PR	at risk	risk-free	no	yes	VD
113	Burtichya	UA_M6.9_0126	HMWB	at risk	risk-free	no	yes	VD
114	Burtichya	UA_M6.9_0127	PR	at risk	risk-free	no	yes	VD
115	Sofiyivske (Zhovtnevske) reservoir	UA_M6.9_0128	HMWB	at risk	risk-free	no	yes	TP, VD
116	Burtichya	UA_M6.9_0129	PR	at risk	risk-free	no	yes	VD
117	Burtichya	UA_M6.9_0130	PR	at risk	risk-free	no	yes	VD
118	Burtchechyky Reservoir	UA_M6.9_0131	HMWB	at risk	risk-free	no	yes	TP, VD
119	Burtichya	UA_M6.9_0132	PR	at risk	risk-free	no	yes	VD
120	Salty	UA_M6.9_0133	PR	at risk	risk-free	no	yes	VD
121	Kutsa Berdianka	UA_M6.9_0134	PR	at risk	risk-free	no	yes	VD
122	Kutsa Berdianka	UA_M6.9_0135	PR	at risk	risk-free	no	yes	VD
123	Berda	UA_M6.9_0136	PR	at risk	risk-free	no	yes	VD
124	Berda	UA_M6.9_0137	PR	at risk	risk-free	no	yes	VD
125	Berda	UA_M6.9_0138	PR	at risk	risk-free	no	yes	VD
126	Berda	UA_M6.9_0139	PR	at risk	risk-free	no	yes	VD
127	Berdiansk reservoir	UA_M6.9_0140	HMWB	at risk	risk-free	no	yes	TP, VD
128	Berda	UA_M6.9_0141	PR	at risk	risk-free	no	yes	VD
129	Bilmanka	UA_M6.9_0142	PR	at risk	possibly at risk	no	no	VD, PP
130	Bilmanka	UA_M6.9_0143	PR	at risk	risk-free	no	yes	VD
131	Alekseevskoye Reservoir	UA_M6.9_0144	HMWB	at risk	risk-free	no	yes	TP, VD
132	Bilmanka	UA_M6.9_0145	PR	at risk	risk-free	no	yes	VD
133	Heavy	UA_M6.9_0146	PR	at risk	risk-free	no	yes	VD
134	Heavy	UA_M6.9_0147	PR	at risk	risk-free	no	yes	VD
135	Gruzka	UA_M6.9_0148	PR	at risk	risk-free	no	yes	VD

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136	Gruzka	UA_M6.9_0149	HMWB	at risk	risk-free	no	yes	VD
137	Gruzka	UA_M6.9_0150	PR	at risk	risk-free	no	yes	VD
138	Karatyuk	UA_M6.9_0151	HMWB	at risk	risk-free	no	yes	VD
139	Eastern reservoir	UA_M6.9_0152	HMWB	at risk	risk-free	no	yes	TP, VD
140	Karatyuk	UA_M6.9_0153	PR	at risk	risk-free	no	yes	VD
141	Bila Tserkva reservoir	UA_M6.9_0154	HMWB	at risk	risk-free	no	yes	TP, VD
142	Karatyuk	UA_M6.9_0155	PR	at risk	risk-free	no	yes	VD
143	Garden pond	UA_M6.9_0156	HMWB	at risk	risk-free	no	yes	VD
144	Karatyuk	UA_M6.9_0157	PR	at risk	risk-free	no	yes	VD
145	Zakharievske Reservoir	UA_M6.9_0158	HMWB	at risk	risk-free	no	yes	TP, VD
146	Karatyuk	UA_M6.9_0159	HMWB	at risk	risk-free	no	yes	VD
147	Temryuk	UA_M6.9_0160	PR	at risk	risk-free	no	yes	VD
148	Temryuk	UA_M6.9_0161	HMWB	at risk	risk-free	no	yes	VD
149	Temryuk	UA_M6.9_0162	PR	at risk	risk-free	no	yes	VD
150	Temryuk	UA_M6.9_0163	HMWB	at risk	risk-free	no	yes	VD
151	Temryuk	UA_M6.9_0164	PR	at risk	risk-free	no	yes	VD
152	Karate	UA_M6.9_0165	HMWB	at risk	risk-free	no	yes	VD
153	Karate	UA_M6.9_0166	HMWB	at risk	risk-free	no	yes	VD
154	Rozovka reservoir	UA_M6.9_0167	HMWB	at risk	risk-free	no	yes	TP, VD
155	Karate	UA_M6.9_0168	PR	at risk	risk-free	no	yes	VD
156	Karate	UA_M6.9_0169	HMWB	at risk	risk-free	no	yes	VD
157	Karate	UA_M6.9_0170	PR	at risk	risk-free	no	yes	VD
158	Karate	UA_M6.9_0171	PR	at risk	risk-free	no	yes	VD
159	Fedorivske Reservoir	UA_M6.9_0172	HMWB	at risk	risk-free	no	yes	TP, VD
160	Karate	UA_M6.9_0173	PR	possibly at risk	risk-free	no	yes	VD
161	Starodubivske Reservoir	UA_M6.9_0174	HMWB	at risk	risk-free	no	yes	TP, VD
162	Karate	UA_M6.9_0175	PR	possibly at risk	risk-free	no	yes	VD
163	Untitled	UA_M6.9_0176	PR	at risk	risk-free	no	yes	VD
164	Untitled	UA_M6.9_0177	HMWB	at risk	risk-free	no	yes	VD
165	Untitled	UA_M6.9_0178	PR	at risk	risk-free	no	yes	VD
166	Water	UA_M6.9_0179	HMWB	at risk	risk-free	no	yes	VD
167	Water	UA_M6.9_0180	HMWB	at risk	risk-free	no	yes	VD
168	Water	UA_M6.9_0181	PR	at risk	risk-free	no	yes	VD
169	Romanivske Reservoir	UA_M6.9_0182	HMWB	at risk	risk-free	no	yes	TP, VD
170	Water	UA_M6.9_0183	PR	at risk	risk-free	no	yes	VD
171	Water	UA_M6.9_0184	PR	at risk	risk-free	no	yes	VD
172	Salty	UA_M6.9_0185	PR	at risk	risk-free	no	yes	VD
173	Berestova	UA_M6.9_0186	PR	at risk	risk-free	no	yes	VD
174	Berestova	UA_M6.9_0187	HMWB	at risk	risk-free	no	yes	VD
175	Berestova	UA_M6.9_0188	PR	at risk	risk-free	no	yes	VD
176	Green	UA_M6.9_0189	HMWB	at risk	risk-free	no	yes	VD
177	Primorskoye Reservoir	UA_M6.9_0190	HMWB	at risk	risk-free	no	yes	TP, VD

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178	Green	UA_M6.9_0191	PR	possibly at risk	risk-free	no	yes	VD
179	Komyshuvatka	UA_M6.9_0192	PR	possibly at risk	risk-free	no	yes	VD
180	Komyshuvatka	UA_M6.9_0193	HMWB	at risk	risk-free	no	yes	VD
181	Komyshuvatka	UA_M6.9_0194	PR	possibly at risk	risk-free	no	yes	VD
182	Komyshuvatka	UA_M6.9_0195	HMWB	at risk	risk-free	no	yes	VD
183	Komyshuvatka	UA_M6.9_0196	PR	possibly at risk	risk-free	no	yes	VD
184	Komyshuvatka	UA_M6.9_0197	PR	possibly at risk	risk-free	no	yes	VD
185	Komyshuvatka	UA_M6.9_0198	HMWB	at risk	risk-free	no	yes	VD
186	Komyshuvatka	UA_M6.9_0199	HMWB	at risk	risk-free	no	yes	VD
187	Komyshuvatka	UA_M6.9_0200	PR	possibly at risk	risk-free	no	yes	VD
188	Wet Belosarayskaya	UA_M6.9_0201	HMWB	at risk	risk-free	no	yes	VD
189	Wet Belosarayskaya	UA_M6.9_0202	HMWB	at risk	risk-free	no	yes	VD
190	Kalmius	UA_M6.9_0203	PR	at risk	possibly at risk	no	no	VD
191	V. Kalmius reservoir	UA_M6.9_0204	HMWB	at risk	risk-free	no	yes	TP, VD
192	Kalmius	UA_M6.9_0205	PR	possibly at risk	risk-free	no	yes	VD
193	Nizhnekalmiuskoye reservoir	UA_M6.9_0207	HMWB	at risk	risk-free	no	yes	TP, VD
194	Starobeshevo reservoir	UA_M6.9_0210	HMWB	at risk	risk-free	no	yes	TP, VD
195	Pavlopilsk reservoir	UA_M6.9_0212	HMWB	at risk	risk-free	no	yes	TP, VD
196	Kalmius	UA_M6.9_0213	PR	at risk	possibly at risk	no	no	VD, PP, TP, BB
197	Donetsk reservoir	UA_M6.9_0215	HMWB	at risk	risk-free	no	yes	TP, VD
198	Bogodukhova	UA_M6.9_0217	HMWB	at risk	risk-free	no	yes	VD
199	Bogodukhova	UA_M6.9_0218	HMWB	at risk	risk-free	no	yes	VD
200	Gruzka	UA_M6.9_0220	PR	possibly at risk	risk-free	no	yes	VD
201	Gruzka	UA_M6.9_0221	HMWB	at risk	risk-free	no	yes	VD
202	Kalinova	UA_M6.9_0224	PR	possibly at risk	risk-free	no	yes	VD
203	Kalinova	UA_M6.9_0225	PR	possibly at risk	risk-free	no	yes	VD
204	Kalinova	UA_M6.9_0226	HMWB	at risk	risk-free	no	yes	VD
205	Kalinova	UA_M6.9_0227	PR	possibly at risk	risk-free	no	yes	VD
206	Kolesnikova	UA_M6.9_0228	HMWB	at risk	risk-free	no	yes	VD
207	BAM reservoir	UA_M6.9_0230	HMWB	at risk	risk-free	no	yes	TP, VD
208	Kolesnikova	UA_M6.9_0231	PR	possibly at risk	risk-free	no	yes	VD
209	B. Acidic	UA_M6.9_0232	HMWB	at risk	risk-free	no	yes	VD
210	Oleksandrivske Reservoir	UA_M6.9_0235	HMWB	at risk	risk-free	no	yes	TP, VD
211	Komyshuvakha	UA_M6.9_0238	HMWB	at risk	risk-free	no	yes	VD
212	Loikova	UA_M6.9_0240	HMWB	at risk	risk-free	no	yes	VD
213	Loikova	UA_M6.9_0242	HMWB	at risk	risk-free	no	yes	VD
214	Mykolaiv reservoir	UA_M6.9_0246	HMWB	at risk	risk-free	no	yes	TP, VD
215	Stilske reservoir	UA_M6.9_0248	HMWB	at risk	risk-free	no	yes	TP, VD
216	Dry Volnovakha	UA_M6.9_0252	HMWB	at risk	possibly at risk	no	yes	VD
217	Olenivske Reservoir	UA_M6.9_0256	HMWB	at risk	risk-free	no	yes	VD
218	Dokuchaevskoye reservoir	UA_M6.9_0258	HMWB	at risk	risk-free	no	yes	TP, VD

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219	Balmatour	UA_M6.9_0261	HMWB	at risk	risk-free	no	yes	VD
220	Kamyshevakhskoye reservoir	UA_M6.9_0264	HMWB	at risk	risk-free	no	yes	TP, VD
221	Staroignativske reservoir	UA_M6.9_0268	HMWB	at risk	risk-free	no	yes	TP, VD
222	Kamianske Reservoir	UA_M6.9_0272	HMWB	at risk	risk-free	no	yes	TP, VD
223	Granite reservoir	UA_M6.9_0275	HMWB	at risk	risk-free	no	yes	TP, VD
224	Calculator	UA_M6.9_0281	HMWB	at risk	risk-free	no	yes	VD
225	Calculator	UA_M6.9_0282	PR	possibly at risk	risk-free	no	yes	VD
226	Calculator	UA_M6.9_0283	HMWB	at risk	risk-free	no	yes	VD
227	Calculator	UA_M6.9_0284	PR	possibly at risk	risk-free	no	yes	VD
228	Calculator	UA_M6.9_0285	HMWB	at risk	risk-free	no	yes	VD
229	Calculator	UA_M6.9_0286	PR	possibly at risk	possibly at risk	no	no	VD
230	Calculator	UA_M6.9_0287	HMWB	at risk	risk-free	no	yes	VD
231	Calculator	UA_M6.9_0288	PR	possibly at risk	risk-free	no	yes	VD
232	Staro-Krymske Reservoir	UA_M6.9_0289	HMWB	at risk	risk-free	no	yes	TP, VD
233	Calculator	UA_M6.9_0290	PR	at risk	possibly at risk	no	no	VD, PP, TP, BB
234	Kalmycka	UA_M6.9_0291	PR	possibly at risk	risk-free	no	yes	VD
235	b. Gruzka	UA_M6.9_0292	PR	possibly at risk	risk-free	no	yes	VD
236	Znamenskoye reservoir	UA_M6.9_0294	HMWB	at risk	risk-free	no	yes	TP, VD
237	b. Veli Tarama	UA_M6.9_0295	PR	risk-free	possibly at risk	no	no	VD
238	b. Veli Tarama	UA_M6.9_0296	PR	possibly at risk	risk-free	no	yes	VD
239	Regimental	UA_M6.9_0298	HMWB	at risk	risk-free	no	yes	VD
240	Regimental	UA_M6.9_0299	PR	possibly at risk	risk-free	no	yes	VD
241	Little Kalchik	UA_M6.9_0301	HMWB	at risk	risk-free	no	yes	VD
242	Little Kalchik	UA_M6.9_0302	PR	at risk	possibly at risk	no	yes	VD
243	Donskoy reservoir	UA_M6.9_0303	HMWB	at risk	risk-free	no	yes	VD
244	Anadolsk reservoir	UA_M6.9_0305	HMWB	at risk	risk-free	no	yes	TP, VD
245	Little Kalchik	UA_M6.9_0307	HMWB	at risk	risk-free	no	yes	VD
246	Kirovskoye reservoir	UA_M6.9_0308	HMWB	at risk	risk-free	no	yes	TP, VD
247	Little Kalchik	UA_M6.9_0309	PR	at risk	possibly at risk	no	no	VD
248	Kalets	UA_M6.9_0310	PR	at risk	risk-free	no	yes	VD
249	Kalets	UA_M6.9_0311	HMWB	at risk	risk-free	no	yes	VD
250	Kalets	UA_M6.9_0312	PR	at risk	risk-free	no	yes	VD
251	Kalets	UA_M6.9_0313	PR	at risk	risk-free	no	yes	VD
252	The victorious reservoir	UA_M6.9_0314	HMWB	at risk	risk-free	no	yes	TP, VD
253	Kalets	UA_M6.9_0315	PR	at risk	risk-free	no	yes	VD
254	Wide	UA_M6.9_0317	HMWB	at risk	risk-free	no	yes	VD
255	Kumachevskoye reservoir	UA_M6.9_0323	HMWB	at risk	risk-free	no	yes	TP, VD
256	Gruzky Elanchik	UA_M6.9_0325	HMWB	at risk	risk-free	no	yes	VD
257	Shevchenkivske III reservoir	UA_M6.9_0327	HMWB	at risk	risk-free	no	yes	TP, VD

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258	Shevchenkivske II reservoir	UA_M6.9_0328	HMWB	at risk	risk-free	no	yes	TP, VD
259	Gruzky Elanchik	UA_M6.9_0329	HMWB	at risk	risk-free	no	yes	VD
260	Mikhailovskoye I reservoir	UA_M6.9_0331	HMWB	at risk	risk-free	no	yes	TP, VD
261	Kamenka	UA_M6.9_0336	HMWB	at risk	risk-free	no	yes	VD
262	Mikhailovsky reservoir	UA_M6.9_0338	HMWB	at risk	risk-free	no	yes	TP, VD
263	Stony	UA_M6.9_0341	HMWB	at risk	risk-free	no	yes	VD
264	Slide	UA_M6.9_0347	HMWB	at risk	risk-free	no	yes	VD
265	Slide	UA_M6.9_0350	HMWB	at risk	risk-free	no	yes	VD
266	Khartsyzsk	UA_M6.9_0352	PR	at risk	possibly at risk	no	no	VD
267	Wet Elanchik	UA_M6.9_0355	PR	at risk	possibly at risk	no	no	VD
268	Kisilovskoye reservoir	UA_M6.9_0356	HMWB	at risk	risk-free	no	yes	TP, VD
269	Dry Elanchik	UA_M6.9_0360	HMWB	at risk	risk-free	no	yes	VD
270	Novoivanivske reservoir	UA_M6.9_0362	HMWB	at risk	risk-free	no	yes	TP, VD
271	Ulyanovsk reservoir	UA_M6.9_0365	HMWB	at risk	risk-free	no	yes	TP, VD
272	Grabivske Reservoir	UA_M6.9_0370	HMWB	at risk	risk-free	no	yes	TP, VD
273	Mius	UA_M6.9_0371	PR	at risk	possibly at risk	no	no	VD
274	Shterivske reservoir	UA_M6.9_0372	HMWB	at risk	risk-free	no	yes	TP, VD
275	Mius	UA_M6.9_0373	PR	at risk	possibly at risk	no	no	VD
276	Miusik	UA_M6.9_0377	PR	at risk	possibly at risk	no	no	VD
277	Yanivske Reservoir	UA_M6.9_0378	HMWB	at risk	risk-free	no	yes	TP, VD
278	Grooves	UA_M6.9_0380	PR	at risk	possibly at risk	no	no	VD
279	Grooves	UA_M6.9_0381	PR	at risk	possibly at risk	no	no	VD
280	Deaf	UA_M6.9_0383	PR	at risk	possibly at risk	no	no	VD
281	Kripenka	UA_M6.9_0387	PR	at risk	possibly at risk	no	no	VD
282	Naked	UA_M6.9_0390	PR	at risk	possibly at risk	no	no	VD
283	Naked	UA_M6.9_0392	HMWB	at risk	risk-free	no	yes	VD
284	Platonivske Reservoir	UA_M6.9_0395	HMWB	at risk	risk-free	no	yes	TP, VD
285	Naked	UA_M6.9_0396	PR	at risk	possibly at risk	no	no	VD
286	Blagovske Reservoir	UA_M6.9_0399	HMWB	at risk	risk-free	no	yes	TP, VD
287	Rovenok	UA_M6.9_0401	PR	at risk	possibly at risk	no	no	VD
288	Rovenky reservoir	UA_M6.9_0404	HMWB	at risk	risk-free	no	yes	TP, VD
289	Verbovske Reservoir	UA_M6.9_0406	HMWB	at risk	risk-free	no	yes	TP, VD
290	Vyshnevetska	UA_M6.9_0410	PR	at risk	possibly at risk	no	no	VD
291	Vyshnevetska	UA_M6.9_0411	PR	at risk	possibly at risk	no	no	VD
292	Nagolchanskoye reservoir	UA_M6.9_0413	HMWB	at risk	risk-free	no	yes	TP, VD
293	Kosharske reservoir	UA_M6.9_0417	HMWB	at risk	risk-free	no	yes	TP, VD
294	Yuskin	UA_M6.9_0418	PR	at risk	possibly at risk	no	no	VD
295	Headband	UA_M6.9_0422	PR	at risk	possibly at risk	no	no	VD
296	Anthracite reservoir	UA_M6.9_0423	HMWB	at risk	risk-free	no	yes	TP, VD
297	Headband	UA_M6.9_0425	HMWB	at risk	risk-free	no	yes	VD
298	Dubrovka	UA_M6.9_0427	HMWB	at risk	risk-free	no	yes	VD

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299	Dubrovka	UA_M6.9_0429	HMWB	at risk	risk-free	no	yes	VD
300	Khanzhenkivske reservoir	UA_M6.9_0435	HMWB	at risk	risk-free	no	yes	TP, VD
301	Zuevskoye reservoir	UA_M6.9_0438	HMWB	at risk	risk-free	no	yes	VD
302	Krinka	UA_M6.9_0439	PR	at risk	possibly at risk	no	no	VD
303	Volynets Reservoir	UA_M6.9_0443	HMWB	at risk	risk-free	no	yes	TP, VD
304	Bulavin	UA_M6.9_0445	HMWB	at risk	risk-free	no	yes	VD
305	Olkhovatka	UA_M6.9_0448	HMWB	at risk	risk-free	no	yes	VD
306	Olkhovatka	UA_M6.9_0450	PR	at risk	possibly at risk	no	no	VD
307	Gardens	UA_M6.9_0451	PR	at risk	possibly at risk	no	no	VD
308	Yenakiieve reservoir	UA_M6.9_0453	HMWB	at risk	risk-free	no	yes	TP, VD
309	Korsun	UA_M6.9_0456	PR	possibly at risk	risk-free	no	yes	VD
310	Korsun	UA_M6.9_0457	HMWB	at risk	risk-free	no	yes	VD
311	Korsun	UA_M6.9_0459	HMWB	at risk	risk-free	no	yes	VD
312	Dewlap	UA_M6.9_0462	PR	possibly at risk	risk-free	no	yes	VD
313	Dewlap	UA_M6.9_0464	HMWB	at risk	risk-free	no	yes	VD
314	Alder	UA_M6.9_0466	PR	at risk	risk-free	no	yes	VD
315	Alder	UA_M6.9_0467	HMWB	at risk	possibly at risk	no	no	VD
316	Olkhovskoye reservoir	UA_M6.9_0471	HMWB	at risk	risk-free	no	yes	TP, VD
317	Alder	UA_M6.9_0472	PR	at risk	possibly at risk	no	no	VD
318	Khartsyzsk	UA_M6.9_0474	HMWB	at risk	risk-free	no	yes	VD
319	Khartsyzsk	UA_M6.9_0476	HMWB	at risk	risk-free	no	yes	VD
320	Khartsyzsk	UA_M6.9_0477	PR	at risk	possibly at risk	no	no	VD
321	Olkhovka	UA_M6.9_0480	HMWB	at risk	risk-free	no	yes	VD
322	Olkhovka	UA_M6.9_0482	HMWB	at risk	risk-free	no	yes	VD
323	Bolshaya Sklyovaya	UA_M6.9_0484	HMWB	at risk	risk-free	no	yes	VD
324	Orlovka	UA_M6.9_0486	PR	at risk	possibly at risk	no	no	VD
325	Sevastianivka	UA_M6.9_0491	PR	at risk	risk-free	no	yes	VD
326	Manuylivske I reservoir	UA_M6.9_0493	HMWB	at risk	risk-free	no	yes	TP, VD
327	Orlova	UA_M6.9_0497	PR	at risk	risk-free	no	yes	VD
328	Semenivske II reservoir	UA_M6.9_0501	HMWB	at risk	risk-free	no	yes	TP, VD
329	Semenivske I reservoir	UA_M6.9_0502	HMWB	at risk	risk-free	no	yes	TP, VD
330	Kalinova I	UA_M6.9_0505	HMWB	at risk	risk-free	no	yes	VD
331	Kalinova II	UA_M6.9_0507	HMWB	at risk	risk-free	no	yes	VD
332	Kalinova II	UA_M6.9_0508	HMWB	at risk	risk-free	no	yes	VD
333	P-2 channel	UA_M6.9_0512	AWB	risk-free	possibly at risk	no	no	VD, TP
334	P-9 channel	UA_M6.9_0515	AWB	possibly at risk	risk-free	no	yes	VD, TP
335	Lake. Lake Overianivske	UA_M6.9_0516	PR	at risk	risk-free	no	yes	VD, PP
336	Lake. Zyablovske Lake	UA_M6.9_0517	PR	at risk	risk-free	no	yes	VD, PP
337	Bulk storage reservoir	UA_M6.9_0518	AWB	at risk	risk-free	no	yes	TP, VD
338	Lake. Bakai Lake	UA_M6.9_0519	AWB	at risk	risk-free	no	yes	VD, PP, TP
339	Bulk storage reservoir	UA_M6.9_0520	AWB	at risk	risk-free	no	yes	VD, TP
340	Bulk storage reservoir	UA_M6.9_0521	AWB	at risk	risk-free	no	yes	VD, TP

№	Title SWB	Code SWB	Category (PR, HMWB/AWB)[46]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental objectives, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[47]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
341	Bulk storage reservoir	UA_M6.9_0522	AWB	at risk	risk-free	no	yes	VD, TP
342	Bulk storage reservoir	UA_M6.9_0523	AWB	at risk	risk-free	no	yes	VD, TP
343	Bulk storage reservoir	UA_M6.9_0524	AWB	at risk	risk-free	no	yes	VD, TP
344	Bulk storage reservoir	UA_M6.9_0525	AWB	at risk	risk-free	no	yes	VD, TP
345	Bulk storage reservoir	UA_M6.9_0526	AWB	at risk	risk-free	no	yes	VD, TP
346	Tank for salt production	UA_M6.9_0527	AWB	at risk	risk-free	no	yes	VD, TP
347	Sump	UA_M6.9_0528	AWB	at risk	risk-free	no	yes	VD, TP
348	Kryvokiska estuary	UA_M6.9_0529	PR	at risk	risk-free	no	yes	VD, PP
349	Lake. Dovhe	UA_M6.9_0530	PR	at risk	risk-free	no	yes	VD, PP
350	Lake. Dovhe	UA_M6.9_0531	PR	at risk	risk-free	no	yes	VD, PP
351	An estuary with no name	UA_M6.9_0532	PR	at risk	risk-free	no	yes	VD, PP
352	Great estuary	UA_M6.9_0533	PR	at risk	risk-free	no	yes	VD, PP
353	Bolgrad Sivashik estuary	UA_M6.9_0534	PR	at risk	risk-free	no	yes	VD, PP
354	Lake. Liman	UA_M6.9_0535	PR	at risk	risk-free	no	yes	VD, PP
355	Lake. Sokolovskoye Lake	UA_M6.9_0536	PR	at risk	risk-free	no	yes	VD, PP
356	Lake. Lake Kruglyak	UA_M6.9_0537	PR	at risk	risk-free	no	yes	VD, PP
357	Molochny estuary	UA_M6.9_0538	PR	at risk	risk-free	no	yes	VD
358	Sivash Bay	UA_M6.9_0540	PR	at risk	risk-free	no	yes	VD
359	Stare Lake	UA_M6.9_0541	PR	at risk	risk-free	no	yes	VD
360	Lake Krasne	UA_M6.9_0542	PR	at risk	risk-free	no	yes	VD
361	Lake Kyatske	UA_M6.9_0543	PR	at risk	risk-free	no	yes	VD
362	Lake Kirleutskoye	UA_M6.9_0544	PR	at risk	risk-free	no	yes	VD
363	Lake. Lake Aigulskoye	UA_M6.9_0545	PR	at risk	risk-free	no	yes	VD
364	Sivash Bay	UA_M6.9_0546	PR	at risk	risk-free	no	yes	VD
365	Sivash Bay	UA_M6.9_0547	PR	at risk	possibly at risk	no	no	VD
366	Lake Genicheske	UA_M6.9_0548	PR	at risk	risk-free	no	yes	VD
367	Lake. Lake Tobechytske	UA_M6.9_0549	PR	at risk	risk-free	no	yes	VD
368	Azov	UA_M6.9_0551	PR	at risk	possibly at risk	no	no	VD
369	Azov	UA_M6.9_0552	PR	at risk	possibly at risk	no	no	VD
370	Azov	UA_M6.9_0553	PR	at risk	possibly at risk	no	no	VD
371	Azov	UA_M6.9_0554	PR	at risk	possibly at risk	no	no	VD
372	Azov	UA_M6.9_0555	PR	at risk	possibly at risk	no	no	VD

Table 2. Environmental objectives for GWBs and their groups

№	GWB code	Name of the GWB	Quantitative state		Chemical state		Reason for the postponement[48]	Reason for setting less stringent targets[49]	Notes[50]
			Objective	**Timeframe for achievement**	**Objective**	**Timeframe for achievement**			
1	2	3	4	5	6	7	8	9	10
Non-pressure GWB and groups of non-pressure GWB									
1	UAM6900Q100	Group of GWBs in alluvial quaternary sediments	Good condition	2042	Good condition	2042	T,S	NA	EO
2	UAM6900Q200	Group of GWBs in marine and estuarine sediments	Good condition	2030	Good condition	2042	T, S	NA	EO
3	UAM6900Q300	GWBs in deluvial estuarine and marine sediments	Good condition	2030	Good condition	2042	T, S	NA	EO
4	UAM6900Q400	A group of GWBs in aeolian-deluvial Quaternary sediments	Good condition	2030	Good condition	2042	T, S	NA	EO
Pressure GWB and groups of pressure GWB									
5	UAM6900N200	Group of GWBs in Pliocene terrigenous sediments	Good condition	2030	Good condition	2030			EO
6	UAM6900N100	A group of GWBs in Upper Miocene terrigenous carbonate sediments	Good condition	2030	Good condition	2030			EO
7	UAM690PG100	Group of GWBs in Paleocene and Eocene sediments	Good condition	2030	Good condition	2030			EO
8	UAM690PG200	Group of GWBs in the Bachak terrigenous sediments of the Eocene	Good condition	2042	Good condition	2030			EO
9	UAM6900K300	Group of GWBs in terrigenous deposits of the Upper Cretaceous (Molochna River basin)	Good condition	2030	Good condition	2030			EO

48 T - technical reasons, H - disproportionately high cost, S - existing natural state

49 not applicable (NA) in the first cycle of the RBMP 2025-2030

50 RCA - risk assessment of failure to achieve good status, ES - ecological status according to monitoring data, CS - chemical status according to monitoring data, EO - expert assessment

№	GWB code	Name of the GWB	Quantitative state		Chemical state		Reason for the postponement[48]	Reason for setting less stringent targets[49]	Notes[50]
			Objective	**Timeframe for achievement**	**Objective**	**Timeframe for achievement**			
10	UAM6900K200	Group of GWBs in terrigenous deposits of the Upper Cretaceous (Krynka River basin)	Good condition	2042	Good condition	2030			EO
11	UAM6900K100	Group of GWBs in Lower Cretaceous terrigenous sediments	Good condition	2030	Good condition	2030			EO
12	UAM6900C200	Group of GWBs in the sandy-clayey strata of coal deposits	Good condition	2042	Good condition	2030			EO
13	UAM6900C100	Group of GWBs in the Lower Carboniferous limestone-dolomite formation	Good condition	2030	Good condition	2030			EO
14	UAM6900D100	GWBs in Devonian sediments	Good condition	2030	Good condition	2030			EO
15	UAM690AR100	Group of GWBs in the fracture zone of crystalline rocks of the Archean-Proterozoic	Good condition	2030	Good condition	2030			EO

Annex 9.1. Characteristics of water use in the Azov river basin[51]

Name of economic sectors	The volume of water intake, million m^3	Volume of water used, million $m3^3$	Share of total water withdrawal within the river of the basin %.
Industry	**550,6**	**571,7**	**44,55**
including energy	0,001	0,012	
ferrous metallurgy	549,7	570,4	
food industry	0,353	0,842	
coal industry	-	0,010	
forestry woodworking	-	0,001	
pulp and paper	-	-	
chemical and petrochemical	-	0,006	
chemical industry	-	-	
fuel industry	-	-	
oil refining industry	-	-	
gas industry	-	-	
Housing and utilities	**99,2**	**103,6**	**8,03**
Agriculture	**584,3**	**537,9**	**47,27**
including fisheries	11,03	0,004	
irrigation	567,8	531,3	
agricultural enterprises (ksp)	3,946	5,000	
Transport	**0,121**	**0,368**	**0,01**
Forestry	**0,016**	**0,017**	**0,001**
Other	1,763	1,415	0,14
Total for the Azov river basin area	**1236,0**	**1215,0**	**100 %**

[51] Data source: State water cadastre data, section "Water use", 2019, State Agency of Water Resources of Ukraine

Annex 9.2 Wastewater discharges to water bodies by categories of discharged water

Name of economic sectors	Volume of water discharged, million m^3	including			Share of total discharge within the river of the basin %.
		contaminated	normatively clean without cleansing	Regulatory treatment at facilities	
Industry	**539,9**	**0,078**	**379,8**	**152,2**	**88,68**
including energy	-	-	-	-	
ferrous metallurgy	539,3	-	379,7	152,0	
food industry	0,072	0,064	0,009	-	
coal industry	-	-	-	-	
Forestry, woodworking and pulp and paper	-	-	-	-	
chemical and petrochemical	-	-	-	-	
chemical industry	-	-	-	-	
fuel industry	-	-	-	-	
oil refining industry	-	-	-	-	
gas industry	-	-	-	-	
Housing and communal services household economy	**66,25**	**34,03**	**0,725**	**31,50**	**10,88**
Agriculture	**2,355**	**-**	**2,355**	**-**	**0,39**
including fisheries	-	-	-	-	
irrigation	2,355	-	2,355	-	
agricultural enterprises (ksp)	-	-	-	-	
Transport	**0,164**	**0,036**	**0,020**	**0,1**	**0,03**
Forestry	**-**	**-**	**-**	**-**	**-**
Other	0,131	0,056	-	-	**0,02**
Total for the basin area rivers of the Azov region	**608,8**	**34,20**	**382,9**	**183,8**	**100**

Annex 10 List of national targeted programmes, regional and local programmes, funds, state investment projects, international technical assistance projects, regional and local infrastructure projects, etc.

Name of the programme/fund/project	"The national target programme of development water economy and environmental rehabilitation of the Dnipro River basin for the period up to 2021"
Name of the conservation measure	Ensuring the development of land reclamation and improvement of the environmental condition of irrigated and of drained land.
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№2: Pollution by nutrients. №7: Issues related to the relationship between water quantity and quality in relation to climate change. №9. Droughts and water shortages.
Implementation of environmental protection measures and their financing	The Dnipro-2021 Programme provided for the implementation of measures to ensure the development of land reclamation and improve the environmental condition of irrigated and drained land in the amount of UAH 30090.49 million for the entire period of implementation from 2013 to 2021 (9 years). This measure was intended to continue the implementation of the previously existing state target programme "Comprehensive Programme for the Development of Land Reclamation and Improvement of the Ecological Condition of Irrigated and Drained Lands in 2001-2005 and Forecast to 2010". The event was to ensure the development of land reclamation and improvement of the ecological condition of irrigated and drained lands, including the restoration of the water management and reclamation complex, reconstruction and modernisation of reclamation systems and their facilities, engineering infrastructure of reclamation systems with the creation of integrated technological complexes, introduction of new methods of irrigation and land drainage, application of water and energy-saving environmentally safe irrigation and water regulation regimes. The planned action was implemented over 9 years, in two stages: 2013-2016 and 2017-2021. Since the start of the Dnipro-2021 Programme, as of 1 January 2019, 26% of the envisaged need has been allocated from budgets of all levels and other sources, and as of 1 January 2020, UAH 5115.383 million (17%) has been allocated, which has led to a significant failure to complete its tasks and activities on time. Low levels of actual funding for tasks and activities from all sources of funding.
Achieving the goals set	The targets were not achieved. The reason for this is the low amount of actual funding for tasks and activities from all sources of funding.
Name of the programme/fund/project	"The national target programme of development water economy and environmental rehabilitation of the Dnipro River basin for the period up to 2021"
Name of the conservation measure	Priority provision of centralised water supply to rural resident points that use imported water.
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№7. Issues related to the relationship between water quantity and quality in relation to climate change. №9. Droughts and water shortages.
Implementation of environmental protection measures and their financing	The Dnipro-2021 Programme provided funding for the measure in the amount of UAH 1668.6 million for the entire period of implementation from 2013 to 2021 (9 years). This event was a continuation of the implementation of the state target programme "Comprehensive Programme for Priority Provision of Rural Settlements Using Imported Water with Centralised Water Supply in 2001-2005 and Forecast to 2010". The event was supposed to improve the technological level of water use, introduce low-water and waterless technologies, develop more rational water use standards, build, reconstruct and modernise water supply systems, and provide Ukrainian settlements that used imported water with drinking water in sufficient quantity and of appropriate quality. The implementation of the planned event was carried out over 9 years, in two stages: 2013-2016 and 2017-2021.

	Since the start of the Dnipro-2021 Programme's activities, as of 1 January 2020, the state budget has allocated UAH 283.6 million of the envisaged need, which has led to a significant failure to complete its tasks and activities on time. For example, in 2020, the State Agency of Water Resources of Ukraine used a total of UAH 205,000.0 thousand (4.2% of the total expenditures for 2020)
Achieving the goals set	The set goals were not achieved. The reason for this is the low amount of actual funding for the tasks and measures from all sources of funding.
Name of the programme/fund/project	"National Target Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin for the Period up to 2021"
Name of the conservation measure	Protecting rural settlements and agricultural land from the harmful effects of water
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	No. 5 Hydromorphological changes. No. 7 Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories.
Implementation of environmental protection measures and their financing	The Dnipro-2021 Programme envisaged allocating UAH 1571.48 million for the implementation of measures to protect rural settlements and agricultural land from the harmful effects of water for the entire period of implementation from 2013 to 2021 (9 years). This measure was intended to continue the implementation of the previously existing "Comprehensive Programme for Protection against Harmful Effects of Water from Rural Settlements and Agricultural Lands in Ukraine in 2001-2005 and Forecast to 2010". The event included work on bank protection and regulation of river channels, construction and reconstruction of hydraulic structures, protective dams, polders, flood control reservoirs, clearing river channels, arranging water protection zones and coastal protection strips, developing schemes for comprehensive flood protection of territories from the harmful effects of water, improving methods and technical devices for hydrometeorological observations and flood forecasting. The implementation of the planned event was carried out over 9 years, in two stages: 2013-2016 and 2017-2021. Since the start of the Dnipro-2021 Programme, as of 1 January 2020, UAH 267.152 million (17%) of the envisaged amount has been allocated from budgets of all levels and other sources.
Achieving the goals set	The set goals were not achieved. The reason for this is the low amount of actual funding for tasks and activities from all sources of funding.
Name of the programme/fund/project	"The national target programme of development water economy and environmental rehabilitation of the Dnipro River basin for the period up to 2021"
Name of the conservation measure	Operation of the state water management complex and management of water resources resources, including environmental rehabilitation of the Dnipro River basin and improvement of drinking water quality
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	No. 1 Organic pollution. №2. Pollution by nutrients. №3. Pollution by hazardous substances. №5. Hydromorphological changes. №6. Spread of invasive species. No. 7: Issues related to the relationship between water quantity and quality in relation to climate change. №9. Droughts and water shortages.
Implementation of environmental protection measures and their financing	The event was implemented over 9 years, in two stages: 2013-2016 and 2017-2021. Stage 2 is particularly noteworthy, during which it was planned to: introduce a system of integrated water resources management based on the basin principle by developing and implementing river basin management plans, applying an economic model of targeted financing of activities in river basins, establishing river basin councils, as well as increasing the role of existing and establishing new basin water resource management departments; implement water-saving technologies that ensure the improvement of the functioning of the water management and reclamation complex;

	Since the beginning of the Dnipro-2021 Programme, as of 1 January 2019, 26% of the envisaged need has been allocated from budgets of all levels and other sources, and as of 1 January 2020, 17% has been allocated. State funds are allocated mainly for the costs of consumption in the water sector, labour remuneration, and utilities, the share of which was financed from the state budget in 2020, for example: from the general fund - 93.5% (UAH 2092158.5 thousand), from the special fund - 81.1% (UAH 2261343.4 thousand). Total state budget expenditures for financing the Dnipro 2021 Programme in 2020 amounted to UAH 5022671.0 thousand. The lion's share of all funds was used for the operation of the state water management complex and water resources management - UAH 4,561,352.5 thousand (90.8%). Total expenditures on the water sector in 2020 amounted to UAH 435,3501.9 thousand (86.7%) of total expenditures. At the same time, UAH 144620 thousand was allocated from the state fund and UAH 524549.1 thousand from the special fund for the development of the water sector, which is a total of amounted to UAH 669169.1 thousand (13.3%) of the expenditures for the entire Programme.
Achieving the goals set	The targets were partially achieved. The reason for this is the low amount of actual funding for tasks and activities from all sources of funding.
Name of the programme/fund/project	The National Target Programme "Drinking Water of Ukraine for 2011-2020"
Name of the conservation measure	Implementation of the state policy on development and reconstruction of centralised water supply and sewerage systems; protection of drinking water sources; bringing the quality of drinking water to the requirements of regulatory acts; regulatory support in the field of drinking water supply and sewerage; development and implementation of research and development developments using the latest materials, technologies, equipment and devices
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	No. 1 Organic pollution. №2. Pollution by nutrients. №3. Pollution by hazardous substances. №5. Hydromorphological changes. №6. Spread of invasive species. No. 7: Issues related to the relationship between water quantity and quality in relation to climate change. №9. Droughts and water shortages.
Implementation of environmental protection measures and their financing	The estimated amount of funding for the Programme was UAH 9,471.7 million (in 2010 prices), of which UAH 3,004.3 million was allocated from the state budget and UAH 6,467.4 million from other sources. Main objectives of the Programme: Bringing sanitary protection zones and water protection zones of drinking water sources into compliance with regulatory requirements, assessing the environmental and hygienic condition of drinking water sources for compliance with the established requirements; and inventorying sewage treatment facilities; Construction and reconstruction of water and sewage treatment facilities to reduce the amount of untreated wastewater discharged into water bodies and to recycle sediments; construction and implementation of drinking water treatment plants and bottling stations using the latest materials, technologies, equipment, devices and research and development; Developing schemes to optimise the operation of centralised water supply systems; equipping water and wastewater quality control laboratories with modern control and analytical equipment; Bringing the regulatory framework for drinking water supply and wastewater disposal in line with EU standards, taking into account national peculiarities, including in terms of increased liability for violations of environmental pollution standards, primarily discharges by industrial enterprises into water bodies; Carrying out comprehensive research and development activities using the latest technologies, equipment, materials, and devices, the use of which is aimed, in particular, at energy and resource conservation, improving the quality of drinking water and wastewater treatment, and implementing such developments. Funding for the last 3 years:

	2018 - UAH 200 million (the need is UAH 1.3 billion), 2019 - no funds were allocated at all. 2020 - no funds were allocated at all. Lack of funding for the project from the state budget.
Achieving the goals set	The set goals were not achieved. The reason is the lack of funding for the project from the state budget.
Name of the programme/fund/project	Environmental Protection Funds (hereinafter referred to as EPFs)
Name of the conservation measure	Environmental protection
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№1. Pollution by organic substances. №2. Pollution by nutrients. №3. Pollution by hazardous substances. №4. Littering with plastic and other solid waste. №5. Hydromorphological changes. №6. Spread of invasive species. №7. Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages.
Implementation of environmental protection measures and their financing	Today, Ukraine has a three-tiered system of environmental funds, consisting of the State Environmental Fund, regional and local (city, town and village) environmental funds. At the regional level, a significant source of funding for environmental protection measures is regional and local environmental funds. The environmental funds are used for targeted financing of environmental protection measures in accordance with the List of activities related to environmental protection measures approved by the Cabinet of Ministers of Ukraine dated 17.09.1996 No. 1147. In accordance with the Law of Ukraine "On Environmental Protection" dated 25.06.1991 No. 1264-XII (as amended on 18.12.2019), financing of environmental protection measures (hereinafter referred to as NEP), including water resources, is carried out at the expense of the State Budget of Ukraine, local budgets, funds of enterprises, institutions and organisations, NEP funds, voluntary contributions and other funds. Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Regulation on the State Environmental Protection Fund" No. 634 dated 7.05.1998 (as amended by the Resolution of the Cabinet of Ministers of Ukraine No. 1065 dated 4.12.2019), according to which the State Environmental Protection Fund became part of the State Budget of Ukraine. According to 2018 data, the share of environmental revenues (rent, environmental tax, special permits, fines) in the state budget amounted to over UAH 52 billion, of which UAH 4.6 billion was allocated to support the activities of the relevant central government agencies and environmental control, and only UAH 4.2 billion, or only 8% of environmental funds, were allocated for the implementation of environmental protection measures. This also includes the allocation of funds for the national budget programmes Dnipro-2021 and Drinking Water-2020. If these UAH 4.2 billion are distributed among agencies and entities, the following picture emerges: the State Agency of Water Resources (38%), local budgets (24%), SAUEZM (22%), the Ministry of Ecology (now the Ministry of Environment) (9%), and the State Environmental Inspectorate (4%) received the most environmental funds, Derzhgeonadra (2%). At present, Ukraine lacks monitoring of the effectiveness of environmental protection measures, a system of proper planning, inefficient use of funds, and the possibility of financial support for environmental modernisation by business entities themselves
Achieving the goals set	The set goals have not been achieved. In fact, the entire environmental tax collected is dissipated in within the general and special funds of the State and local budgets.
Name of the programme/fund/project	The National Programme for the Development of Nature Reserves for the period up to 2020
Name of the conservation measure	Preservation and expansion of the country's nature reserve fund.

	RBMP / Section 3 "Areas (territories) to be protected and their mapping: The Emerald Network; sanitary protection zones; protection zones for valuable aquatic bioresources; surface/groundwater areas used for recreational purposes, medical, resort and recreational purposes, as well as waters intended for bathing; areas vulnerable to (accumulation of) nitrates"
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№6. Spread of invasive species. No. 7: Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages. Dzhekelnya River /UA_M 6.9_00074 Mokra Belosarayskaya /UA_M 6.9 _00202 Sivash /UA_M 6.9_0547 Sivash settlement /UA_M 6.9_0540
Implementation of environmental protection measures and their financing	In 2019, the number of sites and territories of the nature reserve fund (NRF) of national and local importance increased by 116 units with a total area of 94224.2 hectares. In 2019, 116 territories and objects of the nature reserve fund were created (declared), 9 were expanded, 3 were reduced in area, 1 status was cancelled and 13 objects were changed in category. The NRF is managed by the Ministry of Ecology and is financed through the state budget programme "Conservation of protected areas". Last year, UAH 403734.6 thousand (state fund) and UAH 25644.9 thousand (special fund) were spent on measures to preserve and expand protected areas, totalling UAH 429581.5 thousand. In general, the performance indicators under this budget programme were met. The area of protected areas of Ukraine was increased by 1%, and the territories of protected areas were expanded: Uzhanskyi NNP, Oleshkivski Sands NNP, Biloberezhzhia Sviatoslav NNP. Within the Pryazovia river basin, there are three national nature parks: Pryazovskyi National Nature Park (Zaporizhzhia oblast), Meotida National Nature Park (Donetsk oblast) and Azov-Sivash National Nature Park (Kherson oblast). In 2015, the regional budget was allocated to establish the boundaries of nature reserve fund objects from the UAH 369 thousand were allocated from the budget. The funds were used to establish the boundaries of protected areas in Vasyliv, Veseliv, Melitopol and Chernihiv districts.
Achieving the goals set	The set goals were not achieved. The reason is the lack of funding for the project from the state budget.
Name of the programme/fund/project	"Forestry and hunting management, protection and defence of forests in the forest fund" CPCF 2409060, approved by the Laws of Ukraine on the State Budget of Ukraine for 2019 year: 23.11.2018 No. 2629-VIII. URL: https://zakon.rada.gov.ua/laws/show/2629-19. and "On the State Budget of Ukraine for 2020" of 14.11.2019. No. 294-IX. URL: https://zakon.rada.gov.ua/laws/show/294-20.
Name of the conservation measure	Implementation of forest management and reforestation measures, creation of protective forest plantations.
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№1. Pollution by organic substances. №2. Pollution by nutrients. №3. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	Reduced forest cover leads to a deterioration in the water balance of soils, contributes to their desertification, changes water flow and increases water pollution from diffuse sources. Approved volumes of the Programme implementation: in 2019 - the general fund amounted to UAH 145,481.3 thousand and the special fund at the expense of rent for special use of forest resources - UAH 316,533.3 thousand. In 2020 - UAH 156,791.4 thousand from the general fund and UAH 288,183.7 thousand from the special fund. Approved amounts from the general budget were significantly lower and amounted to 14.3% of the need in 2019 and 23.4% in 2020. Funds from the special fund amounted to 41% of the need in 2019, and in 2020 their amount was lower compared to the previous year. All funds from the special fund were used to support companies in the southeastern region, where forests were destroyed by large fires.

Achieving the goals set	Afforestation of the territory helps to improve the structure of land use and reduce the load from diffuse sources. The target is partially achieved.
Name of the programme/fund/project	The State Fund for Regional Development (SFRD).
Name of the conservation measure	Financing of regional development projects on a competitive basis and in accordance with regional development strategies and action plans for their implementation.
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№1. Pollution by organic substances. №2. Pollution by nutrients. №3. Pollution by hazardous substances. №5. Hydromorphological changes. Velykyi Utliuk River /UA_M 6.9.0021 Korsak River /UA_M6.9.0089 Sivash settlement /UA_M 6.9_0547 Berdianske reservoir /UA_M 6.9_0140
Implementation of environmental protection measures and their financing	The amount of funds of the SFRD should be at least 1 per cent of the projected revenues of the general fund of the draft State Budget of Ukraine for the relevant budget period The distribution of funds of the SFRD by administrative-territorial units and investment programmes and regional development projects is approved by the Cabinet of Ministers of Ukraine in agreement with the Verkhovna Rada Committee on Budget. In 2020, the SFRD financed 284 projects in the water supply and wastewater treatment sector with a total value of UAH 294 million. In Zaporizhzhia region within the Azov river basin: In 2019, UAH 44.7 million was allocated from the SFRD (Order of the Cabinet of Ministers of Ukraine No. 351-r dated 15.05.2019, as amended), of which 2 projects were implemented to reconstruct water supply networks (Novouspenivka village, Veselivskyi district, from Davydivka village to Atmanai village, Yakymivskyi district); In 2020, the project "Water supply to the city of Berdiansk by the Oblavvodokanal of the Zaporizhzhia Regional Council" was launched in the Pryazovia River Basin. Overhaul of the pipeline from PC 503+45 to PC 513+50 near Volodymyrivka village, Pryazovskyi district, Zaporizhzhia region. Correction", which was implemented during 2020-2021. UAH 7897.392 thousand was allocated from the SFRD for the project implementation in 2021 according to the CMU Order No. 297-p dated 12 April 2021. A project in the Kherson region within the rivers of the Azov Sea has begun to be funded "Reconstruction of sewage treatment facilities in the city of Henichesk, Kherson region", which was implemented in 2017-2019 and 2021. The reconstruction of the sewage treatment plant in Genichesk was included in this year's list of "Big Construction" projects in the Kherson region. The works require funding of over UAH 14.58 million to complete. Co-financing from the municipal budget is over UAH 2.811 million. The project resulted in the construction of 2 blocks of 500 cubic metres per day wastewater treatment plants and a 2300 m long discharge header, as well as improved living and recreational conditions for the residents of Henichesk. Genichesk and the seasonal population in the resort and recreational area.
Achieving the goals set	The set goals were not achieved. The reason is the lack of funding for the project from the state budget.
Name of the programme/fund/project	The State Fund for Stimulation and Financing of Environmental Protection Measures (State Fund for Environmental Protection - SFEP)
Name of the conservation measure	Financing of environmental protection measures, the list of which is specified in the CMU Resolution No. 1147 of 17.09.96.
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№1. Pollution by organic substances. №2. Pollution by nutrients. №3. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	In accordance with the Law of Ukraine "On Environmental Protection of 25.06.1991, No. 1264-XII. (as amended on 18.12.2019) financing of protection measures environmental protection (hereinafter referred to as the NPS), including water resources, is carried out

	at the expense of the State Budget of Ukraine, local budgets, funds of enterprises, institutions and organisations, the National Environmental Protection Agency, voluntary contributions and other funds. By the Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Regulation on the State Environmental Protection Fund" dated 7.05.1998 No. 634 (as amended by the Resolution of the Cabinet of Ministers of Ukraine No. 1065 dated 4.12.2019), the State Environmental Protection Fund became part of the State Budget of Ukraine. The mechanism for using funds provided in the state budget for targeted programmes is approved by the Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Procedure for Using Funds Provided in the State Budget for Environmental Protection Measures" of 28.02.2011 No. 163 (as amended on 14.05.2019). The environmental tax collected for emissions, pollutant discharges and waste disposal is distributed as follows: 45% is allocated to the general fund of the state budget; 55% - to the special fund of local budgets (except for the tax levied on radioactive waste generation). In turn, the special fund of local budgets is directed to: 25% - village, settlement, city budgets, budgets of amalgamated territorial communities established in accordance with the law and the perspective plan for the formation of community territories; 30% - regional budgets and the budget of the Autonomous Republic of Crimea. The special fund of the budgets of Kyiv and Sevastopol receives 55% of the environmental tax. Out of the UAH 52 billion collected in 2018, only UAH 4.2 billion (8%) was allocated for implementation environmental protection measures. Other funds were spent for other purposes.
Achieving the goals set	The target was not achieved, as the entirety of the environmental tax collected is dissipated within the general and special funds of the state and local budgets.
Name of the programme/fund/project	The Regional Target Programme "Drinking Water of Zaporizhzhya Oblast" for 2012-2020
Name of the conservation measure	Construction, reconstruction and overhaul of water supply systems in the settlements of Zaporizhzhya region. Construction and reconstruction of water intake facilities, in particular in low-water settlements and those with the highest water quality deviations, with the prospect of attracting new subscribers. Implementation of drinking water treatment plants in centralised water supply systems.
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№1. Pollution by organic substances. №2. Pollution by nutrients. №3. Pollution by hazardous substances. Group of UAM6900N200 group UAM6900N100 group UAM690AR100
Implementation of environmental protection measures and their financing	A prerequisite for the Programme was co-financing from local budgets and/or other sources taking into account index tax capacity of individual administrative-territorial units (ATCs) in the following ratio: up to UAH 0.5 million inclusive - 20% of the regional budget; from UAH 0.51 to 0.8 million inclusive - 30% of the regional budget; from UAH 0.81 to 1.0 million - 40% of the regional budget; more than UAH 1.0 million - 50% of the regional budget. During 2012-2020, UAH 272,470 thousand was financed, of which UAH 49,397 thousand - from the state budget, UAH 191,922 thousand - from the regional budget, UAH 31,151 thousand - at the expense of local budgets. As a result of the Programme implementation, water supply and sewerage were improved in the settlements of Berdiansk, Bilmatsk, Vasylivka, Veselivka, Pologivka, Yakymivka, Melitopol and Tokmak districts of Zaporizhzhia Oblast. The most problematic settlements in the Pryazovia river basin in terms of water supply and sewerage remain those in Prymorskyi and Pryazovian districts.
Achieving the goals set	The set goals were not achieved. The reason is the lack of funding for the project from the state budget.

Name of the programme/fund/project	The Regional Comprehensive Programme for Environmental Protection, Rational Use of Natural Resources and Environmental Safety in Zaporizhzhia Oblast
Name of the conservation measure	Monitoring of the environment in Zaporizhzhia region.
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№1. Pollution by organic substances. №2. Pollution by nutrients. №3. Pollution by hazardous substances. Group UAM6900N200 UAM6900N100 UAM690AR100
Implementation of environmental protection measures and their financing	The programme aims to identify key areas of action, measures and resources to improve environmental safety in the region, develop a set of coordinated and interrelated environmental, legal, economic, organisational, technical and other measures to restore and ensure the sustainable functioning of all ecosystems in the region until 2020. In 2019-2021, the total amount of UAH 16,063.5 thousand was financed, of which UAH 10,617 thousand was financed from the regional budget, UAH 5,446.5 thousand - at the expense of local budgets. As a result of the Programme implementation, sewerage was partially improved in the settlements of Berdiansk, Melitopol, Prymorskyi and Chernihiv districts of Zaporizhzhia Oblast.
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.
Name of the programme/fund/project	The Regional Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin in Zaporizhzhia Oblast for the period up to 2021
Name of the conservation measure	Improvement of drainage facilities at housing and communal services, business facilities, and urbanised areas
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№5. Hydromorphological changes. №7. Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages. Azov Sea /UA_M 6.9.0553 Molochna River /UA_M 6.9.0038
Implementation of environmental protection measures and their financing	UAH 160.4 million is allocated for the implementation of water protection measures under the second stage of the Programme, including UAH 106.7 million from the state budget, UAH 51.9 million from the local budget, and UAH 1.7 million from other sources. In 2019, UAH 18.9 million was financed from the local budget. The following activities were carried out at the expense of local budgets as part of the programme: reconstruction of sewerage networks on Evropeiska Street in Berdiansk (UAH 235.6 thousand); reconstruction of the sewerage collector on Interkulturna Street in Melitopol - UAH 117.6 thousand; reconstruction of intra-quarter sewerage networks from the Hospital Town on Kiziyarska Street in Melitopol - UAH 3,466.9 thousand; reconstruction of the pressure gravity sewerage collector on Chaikovskogo Street in Melitopol - UAH 15,094.4 thousand; - construction of the second line of the pressure sewer from No. 5 in Berdiansk - UAH 30.2 thousand. As a result of the Programme implementation, sewerage in the settlements of Berdiansk and Melitopol districts of Zaporizhzhia Oblast was partially improved. The main executor of the event is the Department of Environmental Protection of the Zaporizhzhia Regional State Administration.
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.
Name of the programme/fund/project	The programme for the environmental rehabilitation of the Molochna River basin, restoration of its hydrological regime, improvement and conservation of biodiversity until 2025

Name of the conservation measure	Protection of water resources from pollution and depletion, conservation of biodiversity, rational use of water resources, ensuring sustainable functioning of ecosystems, prevention of harmful effects of water and elimination of its consequences
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№1. Pollution by organic substances. №2. Pollution by nutrients. №3. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The programme was developed to identify a list of measures aimed at environmental rehabilitation of the basin, preventing the growth of anthropogenic impact on the river basin, ensuring environmentally safe living conditions for the population and economic activity and protecting water resources from pollution and depletion, conserving biodiversity, rational use of water resources, ensuring sustainable functioning of ecosystems, preventing harmful effects of water and eliminating its consequences. The main implementer of the Programme is the Department of Environmental Protection of the Zaporizhzhia Oblast State Administration. According to the data provided by the Programme implementers no funding was provided for the activities
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not funded.
Name of the programme/fund/project	The Programme of Economic and Social Development of Zaporizhzhia Region in 2019
Name of the conservation measure	Conservation and development of the Azov National Nature Park
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№5. Hydromorphological changes. №7. Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages. Molochnyi Liman /UA_M 6.9_0538
Implementation of environmental protection measures and their financing	In 2019, funds totalling UAH 98,219,905 thousand were allocated from the state budget for environmental protection measures in Zaporizhzhia Oblast, with UAH 20,485,736 thousand used by customers, including UAH 27,475,918 thousand was allocated from the State Budget for the construction of the environmental and educational visitor centre of the Azov National Nature Park, and UAH 2,990,0 thousand was spent; UAH 5,137,012 thousand was allocated from the state budget to create expositions for the environmental and educational visitor centre of the Azov National Nature Park, and UAH 85.8 thousand was spent; UAH 55,206,975 thousand was allocated from the state budget for the construction of a connecting canal to restore the water connection between the Azov Sea and the Molochny Estuary, and UAH 7,009.9 thousand was spent; Thanks to a set of measures, the biological and landscape diversity of the Azov National Nature Park, which includes the Molochny Estuary, has been preserved.
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.
Name of the programme/fund/project	Programme for the development of the forest fund of Zaporizhzhia region for the period up to 2022
Name of the conservation measure	Creation of protective forest plantations on eroded lands
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№7. Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages. UAM6900N200 UAM6900N100 UAM690AR100
Implementation of environmental protection measures and their financing	The programme envisages the development of forestry in the region, including increasing the forest cover of the region at the expense of areas that can no longer be used for agricultural work due to land degradation.

	Within the Azov river basin and as part of these activities, the company planted and sowed forests in the area: In 2019, the area covered 146.5 hectares; in 2020, 220.35 hectares. Funds were used to create protective forest plantations on eroded land: In 2019 - UAH 1605.1 thousand. - from the regional budget; 1097.2 - other sources (own funds). In 2020 - UAH 1804 thousand. - from the regional budget; 814.75 - other sources (own funds). In 2021, no funds were allocated from the regional budget for these measures. The event is organised by the Department of Agricultural Development of Zaporizhzhia Regional State Administration.
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.
Name of the programme/fund/project	Regional target programme for clearing and regulating riverbeds in Donetsk region for 2018-202
Name of the conservation measure	"Restoration and maintenance of favourable hydrological regime and sanitary conditions rivers"
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№5. Hydromorphological changes. №7. Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages. Mokra Bilosaraika river /UA_M 6.9.0201 Zelena river /UA_M 6.9.0191 Kalchik River /UA_M 6.9_0290 Kalmius River /UA_M 6.9_0213
Implementation of environmental protection measures and their financing	Within the Pryazovia River Basin, 2 activities worth UAH 1.6 million were planned to be implemented at the expense of local budgets, namely preparation of design and estimate documentation for the project "Clearing the channel of the Mokra Bilosaraika River" in Mangush, Mangush district, Donetsk region, in the amount of UAH 0.8 million; preparation of design and estimate documentation for the project "Clearing the Zelena Riverbed" in Urzuf village, Mangush district, Donetsk region, for UAH 0.8 million. Due to the lack of funds in the local budget, these measures were not funded in 2020. Also, in 2020, the measure "Drainage from Nakhimov Ave. along Klenova Balka to Primorsky district of Mariupol. Central spur. Extension to Metallurgiv Avenue (design and construction)" in the amount of UAH 16.0 million.
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.
Name of the programme/fund/project	The Programme of Economic and Social Development of Donetsk Oblast for 2019 and the main directions of development for 2020-2021, the Programme of Economic and Social Development of Donetsk Oblast for 2021
Name of the conservation measure	Protection and rational use of water resources
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№5. Hydromorphological changes. №7. Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages. Kalchyk River /UA_M6.9_0290 Kalmius River /UA_M 6.9_0213 Mokra Volnovakha river /UA_M 6.9_0244
Implementation of environmental protection measures and their financing	In 2019-2021, 2 activities worth UAH 20.47 million were carried out in the area of Water Resources Protection and Rational Use within the Azov River Basin:

	1 measure for the amount of UAH 11.98 million (UAH 8.0 million from the regional fund and UAH 3.98 million from other sources) - Mariupol Mariupol (drainage system from Nakhimov Avenue along Klenova Balka in Prymorskyi district of Mariupol, extension to Metallurgiv Avenue); 1 measure in the amount of UAH 8.49 million - reconstruction of the technological part of the sewage treatment plant in Volnovakha (25.1% of the planned funds).
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.
Name of the programme/fund/project	The Programme of Economic and Social Development of Donetsk Oblast for 2019 and the main directions of development for 2020-2021, the Programme of Economic and Social Development of Donetsk Oblast for 2021
Name of the conservation measure	Science, information, international cooperation and environmental monitoring
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№5. Hydromorphological changes. №7. Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages. Kalchik river /UA_M 6.9_ from 0281 - to 0290 Kalmius river /UA_M 6.9_ from 0203 - to 0213
Implementation of environmental protection measures and their financing	In the area of Science, Information, International Cooperation and Monitoring of Environmental Protection, 7 activities worth UAH 15.93 million were implemented within the Azov River Basin in 2019-2021: 2 measures worth UAH 3.35 million - installation of automated monitoring stations on the Kalmius (0.4% of the planned funds) and Kalchik (83% of the planned funds) rivers with real-time determination of water levels and quality indicators (mineralisation, nitrogen group, pH, temperature, etc.); 1 measure in the amount of UAH 0.071 million - modernisation of the environmental monitoring system designed to detect seawater pollutants (27.3%); 2 measures in the amount of UAH 4.09 million - installation of automated control posts on the Kalmius River in Volnovakha district (97% of the planned funds) and on the Kalchyk River in Donetsk region (90.1% of the planned funds), including adjustments to the working drafts; 1 measure in the amount of UAH 0.51 million - additional monitoring of surface water conditions in Donetsk Oblast in the basins of the Siverskyi Donets, Azov and Lower Dnipro rivers (83.6%); 1 measure in the amount of UAH 0.047 million - maintenance of the automated system environmental monitoring system designed to identify seawater pollutants (100%);
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.
Name of the programme/fund/project	Comprehensive Programme for the Development of the Water Sector in Kherson Oblast until 2020
Name of the conservation measure	Protection against the harmful effects of water from rural settlements and agricultural land
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№5. Hydromorphological changes. №7. Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages. Azov Sea /UA_M 6.9_0555 Syvash Bay /UA_M 6.9_0547
Implementation of environmental protection measures and their financing	In 2019, UAH 1,592.9 thousand was allocated, including UAH 7.0 thousand in Novotroitsk district to implement measures to protect the district's settlements from flooding and flooding in Hromivka village council; in Henichesk district - UAH 1,585.9 thousand for the reconstruction of sewage treatment facilities in Genichesk.
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.

Name of the programme/fund/project	Comprehensive Programme for the Development of the Water Sector in Kherson Oblast until 2020
Name of the conservation measure	Protecting the district's settlements from flooding and inundation
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№5. Hydromorphological changes. №7. Issues related to the relationship between water quantity and quality in relation to climate change. №8. Floods and floods, flooding of territories. №9. Droughts and water shortages. canal P-5-1 /UA_M 6.9_0514
Implementation of environmental protection measures and their financing	In 2020, UAH 31,362 thousand was allocated, namely UAH 31,362 thousand in Novotroitsk district to implement measures to protect the district's settlements from flooding and flooding in Hromivka village council and Novotroitsk settlement council. In 2021, UAH 70.513 thousand was allocated, namely in the Genichesk (Novotroitsk) district - UAH 70.513 thousand to implement measures to protect the district's settlements from flooding in the Novotroitsk SCOMMUNITY (Syvaske village, Mayachka village).
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.
Name of the programme/fund/project	"Proposals for the formation of a list of environmental protection measures in Kherson region for 2019, 2020 and 2021", which were submitted to the State Agency of Ukraine for Water Resources.
Name of the conservation measure	Rational use and protection of land resources.
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№1. Pollution by organic substances. №2. Pollution by nutrients. №3. Pollution by hazardous substances. Velyka Kalga River /UA_M 6.9_0010 Velyki Sirohozy /UA_M 6.9_0001
Implementation of environmental protection measures and their financing	The funds allocated by the State Agency of Ukraine for Water Resources under the budget programme were used to carry out construction works in 2019-2021 in the amount of UAH 95.975 million at the facilities: "New construction of the Ivanivka group water supply system from Ivanivka village, Ivanivka district, to N. Sirohozy village, Nizhneseirohozy district, Kherson region". One pumping station and a clean water reservoir were built. "New construction of the Ivanivka group water supply system from N. Sirohozy to V. Sirohozy village of Nizhneseerogozky district, Kherson region". The company built 6.18 km of water supply network and a clean water reservoir. These measures will improve the reliability and quality of water supply for 8,000 residents of Ivanivka district.
Achieving the goals set	The set goals have been partially achieved. The Programme activities have not been fully funded.
Name of the programme/fund/project	The Regional Programme "Drinking Water of Kherson Region" for 2012-2020
Name of the conservation measure	Optimisation of centralised water supply and wastewater systems
Compliance with environmental protection of the measure to the main water and environmental issues and the code the surface/groundwater body it affects	№1. Pollution by organic substances. №2. Pollution by nutrients. №3. Pollution by hazardous substances. group UAM6900N200
Implementation of environmental protection measures and their financing	As part of the Programme's activities, 8.1 km of sewerage networks were repaired in the region's settlements, and a scheme for optimising the operation of centralised water supply systems in Genichesk was developed, with a total funding of UAH 2847.1 thousand.
Achieving the goals set	The defined objectives were not achieved. The Programme activities were not fully funded.

Annex 11. Full list of mesures presented separately in Excel format

Annex 12 Cost-effectiveness analysis of the PoM

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure	Social efficiency	Total cost of investment	Value for money
							thousand people		*million UAH*	
	1	2	3	4	5	7	8	9	10	11
35	Reconstruction of STP and SN in the city of Makiivka (including the residential settlement of Khanzhekove-Severne) of Makiivka community, Donetsk district, Donetsk region	4,25	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	387,6	4	6976,8	5
58	Reconstruction of STP and SN in Mariupol, Mariupol community, Mariupol district, Donetsk region	4,25	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	273,7	4	2769,8	5
7	Reconstruction/modernisation of STP and SN in Melitopol, Melitopol community, Melitopol district, Zaporizhzhia region	4	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	148,8	3	1505,9	5
36	Reconstruction of STP and SN in Khartsyzsk, Khartsyzsk community, Donetsk district, Donetsk region	4	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	62,2	3	1119,6	5
49	Reconstruction of STP and SN in Yenakiyevo, Yenakiyevo community, Horlivka district, Donetsk region	4	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	90	3	1620	5
54	Reconstruction of STP and SN in Chystyakove, Chystyakivska community, Donetsk district, Donetsk region	4	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	61,7	3	1207,8	5
59	Reconstruction/modernisation of STP and SN in the city of Berdiansk, Berdiansk community, Berdiansk district, Zaporizhzhia region	4	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	106,311	3	1075,8	5
51	Reconstruction of STP and SN in Shakhtarsk, Shakhtarska community, Horlivka district, Donetsk region	3,75	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	50,3	3	905,4	4
18	Reconstruction, modernisation of STP and SN in Tokmak, Pologivskyi district, Zaporizhzhia region	3,5	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	30,608	2	550,9	4
46	Reconstruction of STP and SN in Krestivka, Horlivka district, Donetsk region	3,5	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	30,5	2	549	4

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure	Social efficiency	Total cost of investment	Value for money
							thousand people		*million UAH*	
	1	2	3	4	5	7	8	9	10	11
55	Reconstruction of STP and SN in Snizhne, Snizhniansk community, Horlivka district, Donetsk region	3,5	**high**	SWMI 1 SWMI 2 SWMI 3	3	5	46	2	828	4
12	Construction of STP and SN in the village of Kostiantynivka, Kostiantynivska community, Melitopol district, Zaporizhzhia region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	12,081	2	217,5	3
21	Construction of STP and SN in Prymorsk, Prymorsk community, Berdiansk district, Zaporizhzhia region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	12,1	2	217,8	3
31	Reconstruction of industrial wastewater treatment facilities after water treatment at the Donetsk Regional Production Department of the Utility Company "Water of Donbass" of the Donetsk community of the Donetsk district of Donetsk region	3,25	**average**	SWMI 3	1	5	913,3	4	272	3
32	Reconstruction of STP and SN in Kalmiuske, Kalmiuska community, Kalmiuska district, Donetsk region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	10,1	2	181,8	3
33	Construction of STP and SN s in Sartana village, Sartanska community, Mariupol district, Donetsk region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	10,1	2	181,8	3
37	Reconstruction of STP and SN in Volnovakha, Volnovakha community, Volnovakha district, Donetsk region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	14,3	2	257,4	3
40	Reconstruction of STP and SN in Dokuchaevsk, Dokuchaevska community, Kalmius district, Donetsk region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	19,6	2	352,8	3
41	Reconstruction of industrial wastewater treatment facilities after water treatment at the Mariupol Regional Production Department of the Water of Donbass Company, Mariupol community, Mariupol District, Donetsk Region	3,25	**average**	SWMI 3	1	5	380,1	4	463,9	3
43	Reconstruction of the STP and SN in Novoazovsk, Novoazovsk community, Kalmius district, Donetsk region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	11,1	2	199,8	3
45	Reconstruction of industrial wastewater treatment facilities after water treatment at the Yenakiyevo	3,25	**average**	SWMI 3	1	5	262	4	337,7	3

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure	Social efficiency	Total cost of investment	Value for money
							thousand people		*million UAH*	
	1	2	3	4	5	7	8	9	10	11
	Regional Production Department of the Water of Donbass Company, Yenakiyevo community, Donetsk District, Donetsk Region									
47	Reconstruction of STP and SN in Nyzhnya Krynka village, Makiivka community, Donetsk district, Donetsk region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	13,6	2	244,8	3
48	Reconstruction of STP and SN in Debaltseve, Debaltseve community, Horlivka District, Donetsk Region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	20	2	360	3
50	Reconstruction of STP and SN in Vuhlehirsk, Vuhlehirsk community, Horlivka district, Donetsk region	3,25	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	12	2	216	3
1	Construction of STP and SN in Vesele village, Veselove community, Melitopol district, Zaporizhzhia region	3	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	7,274	1	58,2	3
2	Construction and reconstruction of STP and SN in Yakymivka village, Yakymivka community, Melitopol district, Zaporizhzhia region	3	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	9,844	1	177,2	3
4	Construction of STP and SN in Chernihivka village, Chernihivska community, Berdiansk district, Zaporizhzhia region	3	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	7,274	1	58,2	3
15	Construction of STP and SN in Molochansk, Molochansk community, Pologivskyi district, Zaporizhzhia region	3	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	7,09	1	57,6	3
19	Construction of external SN and STP in Pryazovske village, Zaporizhzhia region	3	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	6,295	1	132,2	3
28	Construction of STP and SN in Mangush village, Mangush community, Mariupol district, Donetsk region	3	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	7,1	1	77,8	3
38	Reconstruction of STP and SN in Novotroitske village, Olhynska community, Volnovakha district, Donetsk region	3	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	7,2	1	57,6	3
39	Reconstruction of industrial wastewater treatment	3	**average**	SWMI 3	1	5	50	3	76,5	3

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure	Social efficiency	Total cost of investment	Value for money
							thousand people		*million UAH*	
	1	2	3	4	5	7	8	9	10	11
	facilities after water treatment at the Pokrovsky Regional Production Department of the Water of Donbass Company, Olhynia community, Volnovakha District, Donetsk Region									
52	Reconstruction of STP and SN in Moskovske village of Shakhtarske community, Horlivka district, Donetsk region	3	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	46,4	2	5,6	2
53	Reconstruction of industrial wastewater treatment facilities after water treatment at the Makiivka Production Department of the Water and Sewerage Facilities of the Water of Donbass Company, Makiivka community, Donetsk District, Donetsk Region	3	**average**	SWMI 3	1	5	50	3	54,8	3
56	Reconstruction of STP and SN of the sewerage system in Novotroitske village of Novotroitske community, Genichesk district, Kherson region	3	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	10,5	2	19,2405	2
3	Reconstruction/modernisation of STP and SN in Frukove village, Novenskaya community, Melitopol district, Zaporizhzhia region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	1,057	1	8,5	2
8	Construction of STP and SN in Myrne village, Myrnenska community, Melitopol district, Zaporizhzhia region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	2,944	1	23,6	2
10	Construction of STP and SN in Pryshyb village, Mykhailivska community, Vasylivskyi district, Zaporizhzhia region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	3,403	1	27,2	2
11	Construction of STP and SN in the village of Tymoshivka, Mykhailivska community, Vasylivskyi district, Zaporizhzhia region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	2,314	1	18,512	2
13	Construction of STP and SN in Novobohdanivske village, Novobohdanivska community, Melitopol district, Zaporizhzhia region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	2,2	1	17,6	2
14	Construction of STP and SN in Voznesenka village, Kostiantynivska community, Melitopol district, Zaporizhzhia region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	5,123	1	40,98	2
16	Construction of STP and SN in the village of Semenivka, Semenivska community, Melitopol	2,75	**average**	SWMI 1 SWMI	3	5	2,869	1	22,95	2

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure	Social efficiency	Total cost of investment	Value for money
							thousand people		*million UAH*	
	1	2	3	4	5	7	8	9	10	11
	district, Zaporizhzhia region			2 SWMI 3						
17	Construction of STP and SN in the village of Terpinnya, Terpinivska community, Melitopol district, Zaporizhzhia region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	4,8	1	38,4	2
20	Construction of STP and SN in Novovasylivka village, Novovasylivka community, Melitopol district, Zaporizhzhia region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	2,2	1	17,6	2
23	Construction of STP and SN in Novovasylivka village, Berdiansk community, Berdiansk district, Zaporizhzhia region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	2,6	1	20,8	2
25	Construction of STP and SN in Urzuf village, Mangush community, Mariupol district, Donetsk region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	2,5	1	20	2
29	Construction of STP and SN in Yalta village, Mangush community, Mariupol district, Donetsk region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	5,2	1	41,6	2
42	Reconstruction of STP and SN in Donske village, Volnovakha community, Volnovakha district, Donetsk region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	4,5	1	36	2
44	Reconstruction of STP and SN in Boykivske village, Novoazovske community, Kalmius district, Donetsk region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	4,4	1	35,2	2
57	Construction of STP and SN in Kyrylivka village, Kyrylivka community, Melitopol district, Zaporizhzhya region	2,75	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	3,472	1	27,776	2
30	Construction of a centralised sewerage system in Melekine village, Mangush community, Mariupol district, Donetsk region	2,5	**average**	SWMI 1 SWMI 2 SWMI 3	3	5	1,1	1	0,5	1
61	Improvement of state accounting of water use within the areas of the Azov River Basin within Donetsk, Zaporizhzhia, Luhansk and Kherson regions	2,25	**low**	SWMI 2 SWMI 4	2	3	0	1	90,6	3
34	Revitalisation of the Kalmius and Kalchyk rivers within the city of Mariupol, Mariupol community, Mariupol district, Donetsk region, after channel	2,25	**low**	SWMI 4	1	1	400	4	85	3

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure	Social efficiency	Total cost of investment	Value for money
							thousand people		*million UAH*	
	1	2	3	4	5	7	8	9	10	11
	studies									
9	Revitalisation of the Molochna River basin in Novobohdanivka, Terpinivka, Myrnenska, Semenivka, Kostiantynivka, Novenska TGs of Melitopol district, Zaporizhzhia region and Molochanska community of Pologivskyi district, Zaporizhzhia region	1,5	**low**	SWMI 4	1	1	0	1	221,0	3
22	Reconstruction and expansion of the solid waste landfill in Chernihivka village, Chernihivska community, Berdiansk district, Zaporizhzhia region	1,5	**low**	other SWMI	1	1	5,5	1	233,7	3
60	Establishment of water protection zones and bank protection strips within the Azov River Basin area of Donetsk, Zaporizhzhia, Luhansk and Kherson regions	1,5	**low**	SWMI 2 SWMI 4	2	1	0	1	3	2
5	Establishment of water protection zones and bank protection strips for the Kainkulatske reservoir within the Molochna River basin in the Chernihiv community of Berdiansk district	1,5	**low**	SWMI 2, SWMI 4	2	1	9,502	1	4,0	2
6	Revitalisation of the Molochna River basin in Tokmak, Tokmak community, Pologivskyi district, Zaporizhzhia region	1,25	**very low**	SWMI 4	1	1	0	1	29,1	2
24	Revitalisation of Zhuravlova beam of the Berda river basin with the elimination of 4 dams outside the village of Starodubivka, Mangush community, Mariupol district, Donetsk region	1,25	**very low**	SWMI 4	1	1	0,9	1	6,7	2
26	Revitalisation of the Zelena River within the village of Urzuf, Mangush community, Mariupol Rayon, Donetsk Oblast	1,25	**very low**	SWMI 4	1	1	2,9	1	20	2
27	Revitalisation of the Mokra Bilosaraika River within the boundaries of Mangush village, Mariupol district, Donetsk region	1,25	**very low**	SWMI 4	1	1	7,7	1	14,3	2