This document is preliminary in nature and has been prepared based on ongoing working analyses carried out for the purposes of the Environmental Impact Assessment Report. The information and conclusions contained herein may be subject to change upon completion of the Environmental Impact Assessment Report. This document does not constitute an environmental impact assessment report within the meaning of Division V, Chapter 2 of the Act of 3 October 2008 on Access to Information on the Environment and Environmental Protection, Public Participation in Environmental Protection and Environmental Impact Assessments.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

DRAFT VERSION

Contract 5.10.1. Construction of the Kamieniec Ząbkowicki Reservoir - Preparation of design documentation, including obtaining administrative permits and the provision of Author's Supervision, as well as the preparation of bidding documents necessary to select a Contractor for future works under the future Poland's Building Climate Resilience in Water Management Project

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Wrocław, October 2026

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List of Abbreviations

Name	Description
ARMA	Agency for Restructuring and Modernization of Agriculture
BDO	Database of Products, Packaging, and Waste Management
OHS	Occupational Safety and Health
PORC	Public Opinion Research Center
CRVA	Climate Change Risk and Vulnerability Assessment (CRVA)
C-ESMP	Construction Environmental and Social Management Plan
NR	National Road
SCH	Social Care Home
LSRRA	Lower Silesian Road and Railway Authority
DŚU	Environmental Impact Decision
VR	Provincial Road
ESF	World Bank Environmental and Social Framework (ESF)
ESIA	Environmental and Social Impact Assessment (ESIA)
ESS	Environmental and Social Standard (ESS)
FB	Facebook social media platform
FAQ	Frequently Asked Questions
GBV	Gender-Based Violence (GBV)
GDfNRM	General Directorate for National Roads and Motorways
GRM	Grievance Redress Mechanism (GRM)
GUS	Central Statistical Office
MGB	Major Groundwater Basin
HCVF	High Conservation Value Forests – HCVF)
USWB	Unified Surface Water Body
UGB	Unified Groundwater Body
PIU	Project Implementation Unit
NASC	National Agricultural Support Centre
ASIF	Agricultural Social Insurance Fund
MRM	Mineral Resources Mine
SF	State Forests
MaxPL	Maximum Pool Level
MIDAS	Polish Mineral Resources Management and Protection System
MinPL	Minimum Pool level
MPZ	Grievance Redress Mechanism
NPL	Normal pool level
NZOZ	Non-public Healthcare Facility
OPS	Social Assistance Center
PAN	Polish Academy of Sciences
PAP	Project Affected Person (PAP)
PCB	Polychlorinated biphenyls

Name	Description
PGW WP	State Water Management Authority – Polish Waters
IPIP	Investment Implementation Permit
RAP	Land Acquisition and Resettlement Plan
SEP	Stakeholder Engagement Plan
ESMP	Environmental and Social Management Plan (ESMP)
PAA	Polish Angling Association
REGON	National Business Registry
GDPR	General Data Protection Regulation (Regulation (UE) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)
RZGW	Regional Water Management Authority
SEA	Sexual Exploitation and Abuse (SEA)
SH	Sexual Harassment (SH)
TOR	Terms of Reference
SP	State Treasury
SP	Elementary School
TEES	Technical, Economic, and Environmental Studies
TO	Permanent restriction on the use of real estate
WUOZ	Provincial Office for the Protection of Monuments
WWA	Polycyclic aromatic hydrocarbons
PfRI	Permit for road investment
ZUS	Social Insurance Institution
WSUC	Water and Sewage Utility Company

Glossary

Name	Description
Birds Directive	Directive 2009/147/EC of November 30, 2009, on the conservation of wild birds
Habitats Directive	Council Directive 92/43/EEC of May 21, 1992, on the conservation of natural habitats and of wild fauna and flora
Client / Project Owner / Investor	State Water Management Authority – Wody Polskie
Contract Engineer / Engineer of the Contract	Entity (ies) providing construction supervision services Tasks
SDS	Safety Data Sheet
Consultant	Entity providing substantive and technical support services
State Forests	State Forest Enterprise
Natura 2000 (Natura 2000 site)	Natura 2000 sites are established in all member states, forming the European Natura 2000 Ecological Network. The main objective of the European Natura 2000 Ecological Network is to preserve specific types of natural habitats, as well as species and their habitats, which are considered valuable and threatened on a pan-European scale, and to protect biodiversity.
Project	Building Climate Resilience in Water Management Project
Designer	Contractor for the design of the Task
EIA Report	Environmental Impact Assessment Report (prepared for the purpose of obtaining a decision on environmental conditions)
Project Area	The area where the Project will be implemented
Construction Contractor	Contractor(s) for the construction of the Project
Task	Task – Construction of the Kamieniec Ząbkowicki Reservoir
Reservoir	Kamieniec Ząbkowicki Reservoir

1 Summary

This Environmental and Social Impact Assessment (ESIA) report concerns the Task involving the construction of the Kamieniec Ząbkowicki Reservoir on the Nysa Kłodzka River. The Task will be implemented as part of the Project titled: *"Building Climate Resilience in Water Management*." The Client (Project Owner / Investor) for the Task is the State Water Management Authority (Wody Polskie), represented by the Regional Water Management Authority in Wrocław.

This report was prepared to identify and assess the Task's potential impacts on the natural environment, society, and human health and living conditions. The assessment was conducted in accordance with applicable national laws, EU regulations, and the World Bank's Environmental and Social Framework (ESF), including the Environmental and Social Standards (ESS).

The Environmental and Social Assessment was preceded by a description of the Task, including its objectives, location, and scope of the investment. The report also presents alternatives to the proposed Task implementation option, including a "do-nothing" option involving the abandonment of the investment.

The report assessed the current state of the environment within the Task area - taking into account elements of the physical and biotic environment as well as landscape and cultural values. For the purposes of the assessment, an analysis was also conducted of the existing socio-economic conditions in the investment area, such as demographic structure, land use, infrastructure, living conditions, and existing forms of economic activity.

The assessment of the Task's potential impacts on the environment and society was conducted for the construction and operation phases of the investment. The assessment takes into account direct and indirect, short- and long-term, reversible and irreversible impacts, as well as cumulative impacts. It should be emphasized that a detailed assessment of the task's impact on the environment (natural and social) will be the subject of subsequent stages of the task's preparation and will be conducted as part of the procedure for issuing an environmental permit (decision on environmental conditions).

Based on the results of the environmental and social assessment for the Task, a preliminary version of the Environmental and Social Management Plan (ESMP) was developed, which is attached to this report. The Plan outlines mitigation measures for the preliminarily identified environmental and social impacts of the Task, as well as responsibilities for their implementation and monitoring. The Plan reflects the current stage of the investment's preparation—the Plan's assumptions will be refined as further work progresses.

The main positive impact of the Task is improved flood safety in the Nysa Kłodzka valley downstream of the Reservoir. As the uppermost reservoir of the cascade, the Reservoir will reduce the flood waves reaching the downstream reservoirs and increase their flood-control capacity.

The most significant negative environmental impacts are the permanent transformation of the land surface and landscape and the loss of terrestrial habitats within the reservoir basin, changes in the hydrological regime and sediment transport of the Nysa Kłodzka River, the restriction of the ecological corridor and of fish migration, to be mitigated by a fish pass, and the alteration or loss of cultural heritage. No critical habitat occurs within the Task area, and impacts on the nearby Natura 2000 sites are assessed as not significant.

The most significant negative social impacts are land acquisition, including the physical displacement of two households and the economic displacement of farms losing a significant part of their land, the decommissioning of the infiltration water intake, construction traffic on local roads, and the risk of social conflict arising from residents' concerns about the stability of the dam.

The probability of dam failure is very low, but in the analyzed failure scenarios 328 to 509 buildings could be located within the inundation area.

Areas of the assessment to be completed at subsequent stages

As the Task is at the conceptual design stage, the following areas of the assessment cannot be completed at this stage. They will be completed in the ESIA updates set out in Section 1.1.1, and in any case before the launch of the procurement of civil works, in line with the ESCP. The other analyses to be supplemented are listed in Section 1.1.

Area	Technical justification	Timing
Dam safety	The detailed design of the dam and the results of the geotechnical and hydrogeological investigations are not yet available.	Update II; dam safety instruments according to the schedule in Section 5.3
Public safety in the potential dam-failure inundation area	The dam break analysis quantifies only the buildings at risk. The residents and critical facilities require overlaying the inundation maps with population data.	In the Emergency Preparedness Plan (Section 5.3)
Drinking water supply	The location and yield of the replacement intake and the impacts on private wells depend on the hydrogeological documentation under way.	Update II
Construction-phase community health and safety, including traffic and railway safety	These risks depend on the construction methodology, transport routes and workforce, which will be known with the detailed design.	Update III

1.1 Project Status and ESIA Update Schedule

The Task "Construction of the Kamieniec Ząbkowicki Reservoir" is currently in the preparatory phase. At this stage, design work is underway, along with activities aimed at obtaining the required administrative decisions, including the Environmental Impact Decision (DŚU). Detailed technical parameters of the Task, the scope of design solutions, and the conditions for implementing the investment will be further specified as the design documentation and administrative procedures progress.

This ESIA has been prepared as a preliminary document reflecting the current stage of the Task'ss preparation. Its purpose is to provide a framework for identifying key environmental and social risks and impacts, to identify the relevant World Bank Environmental and Social Standards (ESS), and to define indicative mitigation measures, compensatory measures, and monitoring measures.

Due to the current stage of project preparation, some of the detailed analyses will be supplemented in subsequent updates to the ESIA. This applies in particular to the results of the comprehensive environmental inventory, detailed analyses of impacts on Natura 2000 sites, cumulative impact assessments, analyses related to water quality, environmental flows, and sediment transport, greenhouse gas emissions, dam safety, as well as the detailed measures outlined in the Environmental and Social Management Plan (ESMP).

ESIA updates will be conducted in phases, in parallel with the progress of design work and the administrative procedure. The scope of subsequent updates will be adjusted to the availability of new data, analysis results, findings from the EIA report, Environmental Impact Decision (DŚU), public consultations, and agreements with the World Bank.

1.1.1 ESIA Update Plan

Version	Stage / Milestone	Status	Scope of Update
Preliminary version (this document)	Submission to the World Bank for review	Completed	Framework for identifying impacts and risks; baseline data compiled based on available materials; identification of elements requiring further elaboration in subsequent stages.
Update I	After preparation of the EIA report, prior to submission of the application for the Environmental Impact Decision (DUŚ)	Prior to submission of the DŚU application	Supplemented with the results of completed inventories and environmental analyses, including those regarding impacts on Natura 2000 sites, cumulative impacts, water quality, environmental flows, sediment transport, GHG emissions, and dam safety.
Public disclosure of Update I	Following World Bank clearance of Update I	Upon receipt of World Bank clearance	Public disclosure of the ESIA (Update I) and the ESMP in Polish on the Investor's website, at the information points in Kamieniec Ząbkowicki and Bardo and through other channels specified in the SEP, and on the World Bank's website; public consultation meeting; comments recorded and taken into account in Update III.
Update II	After obtaining the Environmental Impact Decision (DUŚ)	Following issuance of the DUŚ decision	Incorporation of the conditions of the DUŚ decision as the obligations of the Project Owner / Investor; clarification of mitigation measures, compensatory measures, and monitoring measures, as well as requirements for the ESMP.

Version	Stage / Milestone	Status	Scope of Update
Update III	Following the ESIA public consultation procedure	Prior to the launch	Incorporation of comments from stakeholders and the World Bank; finalization of annexes and preparation of a version for World Bank approval prior to the tender procedure.
Subsequent updates	In the event of significant changes	To be updated during implementation, taking into account changes in circumstances/baseline conditions, project design, and construction methodologies.	Update the document in the event of significant changes regarding the scope of the Task, analysis results, administrative conditions, mitigation measures, or applicable legal and environmental and social requirements.

The update deadlines indicated in the table are indicative and will be refined as the administrative procedure progresses, as results of subsequent analyses become available, and in consultation with the World Bank.

2 Legal and Institutional Framework

This chapter analyzes the legal and institutional frameworks deemed most relevant to the environmental and social assessment of the Task. The analysis considers national laws and policies, EU directives and international agreements, as well as World Bank policy.

2.1 National laws, policies, and strategies

Tables 1 and 2 summarize the national regulations, policies, and strategies applicable to the Task.

Table 1 National regulations

Environmental Impact Assessments	Reference to the Task
a) Act of October 3, 2008, on Access to Information on the Environment and Its Protection, Public Participation in Environmental Protection, and Environmental Impact Assessments (i.e., Journal of Laws of 2024, item 1112); b) Regulation of the Council of Ministers of September 10, 2019 on projects that may have a significant impact on the environment (Journal of Laws of 2019, item 1839);	The task qualifies as a project that may always have a significant impact on the environment, for which an environmental impact assessment and obtaining an environmental permit (decision on environmental conditions) is mandatory.
Nature conservation	Reference to the Task
a) Act of April 16, 2004, on Nature Conservation (i.e., Journal of Laws of 2026, item 13); b) Regulation of the Minister of the Environment of December 16, 2016 on the protection of animal species (i.e., Journal of Laws of 2022, item 2380);	All necessary permits regarding nature conservation will be obtained as part of the Task; Construction works will be carried out in accordance with species protection and nature conservation requirements.

Environmental Impact Assessments	Reference to the Task
c) Regulation of the Minister of the Environment of October 9, 2014, on the protection of plant species (Journal of Laws of 2014, item 1409); d) Regulation of the Minister of the Environment of October 9, 2014, on the protection of fungal species (Journal of Laws of 2014, item 1408);	
Environmental protection and environmental quality standards	Reference to the Task
a) Act of April 17, 2001, Environmental Protection Law (i.e., Journal of Laws of 2025, item 647); b) Regulation of the Minister of the Environment of August 24, 2012, on levels of certain substances in the air (i.e., Journal of Laws of 2021, item 845); c) Regulation of the Minister of the Environment of September 1, 2016, on the method of conducting an assessment of soil contamination (Journal of Laws of 2016, item 1395); d) Regulation of the Minister of the Environment of June 14, 2007, on permissible noise levels in the environment (i.e., Journal of Laws of 2014, item 112);	The task will be implemented and operated in accordance with environmental protection regulations; Compliance with environmental quality standards will be ensured as part of the Task.
Water protection	Reference to the Task
a) Act of July 20, 2017, Water Law (i.e., Journal of Laws of 2025, item 960); b) Regulation of the Minister of Maritime Economy and Inland Navigation of July 12, 2019 on substances particularly harmful to the aquatic environment and the conditions to be met when discharging wastewater into water or soil, as well as when discharging rainwater or meltwater into water or water facilities (Journal of Laws of 2019, item 1311);	A water permit will be obtained for the purposes of implementing the Task.
Waste management	Reference to the Task
a) Act of December 14, 2012, on Waste (i.e., Journal of Laws of 2023, item 1587) b) Regulation of the Minister of Climate of January 2, 2020 on the waste catalog (Journal of Laws of 2020, item 10)	Waste generated within the Task will be managed in accordance with applicable regulations.
Protection of historical monuments	Reference to the Task
Act of July 27, 2003, on the Protection and the care of historical monuments (i.e., Journal of Laws of 2024, item 1292)	For the purposes of implementing the Task, all necessary decisions, consents and permits to carry out work in the vicinity of historic buildings will be obtained.
Real Estate Management	Reference to the Task
Act of August 21, 1997, on Real Estate Management (i.e., Journal of Laws of 2026, item 399)	The Task will be carried out in accordance with the rules governing the acquisition of real estate for public purposes.
Task Preparation	Reference to the Task
Act of July 8, 2010, on Special Rules for the Preparation of Investments in Flood Control Structures (i.e., Journal of Laws of 2026, item 104)	The Task will be carried out in accordance with the rules and conditions for the preparation of flood protection projects.

Table 2 National policies and strategies

Policy	Reference to the Task
National Environmental Policy 2030 – Development Strategy in the field of the environment and water management, adopted by Resolution No. 67 of the Council of Ministers of July 16, 2019 (Official Journal of 2019, item 794)	The Task aligns with the intervention area concerning climate change adaptation and natural disaster risk management.
Strategic Climate Change Adaptation Plan for Sectors and Areas Vulnerable to Climate Change by 2020 with a perspective to 2030 (SAP2020), adopted by the Council of Ministers on October 29, 2013	The Task aligns with the priority areas of adaptation measures to be undertaken in the field of water management.
Flood Risk Management Plan for the Odra River Basin, adopted by the Regulation of the Minister of Infrastructure of October 26, 2022 (Journal of Laws of 2022, item 2714)	The Task was included in the final list of measures aimed at reducing flood risk in the Odra River Basin.
Drought Mitigation Plan, adopted by the Regulation of the Minister of Infrastructure of July 15, 2021 (Journal of Laws of 2021, item 1615)	The Task has been included in the list of investment projects aimed at increasing water retention and supporting measures to counteract the effects of drought.
Program to Counteract Water Shortages for 2023–2027 with a Perspective to 2030, adopted by Resolution No. 152 of the Council of Ministers of August 22, 2023 ( ) (Official Gazette of 2023, item 1119)	The Task has been included in the list of investment measures aimed at improving water retention.

2.2 EU Directives and International Agreements

A list of EU directives and international agreements relevant to the Task is provided in Table 3 below.

Table 3 EU Directives and International Agreements

EU Directives	Reference to the Task
a) Directive 2011/92/UE of the European Parliament and of the Council of December 13, 2011, on the assessment of the effects of certain public and private projects on the environment (EIA); b) Council Directive 92/43/EEC of May 21, 1992 on the conservation of natural habitats and of wild fauna and flora, the aim of which is to preserve biodiversity through the protection of natural habitats and wild plant and animal species; c) Directive 2009/147/EC of the European Parliament and of the Council of November 30, 2009, on the conservation of wild birds; d) Directive 2003/4/EC of the European Parliament and of the Council of January 28, 2003, on public access to environmental information; e) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy; f) Regulation (UE) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)	The Directives have been implemented into Polish law and will therefore be applied within the scope of the project.

EU Directives	Reference to the Task
International obligations	Reference to the Task
a) Convention on Biological Diversity of June 5, 1992; b) Convention on the Conservation of European Wildlife and Natural Habitats of 19 September 1979 (Bern Convention) c) European Landscape Convention of October 20, 2000 d) The Aarhus Convention of June 25, 1998	These conventions have been ratified by Poland.

2.3 World Bank Environmental and Social Framework (ESF)

The World Bank's Environmental and Social Framework (ESF) comprises ten Environmental and Social Standards (ESS) that define the Bank's environmental and social policy requirements for investment projects co-financed by WB funds. In the context of the Task, eight standards apply, as listed in Table 4 below.

Table 4 World Bank Environmental and Social Standards

Standard	Reference to the Task
Standard ESS1: Assessment and Management of Environmental and Social Risks and Impacts	The Task is subject to an environmental and social assessment as part of this ESIA.
ESS2: Labor and Working Conditions	The standards will be addressed within the Task
Standard ESS3: Resource Efficiency and Pollution Prevention and Management	
ESS4 Standard: Community Health and Safety	
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	
Standard ESS8: Cultural Heritage	
Standard ESS10: Stakeholder Engagement and Information Disclosure	

3 Task Description

The Task Client (project owner / investor) is the State Water Management Authority (Wody Polskie), represented by the Regional Water Management Authority in Wrocław. The Task involves the construction of the Kamieniec Ząbkowicki Reservoir on the Nysa Kłodzka River. This river poses a significant flood risk. This is due, among other things, to hydrological conditions, the topography of the catchment area and the rapidly changing response of the catchment area to precipitation of varying intensities and durations. The planned reservoir will operate within the system of existing reservoirs on the Nysa Kłodzka (Topola, Kozielno, Otmuchów, Nysa), serving as the first element of the retention reservoir cascade in terms of water flow direction. Its operation will improve the water

management system in this part of the river basin, particularly in terms of increasing water retention, regulating flows, and mitigating the effects of flood waves or flood pulses.

The implementation of the Task draws on experiences related to floods with significant consequences in 1997, 2010, and the 2024 event, which was particularly severe, causing serious social and economic impacts in the analyzed region. Furthermore, this project is part of efforts related to climate change adaptation, particularly in the context of the increasing frequency and intensity of extreme events, such as flood waves or flood pulses and periods of drought.

The basic, approximate technical parameters of the planned reservoir, as determined at the current stage of task preparation, are summarized in the table below.

Table 5 Basic technical parameters of the Kamieniec Ząbkowicki Reservoir (conceptual stage)

Parameter	***Value***	***Unit***
Dam crest elevation	260.00	MASL (metres above sea level)
Minimum pool level / water level (MinPL)	249.00	MASL (metres above sea level)
Normal pool level / water level (NPL)	252.00	MASL (metres above sea level)
Maximum pool level / water level (MaxPL)	257.00	MASL (metres above sea level)
Extraordinary Pool Level (EPL)	258.00	MASL (metres above sea level)
Reservoir capacity / storage volume at NPL	54.0	million m^3 / Mm^3
Active storage capacity of the reservoir	23.0	million m^3 / Mm^3
Reservoir capacity / storage volume at MaxPL	103.0	million m^3 / Mm^3
Dam length	2,700.0	m
Maximum dam height	19.00	m
Surface area of the reservoir constantly covered with water	845	ha
Maximum surface area of the reservoir	1,045	ha

Parameters may be subject to minor changes during subsequent stages of design work.

3.1 Task location

The planned Task is located in southwestern Poland, in the Lower Silesian Voivodeship, within the Ząbkowice County, in the vicinity of the town of Kamieniec Ząbkowicki. The Task area is situated in the Nysa Kłodzka river basin, which is part of the Odra river basin. The Task location is shown in Fig. 1.

The Task is situated within the submontane valley of the Nysa Kłodzka River. The hydrological and geomorphological conditions of this valley are favorable for water retention and the ability to regulate river flows. At the same time, they contribute to flow variability and an increased risk of flash floods. The area designated for the Task encompasses a section of the river valley and adjacent lands, used primarily for agriculture (arable land and grassland), with some tree and shrub cover. There are also scattered buildings and local infrastructure in the vicinity .

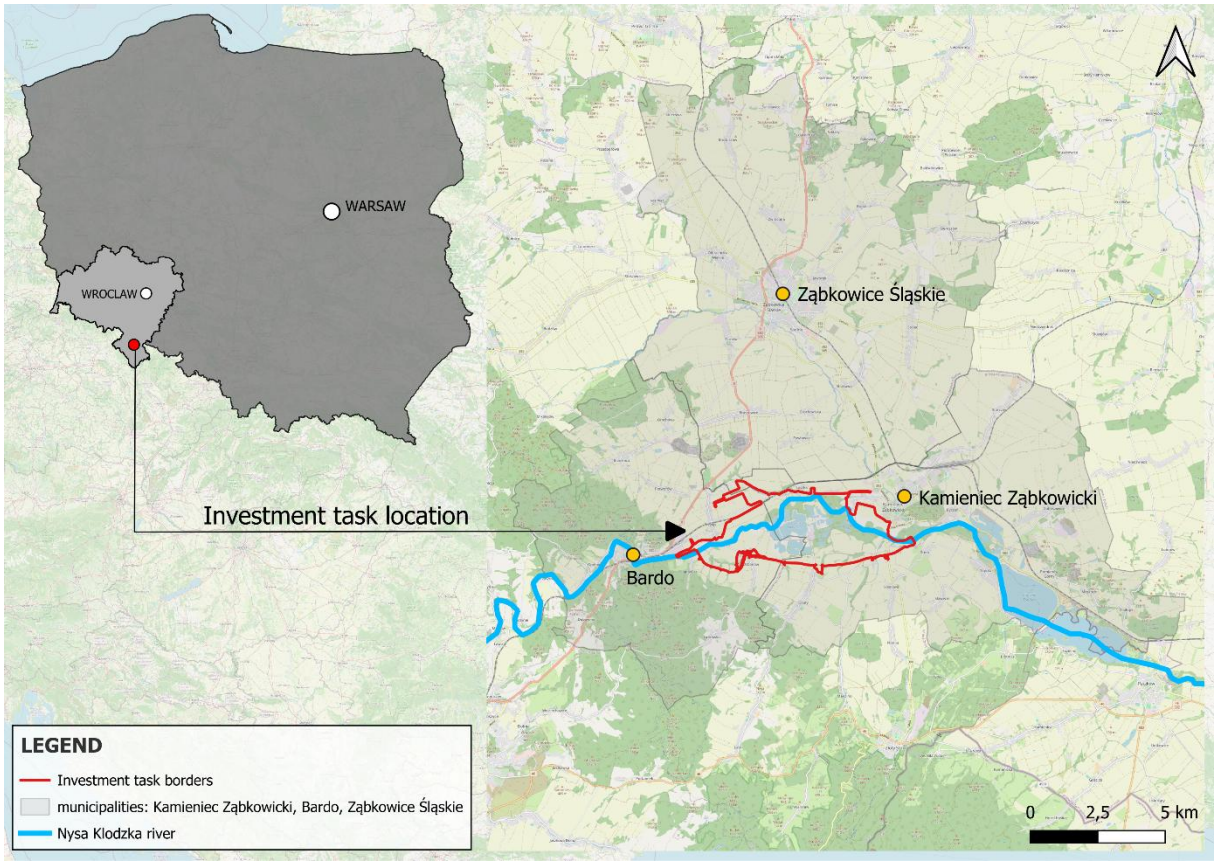


Figure 1: Location of the Task within the Nysa Kłodzka catchment area / watershed / river basin.
Source: Author's own work

3.2 Task Objectives

The task is designed as a multifunctional facility, the primary objective of which is to reduce flood risk by increasing retention capacity and improving the management and regulation of flows in the Nysa Kłodzka River. The implementation of the Task will contribute to enhancing the level of protection for areas located downstream of the planned reservoir and further along the river. At the same time, the Task will serve as a functional complement to the existing reservoir cascade (Topola, Kozielno, Otmuchów, Nysa), thereby enhancing the efficiency of the water management system in the Nysa Kłodzka catchment area.

Furthermore, a complementary objective of the Reservoir will be to improve the water balance and ensure rational management of water resources. In this regard, the Task is expected to mitigate the effects of drought by creating water reserves, balancing low flow / baseflow conditions in the river, and supporting compensatory releases to maintain the required flows in the Odra River. The task also aligns with climate change adaptation measures, contributing to increased resilience of the water management system in the catchment area against the effects of extreme events, particularly floods and droughts, whose frequency and intensity are on the rise.

Additionally, the Task creates an opportunity to harness the energy potential of the water flow, due to the construction of a hydroelectric power plant equipped with two Kaplan turbines, each with a capacity of approximately 1.45 MW. The investment also supports the development of recreational and tourism functions, and the reservoir may serve as a potential source of water supply for municipal and agricultural needs.

3.3 Scope of the Task

The scope of the Task covers the main design components (disciplines), including hydrotechnical, road, bridge, architectural, and utility systems (power, water and sewer, low-voltage networks).

This scope may be further refined during subsequent design phases.

The scope includes both elements directly related to the construction of the reservoir, as well as the accompanying infrastructure necessary for its operation and the integration of the task with the existing land use in the reservoir's surroundings.

For the purposes of this ESIA, it has been assumed that the scope of the assessment also includes related, auxiliary, and temporary facilities that may be necessary during the Task's implementation phase, even if their specific locations and parameters will only be determined in subsequent stages of investment preparation and work organization. These facilities include, in particular, the Contractor's construction back-up sites and social and technical facilities, storage yards for construction materials, temporary storage sites for excavated soil and waste, quarries or other sites for the extraction of materials for earthworks, maneuvering areas, equipment bases, and temporary access roads.

Impacts associated with these elements will be assessed in conjunction with the impacts of the Task's main components. In particular, potential noise and dust emissions,

increased construction vehicle traffic, temporary disruptions to local traffic, restrictions on access to selected properties, agricultural areas, roads, or recreational areas, as well as health and safety issues for the local community will be considered. Due to the proximity of the Góry Bardzkie Natura 2000 site, the assessment will also include potential impacts of construction-phase facilities on the subjects of protection of the site, i.e. natural habitats and animal species, as well as on the functioning of ecological corridors, including the Nysa Kłodzka valley, and the risk of habitat pollution resulting from construction works.

At this stage, due to the lack of final data regarding the organization of the construction site and the Contractor's support facilities, these impacts have been identified at a framework level. Their full identification, significance assessment, and detailed mitigation measures will be specified in ESIA Update II, the EIA report, and the Construction Environmental and Social Management Plan (C-ESMP), which will be developed prior to the Construction Contractor's mobilization.

The approximate scope of work, broken down by discipline, is presented in the table below.

Table 6 Scope of Work of the Task

No. SF	Discipline	Scope of work covered by the Task
1	Hydrotechnical	Construction of the main dam, including the shaping of the downstream area and associated structures; construction of main and emergency discharge facilities, including their discharge into the Nysa Kłodzka River; construction of a fish pass (fish ladder) to ensure ecological continuity of the watercourse; construction of flank dams and shaping of the reservoir basin and its banks; reconstruction of the river channel and diversion of tributary waters (Studew, Mszanica, Laskówka); construction of technical infrastructure related to the operation of the reservoir (including elements for harnessing the energy of water flow); construction of auxiliary facilities (boat ramp, wharf, drinking water intakes); demolition of structures interfering with the implementation of the Task.
2	Road	Construction of new and expansion of existing public roads; removal of road sections interfering with the Task; construction of internal roads serving the reservoir (allowing pedestrian and bicycle traffic); construction of maneuvering areas and parking lots; construction and reconstruction of pedestrian and bicycle infrastructure; construction and reconstruction of road exits; installation of drainage and road lighting systems; reconstruction of conflicting technical infrastructure; landscaping within road rights-of-way and associated works.
3	Bridge	Demolition and construction of engineering structures (bridges, viaducts / overpasses and culverts) related to the reconstruction and construction of the transportation system as part of the Task.
4	Architectural	Construction of an administrative building and a garage; construction of ancillary structures, including utility sheds, a trash shed, a transformer station (TRAFO), and a power generation unit.
5	Utility	Construction and reconstruction of water supply networks and sewage networks; construction and reconstruction of power grids / electrical networks for reservoir facilities; construction and reconstruction of telecommunications networks and telecommunications networks supporting the infrastructure.

4 Background Data

4.1 Socio-economic conditions

4.1.1 Impact Area

In accordance with ESS1, the Social Impact Area of the Task has been defined based on the nature and scale of the anticipated impacts on the local and regional communities. Three main zones have been identified:

a) **Direct Impact Area** – covers the Task implementation area with an area of approx. 10.35 km^2. This is the zone where land acquisitions occur and temporary property appropriations occur. Direct impacts affect the residents of the following localities: Przyłęk and Dzbanów (Bardo municipality) and Suszka, Ożary, Byczeń, Śrem, and Topola (Kamieniec Ząbkowicki municipality);

b) **Indirect impact area** / area of indirect influence – covers the remaining areas of the municipalities of Bardo and Kamieniec Ząbkowicki, located outside the immediate vicinity of the Kamieniec Ząbkowicki Reservoir. The impact in this zone is functional and transportation-related, associated with the reconstruction of road infrastructure (including conflicts with the planned S8 expressway), the relocation of utility networks, and the temporary traffic load on local roads from construction traffic;

c) **Reservoir Beneficiary Area** – covers areas located in the Nysa Kłodzka valley below the planned Reservoir. In this zone, the impact is positive and long-term, with the beneficiary population divided into two groups:
   - Direct beneficiaries**:** approx. 6,300 people residing in the areas of the Kamieniec Ząbkowicki municipality with the highest flood risk level, located directly below the Kamieniec Ząbkowicki Reservoir dam, for whom the Task constitutes the primary protection against flood waves;
   - Indirect beneficiaries: residents of urban centers and municipalities located further down the valley: Paczków, Otmuchów, and Nysa. The benefits for this group stem from the increased controllability of the cascade of reservoirs and the overall reduction in flooding.

d) **Potential Dam-Failure Inundation Area** – covers the areas in the Nysa Kłodzka Valley downstream of the Kamieniec Ząbkowicki Dam that could be inundated in the event of an uncontrolled release of water from the Reservoir, resulting either from a breach of the dam or the unauthorised full opening of the outlet gates. Although the likelihood of such events is considered very low, this area is included in the Social Impact Area in accordance with ESS1 and ESS4 (Annex 1: Safety of Dams), given the potentially severe consequences for downstream communities.
   Based on hydraulic modelling of the emergency scenarios, the area extends along the Nysa Kłodzka Valley from the Kamieniec Ząbkowicki Dam to the Nysa Reservoir. No significant impacts are expected downstream of the Nysa Reservoir, owing to the

retention capacity of the downstream reservoir cascade. The area partly overlaps with the Reservoir Beneficiary Area.

4.1.2 Beneficiary Area of the Reservoir

The beneficiary area has been defined as the zone of indirect, positive impact of the Task, covering the municipality of Kamieniec Ząbkowicki and the municipalities of the Nysa Kłodzka cascade located downstream of the planned Kamieniec Ząbkowicki Reservoir. Data regarding the municipality of Kamieniec Ząbkowicki are included in the data characterizing the direct impact area.

The municipality of Paczków (area 79.69 km^2) is the territorial unit most vulnerable to the effects of failures and uncontrolled water releases from upstream dams.

The municipality has a population of approximately 13,000. It is a community highly vulnerable to flood risks, as evidenced by the events of September 2024, when 2,500 people were evacuated and 90% of the municipality's area (10 out of 12 villages) was flooded.

The key beneficiaries of the positive impact of the planned reservoir are the educational infrastructure and the sanitation network. As a result of the 2024 flood, the municipal wastewater treatment plant and childcare facilities (kindergarten and nursery) were destroyed. The construction of the Kamieniec Ząbkowicki Reservoir will secure restored resources, guaranteeing the continuity of public services for families and the sanitary safety of the municipality.

The municipality of Otmuchów (approx. 6,500 residents) is characterized by a close connection between its economy and daily life and water management (the Otmuchów and Nysa reservoirs).

The municipality's eligibility as a beneficiary is based on a risk level exceeding historical maximums. In 2024, the flood extent was 25% greater than in 1997.

The dominant elements requiring protection are residential buildings and municipal infrastructure. As a beneficiary, Otmuchów gains protection for its dispersed residential developments, which in 2024 suffered numerous floods due to the inability of the Nysa Kłodzka cascade to absorb the peak flood wave.

The urban-rural municipality of Nysa (area: 217.6 km^2) is the most important administrative and economic center in the beneficiary zone. The municipality has a population of 54,030. As the county seat, Nysa is home to institutions of regional importance (hospital, government offices, transportation hub). Protecting this area extends beyond the municipality's borders, impacting the security of services for the entire Nysa County.

Experience from 2024 has shown that the city is a critical indirect beneficiary. Although the main flooding in the city occurred from the urban canal system and the Biała Głuchołaska River, the construction of the Kamieniec Ząbkowicki Reservoir is essential

for lowering water levels on the Nysa Kłodzka River. This prevents backwater in the city's canals and enables the efficient drainage of water from local tributaries, protecting the region's administrative center.

4.1.3 Potential Dam-Failure Indundantion Area

The Potential Dam-Failure Inundation Area covers the areas in the Nysa Kłodzka valley downstream of the Kamieniec Ząbkowicki dam that could be flooded in the event of an uncontrolled release of water from the Reservoir. Although the probability of such an event is assessed as very low, the area has been characterized in line with ESS1 and ESS4 (Annex 1, Safety of Dams), given the potential severity of consequences for downstream communities.

The extent of the area has been determined through hydraulic modelling of two emergency scenarios:

- Scenario 1 – unauthorized interference with the outlet control system, resulting in the sudden, simultaneous and full opening of all main outlet gates while the Reservoir is at its normal operating level of 252.00 m a.s.l. The peak discharge of the resulting wave is estimated at approx. 980 m^3/s;
- Scenario 2 – failure of the earth dam body due to uncontrolled seepage, piping and internal erosion, leading to a breach and uncontrolled emptying of the Reservoir. The scenario assumes that failure begins at the maximum water level of 257.00 m a.s.l., when the volume of water stored in the Reservoir is very large. The breach is assumed to erode the dam body down to approx. 244.00 m a.s.l., generating a wave with a peak discharge of approx. 1,200 m^3/s.

In both scenarios, the downstream reservoirs of the Nysa Kłodzka cascade were assumed to be at their normal operating levels at the time of the event, with retention capacity available up to their maximum permissible levels. This assumption reflects the position of the Kamieniec Ząbkowicki Reservoir as the uppermost reservoir in the cascade, which a flood wave reaches before it reaches the downstream facilities. The emergency wave would therefore be progressively retained and attenuated by the successive reservoirs, reducing both its volume and its peak discharge as it travels down the valley.

The largest inundation extent is expected on the reach between the Kamieniec Ząbkowicki Reservoir and the Topola and Kozielno reservoirs, and then on the reach between the Topola and Kozielno reservoirs and the Otmuchów Reservoir. On these reaches, the wave volume is still large, and the relatively small reservoirs of the cascade can reduce it only to a limited extent. The Otmuchów Reservoir, owing to its large capacity, would retain the major part of the remaining wave volume, and the residual part would be retained by the Nysa Reservoir. As a result, inundation between the Otmuchów and Nysa reservoirs would be considerably smaller, and no significant impacts are expected downstream of the Nysa Reservoir.

Exposure within the inundation area under each scenario is as follows:

	Scenario 1	**Scenario 2**
Initial water level	252.00 m a.s.l. (normal operating level)	257.00 m a.s.l. (maximum water level)
Peak discharge	approx. 980 m^3/s	approx. 1,200 m^3/s
Buildings within the inundation area	328	509
of which residential buildings	119	206

The largest inundation extent is expected in the municipalities of Kamieniec Ząbkowicki (Ząbkowice County, Lower Silesian Voivodeship) and Paczków (Nysa County, Opole Voivodeship), on the reaches upstream of and around the Topola and Kozielno reservoirs, and in the municipality of Otmuchów (Nysa County, Opole Voivodeship), upstream of the Otmuchów Reservoir. Downstream of the Otmuchów Reservoir, the inundation extent would be considerably smaller.

The hydraulic analysis quantifies exposure in terms of the number of buildings. The number of residents living within the inundation area, the list of affected localities, and the facilities relevant to the safety of the population and to emergency response (such as schools, kindergartens, health and social care facilities, evacuation routes and utility infrastructure) will be determined in the Emergency Preparedness Plan. This will be done by overlaying the inundation maps with population register and land use data, before the Reservoir is commissioned. The downstream reservoirs of the Nysa Kłodzka cascade are also located within the area.

The inundation area largely overlaps with the Reservoir Beneficiary Area. The communities that will benefit from improved flood protection are therefore also the communities exposed to the residual risk associated with the dam. They are the key audience for dam safety information, early warning and evacuation procedures.

4.1.4 Land Use and Ownership Structure in the Reservoir's Impact Area

The planned Kamieniec Ząbkowicki Reservoir will cover an area of approximately 10.35 km^2, of which 3.76 km^2 will be within the boundaries of the Bardo municipality, and 6.59 km^2 within the Kamieniec Ząbkowicki municipality. The valley between Bardo and Kamieniec Ząbkowicki, where construction is planned, is only minimally developed. This is largely due to gravel extraction that has been ongoing since the 1950s, which has devastated the agricultural land. The towns of Bardo and Kamieniec Ząbkowicki are located at the western and eastern ends of the valley, respectively, and lie outside the Kamieniec Ząbkowicki Reservoir basin. The village of Suszka lies on the northern, high bank of the valley, while the villages of Dzbanów and Ożary are situated to the south - all of them located outside the reservoir basin. County roads connecting these towns run around the area of the planned reservoir, and National Road No. 8 runs along the western

edge of the area. A railway line runs partially on an embankment, diagonally across the valley from Suszka to Przyłęk.

Land within the future reservoir area varies in terms of ownership. The following groups of owners have been identified: private owners (individuals), the State Treasury represented by the RZGW, the State Forests, Ząbkowice County, the municipality of Bardo, the municipality of Kamieniec Ząbkowicki, and MRM "Byczeń." This company is actively purchasing land for the Przyłęk–Pilce deposit under its aggregate/gravel extraction concession.

The land ownership structure in the direct impact area / area of direct influence of the reservoir is presented in the table below.

Table 7 Summary of land Acquisition and Resettlements Impacts.

Category	Scale of Impact
Total area of land permanently acquired	**1,427 ha**
Number of plots permanently acquired	**1,168**
Area of land temporarily occupied	**80 ha**
Number of plots temporarily occupied	**250**
Total number of Project Affected Persons (PAPs)	**250**
Households requiring physical relocation	**2**
Households affected by economic displacement	**7**
Households subject to significant impacts	**19**
Affected residential buildings	**3 (including 2 occupied households requiring relocation)**
Affected agricultural households/farms	**19**

According to the current design concept, the Task area includes 3 residential houses, one of which is uninhabited—used for agricultural and recreational purposes. This means that during the reservoir construction phase, it will be necessary to perform physical displacement of the residents of the two inhabited residential properties and acquire the third developed property without the need for relocation.

In the valley, near the former village of Pilce, there is a mine and an aggregate processing plant owned by MRM "Byczeń." Mining operations are conducted in the area east of the Ożary–Suszka road. MRM "Byczeń" holds a concession covering the Przyłęk–Pilce deposit and is carrying out successive land purchases under this concession. The result of several decades of exploitation is extensive agricultural degradation of the valley terrain—more than half of the area of the future reservoir basin is covered by water-filled ponds of past

gravel extraction. These ponds are used by the Polish Angling Association and for recreational purposes by residents, mainly from neighboring towns.

The remains of the village of Pilce are located within the planned reservoir basin. The village's buildings were destroyed because of the 1997 flood and the subsequent relocations and demolitions. The houses have been demolished; within the former village of Pilce, there are no visible ruins of buildings or exposed foundations. However, some of the archaeological sites identified within the area of the planned reservoir are located within the former village and its surroundings. Detailed information on this subject is presented in Chapter 4.2.3.

The areas of the future reservoir where aggregate extraction has not yet begun consist of agricultural land: arable fields and pastures used for growing cereals, forage crops (mainly corn), and rapeseed. The only notable forest community is the floodplain forest growing on both banks of the Nysa River in the western part of the planned reservoir.

Across the entire Bardo municipality, agricultural land covers 3,053 ha out of a total municipal area of 7,341 ha, while forests cover 3,544 ha (48.28% of the area, the highest forest cover rate in the county), of which 3,438 ha are public forests. Within the boundaries of the town of Kamieniec Ząbkowicki, forest land covers 152.50 ha, of which 133.49 ha is publicly owned (State Treasury – State Forests 107.74 ha, Agricultural Property of the State Treasure 17.11 ha, municipality 8.17 ha), and 19.01 ha is owned by private individuals.

The regional context indicates that the average total land area per farm in the Lower Silesian Voivodeship is 15.82 ha, and the average agricultural land area is 14.59 ha (2020 General Agricultural Census).

A notable feature of the area is the high degree of post-mining degradation—more than half of the future reservoir is agriculturally devastated and covered with ponds from depleted gravel extraction pits. Legally, these areas may still be listed in the registry as agricultural land, but their actual productive value is negligible or nonexistent.

The table below presents the land use structure within the reservoir's direct impact area.

Table 7 Land use structure in the direct impact area

Land use according to the Land and Property Register (EGiB)	Area [ha]	Share (%)
Built-up and urbanised land (residential areas, industrial areas, other built-up areas, urbanised undeveloped areas or areas under development, recreational and leisure areas, roads, railway areas, mining areas)	47	3%
Agricultural land (arable land, permanent meadows, permanent pastures, orchards, built-up agricultural land, land under ponds, land under ditches, wooded and shrub-covered land on agricultural land, wasteland)	1037	73%
Forest land, wooded land and shrubland (forests, wooded land and shrubland)	71	5%
Miscellaneous land	10	1%
Land under water (land under flowing surface waters, land under standing surface waters)	129	9%
Mining areas (areas covered by an extraction licence)	133	9%
Total	1427	100%

4.1.5 Technical infrastructure and public services

4.1.5.1 Water supply and wastewater disposal systems

The core component of the water supply infrastructure in the area of the planned Kamieniec Ząbkowicki Reservoir is an infiltration water intake consisting of two well complexes. These intakes supply drinking water to the municipalities of Kamieniec Ząbkowicki, Bardo, and Złoty Stok. In 2001, the total capacity of both well complexes was 6,720 m^3/d.

The intake is of the infiltration type—groundwater in the Nysa Kłodzka Valley remains in close hydraulic connection with the river water, and changes in the river's water level result in a direct change in the water table level in the wells. The wells utilize the first aquifer, typically found at a depth of 2–3 m. The intake's capacity decreases during low water levels. Consequently, in recent years this has led to problems in ensuring water supply for the municipality of Złoty Stok (verbal information from the Mayor of Złoty Stok).

The water being abstracted contains excessive levels of iron and manganese. Consequently, the water is treated to remove iron and manganese before being supplied to the network. Both well complexes are located at the bottom of the Nysa Kłodzka Valley, within the planned reservoir area. Group I is in the upper part of the intake area, toward the village of Ożary; the wells are situated at a depth of 10–15.5 m. Well Complex No. II is

located closer to the planned main dam, and its wells reach depths of 16–18 m. As part of this complex, two additional new wells were completed - Both well complexes are located within the task's direct impact area, which means they must be decommissioned prior to the reservoir's construction phase and a replacement drinking water supply source must be established for the municipalities they serve.

In addition to the public water supply system, individual water intakes such as household wells operate within the Kamieniec Ząbkowicki Reservoir's indirect impact area. Their number and location within the municipalities of Bardo and Kamieniec Ząbkowicki are unknown at this stage of the project.

Regarding wastewater disposal, in the municipality of Bardo, only 43.2% of residents used the sewage collection system (2019 data), while in the municipality of Kamieniec Ząbkowicki, the figure was 64.5%. This means that a significant portion of the residents in the task's area of influence use on-site sanitation systems that are not connected to the public sewage network.

4.1.5.2 Technical network infrastructure

High-voltage 110 kV lines and medium-voltage 20 kV lines run through the area of the planned reservoir. The distribution network operator in this area is Tauron Dystrybucja Spółka Akcyjna.

Sections of the power infrastructure that conflict with the planned reservoir will require reconstruction, which will entail the introduction of restrictions on the use of real estate (permanent or temporary) along the new routes. The routes of the new lines have not yet been finally approved - design work is underway at the time of this study's preparation.

The area of the planned reservoir is not covered by the gas pipeline network.

4.1.5.3 Railway infrastructure

Railway line No. 276, Wrocław Główny–Międzylesie, which serves both passenger and freight traffic, runs through the municipalities of Bardo and Kamieniec Ząbkowicki. The line runs diagonally across the valley, from Suszka to Przyłęk, partly on an embankment. The railway line is not located within the planned reservoir area; however, a potential conflict with reservoir structures has been identified at the point where the line intersects with the Studew Stream relief channel, which drains floodwaters to the Nysa Kłodzka River outside the reservoir area. The conflict will not affect the operation of the railway line, as it concerns the construction of a culvert beneath the railway line. There will be no impact on train traffic.

In the municipality of Kamieniec Ząbkowicki, Line No. 276 intersects with Line No. 137 Katowice–Legnica. The Kamieniec Ząbkowicki station handles both passenger and freight traffic, including the transport of aggregates from quarries in the Ząbkowice County. The

low technical condition of Line No. 276 has long resulted in numerous speed restrictions. In 2024, PKP Polskie Linie Kolejowe (State Railways) signed contracts for the revitalization of the line for a total amount of over 117 million PLN from the National Recovery Plan and the state budget, covering, among other things, repairs to bridges and viaducts, replacement of traffic control equipment at over 60 railroad crossings, and the renovation of the overpass over Kolejowa Street at the Kamieniec Ząbkowicki station.

4.1.5.4 Road network and the planned S8 expressway

The primary element of the road network with supra-local significance is National Road No. 8, which runs through the territory of both municipalities and serves as the main connection between the Kłodzko Valley and Wrocław. National Road No. 8 serves both transit and local functions, which generates significant traffic volume. The road runs along the western edge of the planned reservoir.

The municipality of Kamieniec Ząbkowicki also has access to provincial roads VR 382 and VR 390, providing connections to Nowa Ruda, Ząbkowice Śląskie and Paczków. County roads run around the site of the future reservoir, connecting the towns located on its outskirts. For the reservoir, the relocation of short sections of county roads has been planned due to an anticipated collision with the reservoir basin - the collision concerns a section with a total length of approx. 4 km of county road No. 3149 (Przyłęk-Dzbanów-Ożary).

Neither of the two municipalities has dedicated bicycle lanes. The municipality of Bardo has an extensive bicycle infrastructure intended solely for recreational use.

A major change in the region's transportation network will be the construction of the S8 Wrocław–Kłodzko expressway, with a total length of approximately 86 km, divided into six construction sections. From the perspective of the reservoir's construction, the following sections of this road are significant:

- **The Ząbkowice Śląskie Północ–Bardo section** (approx. 14 km long) is at a more advanced stage of preparation than the Bardo–Kłodzko section. In 2025, an application was submitted to the Lower Silesian Province Governor for a decision granting permission to carry out the road construction (PfRI). The route runs through the municipalities of Ząbkowice Śląskie and Bardo along a new alignment, with two interchanges: Ząbkowice Śląskie East and Bardo. This section does not directly enter the reservoir's direct impact area; however, the process of acquiring property for the road may compound the effects of the reservoir's construction on the same group of residents.
- **The Bardo–Kłodzko section**, being implemented by the GDfNRM Wrocław Branch, is at an earlier stage. A Technical-Economic-Environmental Study (TEES) is currently being prepared, along with materials for the environmental permit. This means that as of the date of this report, this project is in the phase preceding detailed design and the identification of properties to be acquired. As part of the

TEES, route alternatives - tunnel-free and tunnel-based - derived from an earlier study of the Kłodzko–Ząbkowice Śląskie section are being analyzed. The contractor for the TEES is required to incorporate the reservoir's design solutions when developing the road route alternatives. The detailed route of the S8 on the Bardo–Kłodzko section in relation to the reservoir area - including any potential conflict or lack thereof - requires further clarification after the completion of the TEES. Completion of the entire S8 route between Wrocław and Kłodzko is planned for 2028–2033, with the Bardo–Kłodzko section, as it is currently only in the TEES preparation phase, to be implemented at a later date.

4.1.5.5 Social Services

Each municipality has two kindergartens: in Bardo—the Public Kindergarten with a branch in Przyłęk and the Non-Public Kindergarten of the Sisters of St. Hedwig in Brzeźnica; in Kamieniec Ząbkowicki - Kindergarten No. 1 and Kindergarten No. 2. In 2024, 133 children attended kindergartens in the municipality of Bardo in 10 classes, and 163 children attended kindergartens in the municipality of Kamieniec Ząbkowicki in 8 classes; in both cases, all available spots were fully occupied.

Primary education is provided in Bardo at the School and Preschool Complex and the Special SP at the SCH in Opolnica (a total of 300 students in 20 classes), and in Kamieniec Ząbkowicki at Bolesław Chrobry SP No. 1 and SP No. 2 (a total of 441 students in 24 classes). The municipality of Bardo does not have a public secondary school - the only institution at this level is the Special School Preparing for Work at the SCH (11 students). Hence, young people commute to schools in other towns.

The municipality of Kamieniec Ząbkowicki serves as a local educational center, offering education at the Julian Lubieniecki Technical School (75 students) and at a post-secondary school (22 students).

All educational institutions are located outside the reservoir's direct impact area.

A non-public healthcare facility (clinic) operates in Bardo, supplemented by private dental offices. According to 2019 data, there were a total of 2,643 residents for the two clinics operating in the municipality. A unique resource in the support infrastructure is the "Nadzieja" Crisis Intervention Center, which provides psychological and legal support to people in crisis situations and victims of violence.

In Kamieniec Ząbkowicki, there is a non-public healthcare facility (clinic) and dental offices. Both towns have pharmacies (3 in Bardo, 2 in Kamieniec Ząbkowicki) as well as private medical and physical therapy practices.

All healthcare facilities are located outside the reservoir's direct impact area.

4.1.6 Sources of livelihood and the local economy

The local labor market is linked to the ongoing phenomenon of semi-urbanization - the economy relies predominantly on industry and construction (34.7% of the workforce) as well as services, trade, and transportation (19.3%). Agriculture, forestry, and fishing provide a livelihood for 15.7% of the economically active population. High occupational mobility is characteristic; the negative net commuting balance (particularly in the municipality of Bardo, where 499 people commute to work outside the municipality) indicates that a significant portion of household income is generated in external, regional labor markets, access to which is provided by DK8 and railway line No. 276. That means that a significant portion of the residents operate according to the rhythm dictated by external labor markets. From the perspective of the Task's impact assessment, this indicates that for many people affected by the Task, agriculture or local activities do not constitute the sole or the primary source of livelihood.

Based on data regarding the 1,806 registered unemployed individuals in the Ząbkowice County, the breakdown of the unemployed population is as follows: - the largest group consists of people aged 35–44 (458 people, or 25.4%); the second largest group consists of people aged 25–34 (436 people, or 24.1%); followed by people aged 45–54 (358 people, or 19.8%); 55–59 years old – 214 people, i.e., 11.8%, 18–24 years old – 180 people, i.e., 10%), and those aged 60–67 – 160 people, i.e., 8.9%. Of the total number of 1,806 registered unemployed, the vast majority - 1,619 people, or 89.6% - are individuals with prior work experience; those without work experience number 187, or 10.4%. Among the unemployed with experience, the largest groups are those with 1 to 5 years of experience - 451 people, or 27.9% - and up to 1 year - 373 people, or 23.0%, followed by those with 11–20 years of experience—304 people, or 18.8%, 6–10 years (302 people) – 302 people, or 18.7%, 21–30 years – 140 people, or 8.6%, and 31 years and older – 49 people, or 3.0%.

The main business entity whose operations are directly linked to the investment area is MRM "Byczeń." The mine manages a processing plant and mining fields in the Przyłęk–Pilce area. Activities conducted within the reservoir's direct impact area will mostly cease before construction begins due to the depletion of available deposits. The exception concerns Deposit "C," the exploitation of which is planned for a period overlapping with the reservoir's construction period. The exploitation of this deposit is expected to be completed before the reservoir is filled.

The areas of the future reservoir currently used for agriculture consist of arable fields and pastures dominated by cereal crops, forage crops—mainly corn—and rapeseed.

In the agriculture, forestry, hunting, and fishing sectors, 15.7% of the economically active residents of both municipalities are employed. In the REGON registry, only 10 entities in each municipality declare activity in this sector, indicating the dominance of individual farms. The total area of agricultural land in the municipality of Bardo is 3,053 ha, with a

total municipal area of 7,341 ha. The average agricultural land area per farm in the Lower Silesian Voivodeship is 14.59 ha (based on the 2020 General Agricultural Census).

The socio-economic survey of project-affected persons identified two main groups of landholders.

The first group consists of family-operated agricultural holdings ranging in size from approx. 15 to 70 ha, which is above the regional average. These holdings farm both owned and leased land. In some cases, owned and leased parcels function as a single integrated production unit. Production is dominated by field crops, primarily cereals, maize, oilseed rape and sugar beet. Some holdings keep livestock and rely on their own land for feed production and grazing, including meadows and pastures. For most of these households, agriculture is the primary source of livelihood or accounts for more than half of total household income. In some households, agricultural income is supplemented by off-farm employment, pensions or other social transfers. The holdings participate in Common Agricultural Policy support schemes, including direct area payments, eco-schemes and agri-environment-climate commitments. Their operations depend on agricultural drainage networks, subsurface drainage, water intakes and field access tracks. For many families, land is not only a means of production but also intergenerational family wealth and collateral for credit, and farming practices are tied to long-standing family traditions.

The second group consists of owners of parcels for whom the affected land is a minor part of their holding. These are mostly elderly and pre-retirement persons whose livelihoods rely primarily on state pensions, off-farm employment and farming on land outside the footprint. Income derived from the affected parcels is marginal or non-existent. This group includes persons identified as vulnerable, such as seniors, persons with disabilities and social assistance beneficiaries.

The economic situation of farmers reflects the difficult circumstances facing this occupational group nationwide. The median monthly income per person on farms in Poland is 2,200 PLN - which is only 66.5% of the average for this group (3,309 PLN) and the lowest figure among all socio-professional groups, although the high average is inflated by a small group of large-scale farms. Farmers' monthly expenditures per person amount to PLN 1,311, compared to an average of PLN 1,878. Farmers, as the only occupational group, did not report any improvement in their subjective assessment of their financial situation in 2024; they point to rising production costs amid falling purchase prices, the lack of guaranteed prices making investment planning impossible, and the fear of having to cease operations. This context is relevant for assessing the impacts of the Task: the loss of land by farms operating at the break-even point may be significant for them even when the area being taken over is small.

4.1.7 Demography and Social Structure

4.1.7.1 Population Profile

In the first half of 2025, the municipality of Kamieniec Ząbkowicki had a population of 7,326 (4,273 in the urban area and 3,053 in rural areas), while the municipality of Bardo had 4,910 residents. Approximately 6,300 people live in the immediate impact zone of the reservoir, in the section extending to the Topola reservoir.

In both municipalities, there is a slight predominance of women: the female to male ratio is 108 in the town of Kamieniec Ząbkowicki and 104 per 100 men in the municipality of Bardo. The gender imbalance is significantly more pronounced in the post-working-age group - in the Bardo municipality, this group (totaling 1,310 people, accounting for 26.4% of the population) consists of 856 women and 454 men. Women are older in both municipalities: the average age of women is 44.8 years in Kamieniec Ząbkowicki and 46.5 years in Bardo, compared to 42.6 and 42.8 years, respectively, for men. The higher proportion of women among the older population may be associated with specific considerations, including a higher likelihood of living alone, lower retirement incomes, and limited mobility. This has direct implications for the design of consultation and assistance activities within the framework of the Task.

The demographic burden index, i.e., the ratio of the number of people of non-working age (children aged 0–14 and seniors aged 65+) to the number of people of working age (15–64) is 70.9 for the municipality of Kamieniec Ząbkowicki and 71.0 for the municipality of Bardo—with a national average of approximately 72 (2024).

Both municipalities are experiencing a negative natural increase that has been worsening over time. In the municipality of Kamieniec Ząbkowicki, it totaled -31 people in the first half of 2025; historical data show a rapid worsening of the phenomenon: from -5 in 2018 through -59 in 2020 to -72 in 2021. In the municipality of Bardo, the natural increase in 2024 was -69 (a rate of -14.05 per 1,000 inhabitants, compared to -5.0 for the province and -4.2 for the country), and the net migration was -27. GUS forecasts for the Ząbkowice County predict a steady further decline in population, in line with the nationwide trend.

4.1.7.2 Households and Standard of Living

In the Kamieniec Ząbkowicki municipality, there are 1,416 households with an average size of 3.11 people, and in the Bardo municipality, there are 1,548 households with an average of 3.15 people. Small households - those with one or two people - dominate in both municipalities. Single-parent families headed by women constitute a distinct group - 310 in the municipality of Kamieniec Ząbkowicki and 341 in the municipality of Bardo.

The technical standard of housing is relatively high: 82.9% of homes in Bardo and 92.5% in Kamieniec Ząbkowicki have a bathroom, 71.7% and 79.1% have central heating, respectively, and 96.61% and 98.89% have access to running water. A clear weakness remains the sewage network, which is used by only 43.2% of Bardo's residents and 64.5%

of Kamieniec Ząbkowicki's residents, indicating widespread use of on-site sanitation systems.

Both areas exhibit characteristics of semi-urbanization: a high standard of housing infrastructure and an urban-style lifestyle, accompanied by an outflow of young residents and a negative migration balance. Semi-urbanization here does not result from an influx of new residents but is the effect of internal modernization amid ongoing depopulation.

The baseline survey identified two households residing in residential structures located within the footprint of the Kamieniec Ząbkowicki Reservoir. Both households are subject to physical displacement.

Given the very small number of affected households, detailed disaggregated data—such as household demographic composition, age and health status, livelihood sources, financial liabilities, on-site economic activities, and prospective relocation sites—have been omitted from this section. This redaction is necessary to eliminate the risk of indirect re-identification of the affected households in accordance with data privacy regulations.

4.1.7.3 Social Capital and Local Engagement

The social capital of both municipalities is based on strong, informal neighborly ties typical of small rural and urban-rural communities. PORC surveys indicate that 77% of residents in such areas do favors for one another, while only 7–8% report open neighborly conflicts, compared to 13% in larger cities. The social profile of the area—featuring farmers, people with basic vocational education, and middle-aged individuals—corresponds to groups with the highest rates of close neighborly relations.

However, the strategic documents of both municipalities point to residents' passivity and reluctance to actively participate in public life as weaknesses of both communities. This phenomenon has direct implications for the public consultation process: a low propensity for initiative may result in apparent acceptance of the Task, despite a lack of actual engagement—which was classified as a high-significance risk in the social impact assessment. At the same time, 71% of respondents express trust in local authorities, which constitutes a resource conducive to building dialogue.

Cultural and sports activities are institutionalized and limited in scope. In 2024, the municipality of Kamieniec Ząbkowicki hosted 57 cultural events with an attendance of 2,090 participants, while the municipality of Bardo hosted 25 events with an attendance of 1,200 people. Sports participation is heavily dominated by men: in the municipality of Bardo, out of 195 active participants, 182 were adult men and 13 were adult women.

In both municipalities, women are statistically better educated than men: 20.0% of women have a college degree, compared to 11.8% of men, among whom basic vocational education predominates (31.2%). This difference has practical implications for selecting the form of communication in the consultation and information process conducted as part of the Task.

4.1.8 Vulnerable groups

ESS1 and ESS5 impose an obligation to identify vulnerable groups and providing them with proportionally greater support at all stages of the task. Among the distinguishable categories of social vulnerability in the municipalities of Bardo and Kamieniec Ząbkowicki, two groups requiring special attention were identified in this assessment: older adults (65+) and people with disabilities. These groups are vulnerable to a combination of adverse impacts, a more difficult financial situation, and significant psychosocial stress associated with a change in environment.

The characteristics of each identified group are presented below:

1. Seniors 65+

A total of over 2,000 seniors reside in the municipalities of Bardo and Kamieniec Ząbkowicki, with a clear predominance of women (who often live alone and have lower incomes).

Low pension incomes, exacerbated by rising energy and medication costs, force them to rely on support from the OPS (Social Welfare Centre). Seniors often live in buildings constructed before 1960, characterized by low energy efficiency and architectural barriers. A key challenge is digital exclusion—only 36–55% of older adults use the internet, which limits the effectiveness of e-government services and online communication.

2. People with disabilities

The disability rate in the municipalities of Bardo and Kamieniec Ząbkowicki is 130.3 and 100.3 people per 1,000 residents, respectively. Households in these areas have an income that is 15.4% lower than the national average, and more than half of their budgets depend on social benefits. High medical and rehabilitation costs limit investment opportunities, resulting in poorer access to technology (laptops) and transportation. An additional barrier is posed by architectural deficiencies in public spaces (lack of ramps, elevators), which effectively limit this group's participation in consultation processes and their ability to independently handle official matters.

4.2 Environmental Conditions

This section of the report presents a description of the baseline environmental conditions within the Task Area. The analysis covers the abiotic and biotic conditions of the area and was prepared based on available source data and reference materials.

4.2.1 Physical environment

4.2.1.1 Climate and meteorological conditions

The Task is located in southwestern Poland, in the Lower Silesian Voivodeship, in the Nysa Kłodzka Valley and near the Sudeten Foothills. The climate of this area is temperate transitional, with a distinct influence of air masses flowing in from both the west (Atlantic air) and the east (continental air).

The average annual air temperature is approximately 8–9°C. The warmest month is usually July, when average daily temperatures reach around 22–24°C. In contrast, the coldest month is January, with average temperatures around –2 to –3°C. The growing season is relatively long, lasting an average of 200–220 days a year, which is favorable for agriculture and horticulture.

Annual precipitation averages 600–700 mm, with the heaviest rainfall occurring in summer, especially in June and July, often in the form of intense thunderstorms. In winter, precipitation is lighter and often falls as snow, and snow cover usually lasts only briefly.

In recent decades, the Sudeten Foothills and the Nysa Kłodzka Valley have been increasingly affected by drought-related phenomena, manifested by prolonged periods without precipitation and increased surface evaporation, leading to a growing soil moisture deficit in agricultural and meadow areas. These phenomena result in a reduction in the catchment area water retention capacity - soil with reduced infiltration loses its ability to absorb rainfall, which intensifies surface runoff. Consequently, the heavy storm rains characteristic of this area during the summer season generate an increased risk of local flooding.

The meteorological conditions of the area are influenced by the proximity of the Sudetes, which causes local variations in temperature, humidity, and wind directions. Winds from the west and southwest are the most common. Throughout the year, there are also periods of fog, particularly in the Nysa Kłodzka Valley, mainly in the fall and winter.

The climatic conditions in the Task area can be described as mild and moderately humid, with warm summers, moderately cool winters, and a distinct seasonal pattern. In recent years, however, extreme weather events have become increasingly common - including both prolonged droughts and heavy rainfall - which highlights the importance of the Task as a component of local water retention and protection against the effects of both drought and flooding.

4.2.1.2 Geology, Hydrogeology, and Geomorphology

The geological structure of the area covered by the Task is characterized mainly by Quaternary formations of fluvial origin that fill the Nysa Kłodzka valley. These sediments occur primarily as fluvial sands and gravels with good permeability, locally covered by a layer of fine-grained formations, such as silt, clay, and alluvial deposits. The bedrock beneath these sediments consists of older Tertiary formations and Paleozoic rocks.

From a geomorphological perspective, this area constitutes a fragment of a system of river terraces and a floodplain, shaped by long-term fluvial processes associated with the activity of the Nysa Kłodzka River. The terrain is relatively gentle, and the dominant landforms are flat terrace surfaces composed of sandy-gravelly materials of variable thickness.

The hydrogeological conditions are characteristic of river valleys filled with sandy-gravel formations. These sediments form permeable aquifers that remain in hydraulic connection with the surface waters of the river valley. The groundwater table occurs in Quaternary formations, and its level depends on infiltration recharge and fluctuations in river water levels.

The geological and geomorphological character of the area creates favorable conditions for obtaining soil materials directly within the Task area. The geological conditions, as well as the rheological and strength properties, allow for the use of local soils to carry out earthworks related to the task. This approach reduces the need to transport materials from outside the task area and promotes the rational use of local resources. It is also in compliance with Polish construction law.

4.2.1.3 Mineral Deposits

According to spatial data from the MIDAS Mineral Resources Management and Protection System, there are documented deposits of natural aggregates in the Task area: Przyłęk – Pilce and Pilce – Suszka III.

The Przyłęk – Pilce deposit covers an area of 931.81 ha. Its thickness ranges from 2.0 m to 11.7 m. The average thickness is 6.4 m. It covered with layer built of clays, loams, silts, and sands, as well as Holocene alluvial deposits and river sands, as also indicated by soil and agricultural maps. The thickness of the overburden ranges from 0.0 m to 4.0 m. The deposit is one of the largest in terms of reserves in the Lower Silesian Voivodeship. The deposit is currently being mined pursuant to Decision No. 4/E/2018 of the Marshal of the Lower Silesian Voivodeship, dated May 21, 2018, valid until June 12, 2058.

The deposit is operated by the “Byczeń” Mineral Resources Mine. Due to the advanced stage of mining operations, it is anticipated that exploitation will be completed by the time construction of the Kamieniec Ząbkowicki Reservoir begins, and the overburden will be used for reclamation and deposited in the post-mining quarry as an internal spoil pile.

The Pilce – Suszka III gravel deposit covers an area of approximately 37 ha, and the current resource volume is 444,000 tons. The deposit is not currently being mined.

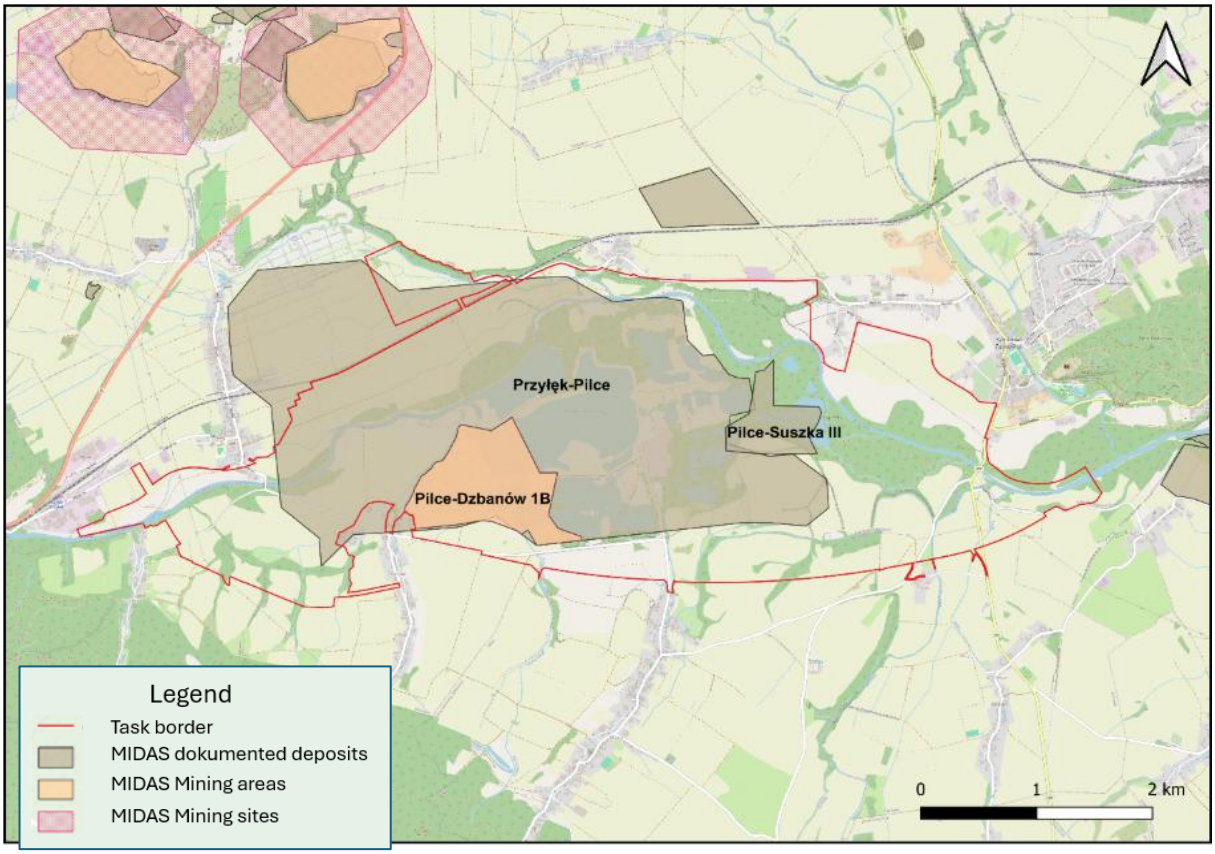


Figure 2: Deposits, mining areas, and mining sites in the task area
Source: Compiled by the author

4.2.1.4 Soils

The Task area is characterized by diverse soil conditions related to the geomorphology of the Nysa Kłodzka Valley and land use patterns in the region. The area features both soils of high agricultural suitability, represented by very good and good wheat complexes, as well as poorer soils, including rye complexes and grasslands of varying productive value. River floodplains, formed by the accumulation of alluvial sediments, constitute the largest share within the task area. There are also brown soils with moderate agricultural suitability, as well as, podzolic, and pseudopodzolic soils developed on sandy formations, which typically have lower agricultural productivity than brown soils.

The characteristics of the soils in the analyzed area also necessitate appropriate handling of the topsoil layer during the task's implementation. Due to the implementation of the Task, part of the soil will be affected by earthworks. Prior to the commencement of work, it is planned to remove and temporarily store the humus layer, which will be used during the development and reclamation of the areas covered by the task.

4.2.1.5 Surface and Groundwater

The Task area is located in the Nysa Kłodzka river basin, a left-bank tributary of the Odra. The river originates in the Śnieżnik Massif and, in the analyzed section, flows west-east through a tectonically formed valley, exhibiting the characteristics of a lowland river. The Task's catchment area / watershed / river basin also includes its tributaries: the Studew, Potok Ożarski, Mąkolnica, and Budzówka. According to the Water Basin Management Plan for the Odra River, the Task area is located within the boundaries of five unified surface water bodies (USWB): Studew (RW600003123149), the Nysa Kłodzka from Ścinawka to the point where the Młynówka Pomianowska branches off (RW60000512333), the Ożarski Stream (RW600003123169), Mąkolnica (RW600003123189), and Budzówka (RW60000312329). The Studew, Nysa Kłodzka, and Budzówka are natural water bodies, while the Ożarski Stream and Mąkolnica are heavily modified water bodies. For all USWBs, a risk of failing to achieve environmental objectives has been identified.

Characterisation of River Water Bodies Based on the 2nd Update of the River Basin Management Plans and the State Environmental Monitoring Programme

The information characterising the River Water Bodies (RWBs) presented in this chapter was obtained from the annexes to the 2nd update of the River Basin Management Plan for the Oder River Basin (2nd aRBMP) (Journal of Laws of 2023, item 325) and from the results of the State Environmental Monitoring Programme (PMŚ) for 2020, 2021, 2023 and 2024 (data from the file Klasyfikacja_ocena_2019-2024_RW; https://wody.gios.gov.pl/pjwp/publication/RIVERS/88).

The area of potential impact of the Task includes one RWB of the Nysa Kłodzka River, classified as type RsW_krz (medium-sized river on a silicate substrate): Nysa Kłodzka from Ścinawka to the point where the Młynówka Pomianowska branches off, PLRW60000512333. These are rivers with a moderate gradient and considerable flow velocity, with relatively well-oxygenated water. They are characterised by a considerable diversity of hydromorphological units, including riffles, pools, runs, glides, backwaters and others. The bed substrate is dominated by gravel (mesolithal, microlithal and akal) and sand (psammal), while stones occur mainly in gorge sections and in the vicinity of riffles. Sandy and muddy sediments (psammal and pelal) predominate in backwaters and deeper pools with slower currents. Habitat diversity is determined by the presence of coarse woody debris and undercut banks with tree roots, as well as large boulders. The dominant macrophytes in rivers of this type are mosses and algae growing on stones. Vascular plants occur in greater numbers mainly in backwater zones and pools. The macroinvertebrate community includes numerous larvae of rheophilic and highly oxygen-demanding caddisflies, mayflies, stoneflies and dragonflies, which are indicators of good ecological status. Other important groups include dipteran larvae, crustaceans and unionid mussels, while oligochaetes occur in greater numbers in more eutrophic rivers. In unpolluted rivers of this type, valuable mollusc species may be found, including the

thick-shelled river mussel (*Unio crassus*). Rivers of this type belong to the barbel zone and are inhabited by ecological groups of rheophilic fish, with a predominance of lithophilous and psammophilous species. Characteristic species include barbel (Barbus barbus), grayling (*Thymallus thymallus*), nase (*Chondrostoma nasus*) and stone loach (*Barbatula barbatula*). Associated species include white-finned gudgeon (*Cottus gobio*), brown trout (*Salmo trutta fario*), Eurasian minnow (*Phoxinus phoxinus*), chub (*Leuciscus cephalus*), dace (*Leuciscus leuciscus*), gudgeon (*Gobio gobio*), spirlin (*Alburnoides bipunctatus*) and brook lamprey (*Lampetra planeri*). Potential spawning grounds for Atlantic salmon (*Salmo salar*) and sea trout (*Salmo trutta trutta*) may also occur in rivers of this type. A higher assessment of the ecological status or potential of rivers of this type is determined by a greater proportion of rheophilic and lithophilous species that are sensitive to oxygen shortages and habitat alterations. The ecological continuity of watercourses is also important; in the case of the Nysa Kłodzka River, continuity for Atlantic salmon is required up to the mouth of the Bystrzyca River.

Within the area of direct impact of the planned Project, four RWBs comprising tributaries of the Nysa Kłodzka River are located: Potok Ożarski, PLRW600003123169; Studew, PLRW600003123149; Mąkolnica, PLRW600003123189; and Budzówka, PLRW60000312329. These tributaries belong to type RW_krz—an upland stream or small river on a silicate substrate. They are characterised by a steep gradient and considerable flow velocity, carrying cool and well-oxygenated water. Their bed substrate consists predominantly of stones (macrolithal and mesolithal), with gravel (microlithal and akal) occurring locally. Habitat diversity is determined by the presence of large boulders and coarse woody debris, as well as gravel bars and deeper pools located on bends. The dominant macrophytes in streams of this type are mosses and algae growing on stones; vascular plants occur sporadically. The macroinvertebrate community is dominated by stonefly larvae and by rheophilic and highly oxygen-demanding larvae of caddisflies, mayflies and dragonflies, which are indicators of good ecological status. Streams of this type belong to the trout zone and, in their lower reaches, to the grayling zone. They are inhabited by ecological groups of rheophilic and lithophilous fish. Characteristic species include brown trout (*Salmo trutta fario*), Eurasian minnow (*Phoxinus phoxinus*), brook lamprey (*Lampetra planeri*) and white-finned gudgeon (Cottus gobio). They are often accompanied by stone loach (*Barbatula barbatula*) and dace (*Leuciscus leuciscus*). A higher assessment of the ecological status or potential of watercourses of this type is determined by the presence of fish species sensitive to oxygen deficiencies and habitat alterations. The morphological continuity of watercourses is also important.

Downstream of the Task, on the Nysa Kłodzka River, the Topola dam reservoir is located. The reservoir was created in 2003 as the fourth reservoir in the cascade of the Nysa Kłodzka River. Its maximum inundation area is 3.4 km^2. In combination with a maximum capacity of 21.68 million m^3 and an average flow of the Nysa Kłodzka River of nearly 30 m^3/s, these parameters classify the reservoir as a flow-through (rheolimnic) reservoir.

Reservoirs of this type combine the characteristics of standing-water and river environments, resulting in the co-occurrence of plant communities and invertebrate assemblages characteristic of both lakes and rivers. The fish fauna of rheolimnic reservoirs on upland rivers includes, alongside species typical of standing and slow-flowing waters—such as bream (Abramis brama), white bream (Abramis bjoerkna), roach (Rutilus rutilus), perch (*Perca fluviatilis*), pike (*Esox lucius*) and zander (*Sander lucioperca*)—also riverine species such as chub (*Leuciscus cephalus*), barbel (*Barbus barbus*), nase (*Chondrostoma nasus*), dace (*Leuciscus leuciscus*), gudgeon (*Gobio gobio*), brown trout (*Salmo trutta fario*) and grayling (*Thymallus thymallus*). The section of the Nysa Kłodzka River located immediately upstream of the reservoir and within the reservoir area was designated under the 2nd aRBMP as a heavily modified river RWB: Nysa Kłodzka from the point where the Młynówka Pomianowska branches off to the Kozielno Reservoir, PLRW600003123519

Nysa Kłodzka from Ścinawka to the point where the Młynówka Pomianowska branches off, PLRW60000512333

According to the assessment of status for 2014–2019 included in the 2nd aRBMP (classification of RWBs from 2022)[5], based on the assessment by the Chief Inspectorate for Environmental Protection (GIOŚ) and expert analysis, the following were identified for the RWB under consideration: moderate ecological status, chemical status below good, overall poor water status, and a risk of failing to achieve the environmental objectives. On the other hand, based on the latest available State Environmental Monitoring Programme (PMŚ) data for 2020–2024, at the monitoring station PL02S1401_3956, Nysa Kłodzka—downstream of the Budzówka River outlet, for the RWB Nysa Kłodzka from Ścinawka to the point where the Młynówka Pomianowska branches off, PLRW60000512333, the status of biological elements in 2023 was assessed as moderate. This assessment was based on fish fauna—class III, phytobenthos—class III, and macrophytes—class III, while benthic macroinvertebrates were assessed as class I. In 2023, hydromorphological elements were assessed as class III, with HIR and Wk indicator values of 0.572 and 0.81, respectively. The class of physicochemical elements—groups 3.1–3.5—was assessed as class II. The same class was assigned to group 3.6, "Particularly harmful substances—specific synthetic and non-synthetic pollutants", based on data from 2023–2024. The ecological status was assessed as moderate.

Environmental objectives for the RWB under the 2nd aRBMP

According to the 2nd aRBMP, the environmental objectives for the RWB under consideration are:

- **good ecological status**, including:
    - ensuring the continuity of the watercourse to enable the migration of fish fauna along the significant Nysa Kłodzka watercourse within the RWB, for Atlantic salmon;

    - ensuring the continuity of the watercourse to enable the migration of economically important species along the main Nysa Kłodzka watercourse within the RWB, for sea trout;
- **good chemical status**, except for the less stringent objective specified in column 51 for benzo(a)pyrene in water, for which the required status is below good.

Exemptions under the 2nd aRBMP

During the 2022–2027 planning cycle, the RWB under consideration was designated for an exemption under Article 4(4) of the Water Framework Directive (WFD), i.e. a time extension for achieving the environmental objective, with regard to the following physicochemical and biological indicators:

- phosphate phosphorus;
- benzo(g,h,i)perylene in water;
- brominated diphenyl ethers in biota;
- mercury in biota;
- heptachlor in biota;
- phytobenthos—the diatom index (IO).

An exemption under Article 4(5) of the WFD was also applied, involving a less stringent environmental objective for benzo(a)pyrene in water.

Potok Ożarski, PLRW600003123169

This is a River Water Body (RWB) designated as a heavily modified water body (HMWB), belonging to type RW_krz—an upland stream or small upland river on a silicate substrate. The reasons for designating the RWB as an HMWB include the lack of a feasible possibility of effectively reversing the hydromorphological alterations, the lack of alternatives for the functions performed, an HIR indicator value within the range of 0.40–0.65, and its designation as an HMWB in the previous planning cycle. Other factors include dams, barriers and weirs—transverse structures—as well as physical alterations of the channel and riparian zone, longitudinal structures and flood protection. According to the assessment of status for 2014–2019 included in the 2nd aRBMP (classification of RWBs from 2022), based on the assessment by the Chief Inspectorate for Environmental Protection (GIOŚ) and expert analysis, it was indicated that the status/potential could not be assessed due to the lack of biological monitoring in the RWB. The chemical status was assessed as good; the overall water status was not assessed due to a lack of data. A risk of failing to achieve the environmental objectives was also identified. Based on the latest available State Environmental Monitoring Programme (PMŚ) data for 2020–2024, at the monitoring station PL02S1401_0517, Potok Ożarski—outlet to the Nysa Kłodzka River, downstream of Ożary, the ecological potential of the RWB Potok Ożarski, PLRW600003123169, was assessed as moderate for biological elements in 2023–2024.

This assessment was based on phytobenthos—class III, while fish fauna and benthic macroinvertebrates were assessed as class I. No assessment was available for macrophytes, as this parameter is not subject to classification.

In 2023, hydromorphological elements were assessed as class >2, with HIR and Wk indicator values of 0.437 and 0.55, respectively. The physicochemical elements—groups 3.1–3.5—were assessed in 2023–2024 as class >II due to nitrate nitrogen and total nitrogen. Group 3.6, "Particularly harmful substances—specific synthetic and non-synthetic pollutants", was assessed as class II based on data from 2020. The ecological potential was assessed as moderate. Chemical status was investigated in 2020–2024 and was found to be below good due to exceedances of the limit values for the following substances: brominated diphenyl ethers in biota (2020); benzo(a)pyrene in water (2024);heptachlor in biota (2020). Overall, the water status was assessed as poor.

Environmental objectives for the RWB under the 2nd aRBMP

According to the 2nd aRBMP, the environmental objectives for the RWB under consideration are:

- good ecological potential, including ensuring the continuity of the watercourse to enable the migration of fish fauna, provided that the diadromous indicator D is monitored;
- good chemical status.

Exemptions under the 2nd aRBMP

During the 2022–2027 planning cycle, the RWB under consideration was designated for an exemption under Article 4(4) of the Water Framework Directive (WFD), i.e. a time extension for achieving the environmental objective, with regard to the following physicochemical and biological indicators:

- total nitrogen;
- macrophytes—the Macrophyte River Index (MIR);
- macroinvertebrates—the MMI index;
- fish—the EFI+PL/IBI_PL index.

Studew, PLRW600003123149

This is a River Water Body (RWB) designated as a natural water body belonging to type RW_krz—an upland stream or small upland river on a silicate substrate. In July 2025, the absence of water in the channel was observed in the outlet section of the stream.

Assessment of the status of the RWB according to the 2nd aRBMP and PMŚ

According to the assessment of status for 2014–2019 included in the 2nd aRBMP (classification of RWBs from 2022), based on the assessment by the Chief Inspectorate for Environmental Protection (GIOŚ) and expert analysis, it was indicated that the

status/potential could not be assessed due to the lack of biological monitoring in the RWB. The chemical status was assessed as good; the overall water status was not assessed due to a lack of data. A risk of failing to achieve the environmental objectives was also identified. Based on the latest available State Environmental Monitoring Programme (PMŚ) data for 2020–2024, at the monitoring station PL02S1401_0516, Studew—outlet to the Nysa Kłodzka River, in Suszka, the ecological status of the RWB Studew, PLRW600003123149, was assessed as poor for biological elements in 2023–2024. This assessment was based on macrophytes—class IV, and fish fauna—class IV, while phytobenthos was assessed as class III and benthic macroinvertebrates as class II. In 2023, hydromorphological elements were assessed as class 2, with HIR and Wk indicator values of 0.643 and 0.91, respectively. The physicochemical elements—groups 3.1–3.5—were assessed in 2020–2024 as class >II due to conductivity at 20°C and nitrate nitrogen. Group 3.6, "Particularly harmful substances—specific synthetic and non-synthetic pollutants", was assessed as class II based on data from 2020. The ecological status was assessed as poor.

Chemical status was investigated in 2020–2024 and was found to be below good due to exceedances of the limit values for the following substances:

- brominated diphenyl ethers in biota (2020);
- nickel and its compounds in water (2024);
- benzo(a)pyrene in water (2024);
- heptachlor in biota (2020).

Overall, the water status was assessed as poor.

Environmental objectives for the RWB under the 2nd aRBMP

According to the 2nd aRBMP, the environmental objectives for the RWB under consideration are:

- good ecological status, including ensuring the continuity of the watercourse to enable the migration of fish fauna, provided that the diadromous indicator D is monitored;
- good chemical status.

Exemptions under the 2nd aRBMP

During the 2022–2027 planning cycle, the RWB under consideration was designated for an exemption under Article 4(4) of the Water Framework Directive (WFD), i.e. a time extension for achieving the environmental objective, with regard to the following physicochemical and biological indicators:

- total nitrogen;
- macrophytes—the Macrophyte River Index (MIR);

- macroinvertebrates—the MMI index;
- fish—the EFI+PL/IBI_PL index.

Mąkolnica, PLRW600003123189

This is a River Water Body (RWB) designated as a heavily modified water body (HMWB), belonging to type RW_krz—an upland stream or small upland river on a silicate substrate. The reasons for designating the RWB as an HMWB include the lack of a feasible possibility of effectively reversing the hydromorphological alterations, the lack of alternatives for the functions performed, an HIR indicator value of ≤ 0.40, and its designation as an HMWB in the previous planning cycle. Other factors include dams, barriers and weirs—transverse structures—as well as physical alterations of the channel and riparian zone, longitudinal structures and flood protection.

Assessment of the status of the RWB according to the 2nd aRBMP and PMŚ

According to the assessment of status for 2014–2019 included in the 2nd aRBMP (classification of RWBs from 2022)[8], based on the assessment by the Chief Inspectorate for Environmental Protection (GIOŚ) and expert analysis, it was indicated that the status/potential could not be assessed due to the lack of biological monitoring in the RWB. The chemical status was assessed as good; the overall water status was not assessed due to a lack of data. A risk of failing to achieve the environmental objectives was also identified.

Based on the latest available State Environmental Monitoring Programme (PMŚ) data for 2020–2024, at the monitoring station PL02S1401_0546, Mąkolnica—outlet to the Nysa Kłodzka River, downstream of Sosnowa, the ecological potential of the RWB Mąkolnica, PLRW600003123189, was assessed as moderate for biological elements in 2023–2024. This assessment was based on phytobenthos—class III, while fish fauna and benthic macroinvertebrates were assessed as class I. No assessment was available for macrophytes, as this parameter is not subject to classification.

In 2023, hydromorphological elements were assessed as class >2, with HIR and Wk indicator values of 0.629 and 0.41, respectively. The physicochemical elements—groups 3.1–3.5—were assessed in 2020–2024 as class II. The same class was assigned to group 3.6, “Particularly harmful substances—specific synthetic and non-synthetic pollutants”, based on data from 2020. The ecological potential was assessed as moderate.

Chemical status was investigated in 2020–2024 and was found to be below good due to exceedances of the limit values for the following substances:

- benzo(a)pyrene in water (2024);
- benzo(g,h,i)perylene in water (2024).

Overall, the water status was assessed as poor.

Environmental objectives for the RWB under the 2nd aRBMP

According to the 2nd aRBMP, the environmental objectives for the RWB under consideration are:

- moderate ecological potential—with less stringent indicators and the corresponding class presented in columns 49–50 (total nitrogen); all other indicators: quality class II;
- good chemical status.

Exemptions under the 2nd aRBMP

During the 2022–2027 planning cycle, the RWB under consideration was designated for an exemption under Article 4(4) of the Water Framework Directive (WFD), i.e. a time extension for achieving the environmental objective, with regard to the following biological indicators:

- macrophytes—the Macrophyte River Index (MIR);
- macroinvertebrates—the MMI index;
- fish—the EFI+PL/IBI_PL index.

An exemption under Article 4(5) of the WFD was also applied, involving a less stringent environmental objective for total nitrogen.

Budzówka, PLRW60000312329

This is a River Water Body (RWB) designated as a natural water body belonging to type RW_krz—an upland stream or small upland river on a silicate substrate.

Assessment of the status of the RWB according to the 2nd aRBMP and PMŚ

According to the assessment of status for 2014–2019 included in the 2nd aRBMP (classification of RWBs from 2022)[9], based on the assessment by the Chief Inspectorate for Environmental Protection (GIOŚ) and expert analysis, the ecological status of the RWB under consideration was assessed as moderate. The chemical status was not assessed due to a lack of data. The overall water status was assessed as poor, and a risk of failing to achieve the environmental objectives was identified.

Based on the latest available State Environmental Monitoring Programme (PMŚ) data for 2020–2024, at the monitoring station Budzówka—outlet to the Nysa Kłodzka River, PL02S1401_1241, the ecological status of the RWB Budzówka, PLRW60000312329, was assessed as poor for biological elements in 2023. This assessment was based on fish fauna—class V, while phytobenthos was assessed as class III and benthic macroinvertebrates as class II. In 2023, hydromorphological elements were assessed as class 3, with HIR and Wk indicator values of 0.508 and 0.67, respectively. The physicochemical elements—groups 3.1–3.5—were assessed in 2020–2024 as class >II due to BOD_5, conductivity at 20°C, ammonium nitrogen, nitrate nitrogen, total nitrogen,

phosphate(V) phosphorus and total phosphorus. No monitoring was carried out for group 3.6, “Particularly harmful substances—specific synthetic and non-synthetic pollutants”. The ecological status was assessed as poor. Chemical-status monitoring concerned only benzo(a)pyrene in water; an exceedance of the limit value was recorded in 2024, and on this basis the chemical status was assessed as below good. Overall, the water status was assessed as poor.

Environmental objectives for the RWB under the 2nd aRBMP

According to the 2nd aRBMP, the environmental objectives for the RWB under consideration are:

- good ecological status, including ensuring the continuity of the watercourse to enable the migration of fish fauna, provided that the diadromous indicator D is monitored;
- good chemical status.

Exemptions under the 2nd aRBMP

During the 2022–2027 planning cycle, the RWB under consideration was designated for an exemption under Article 4(4) of the Water Framework Directive (WFD), i.e. a time extension for achieving the environmental objective, with regard to the following physicochemical and biological indicators:

- total nitrogen;
- ammonium nitrogen;
- nitrate nitrogen;
- BOD_5;
- total phosphorus;
- phosphates;
- specific electrical conductivity at 20°C;
- phytobenthos—the Diatom Index (IO).

Nysa Kłodzka from the point where the Młynówka Pomianowska branches off to the Kozielno Reservoir, PLRW600003123519

This is a River Water Body (RWB) designated as a heavily modified water body (HMWB), with a total length of 6.94 km. The reasons for designating the RWB as an HMWB include the lack of a feasible possibility of effectively reversing the hydromorphological alterations, the lack of alternatives for the functions performed, a desk-based HIR indicator value within the range of >0.40–0.65, and its designation as an HMWB in the previous planning cycle. Other factors include physical alterations of the channel and riparian zone, longitudinal structures and flood protection. Under the 2nd aRBMP, the

RWB was assigned to type RW_krz—an upland stream or small upland river on a silicate substrate. This classification appears to be incorrect, as the RWB located immediately upstream—Nysa Kłodzka from the Ścinawka River to the point where the Młynówka Pomianowska branches off, PLRW60000512333—was assigned to type RsW_krz, i.e. a medium-sized river on a silicate substrate. The latter classification corresponds much better to the character of the middle course of the Nysa Kłodzka, which is approximately 30 m wide. The upper section of the RWB under consideration, Nysa Kłodzka from the point where the Młynówka Pomianowska branches off to the Kozielno Reservoir, approximately 1 km long, is located within the backwater zone of the Topola Reservoir. Within the section of the Nysa Kłodzka covered by the RWB under consideration, two reservoir water bodies have been designated: the Topola Reservoir, RW60002112339, and the Kozielno Reservoir, RW600021123519. No GIOŚ monitoring station was designated for this river RWB. Consequently, it is not covered by monitoring under the State Environmental Monitoring Programme (PMŚ). Monitoring stations are, however, located on the aforementioned dam reservoirs.

Assessment of the status of the RWB according to the 2nd aRBMP

According to the assessment of status for 2014–2019 included in the 2nd aRBMP (classification of RWBs from 2022), based on the assessment by the Chief Inspectorate for Environmental Protection (GIOŚ) and expert analysis, the following was indicated for the RWB under consideration:

- moderate ecological status;
- chemical status below good;
- poor overall water status; and
- a risk of failing to achieve the environmental objectives.

There are no up-to-date State Environmental Monitoring Programme (PMŚ) data for 2020–2024, since no GIOŚ monitoring station was designated for the RWB in question.

Environmental objectives for the RWB under the 2nd aRBMP

According to the 2nd aRBMP, the environmental objectives for the RWB under consideration are:

- good ecological potential, including:
    - ensuring the continuity of the watercourse to enable fish migration along the significant watercourse, the Nysa Kłodzka, within the RWB (for salmon);
    - ensuring the continuity of the watercourse to enable the migration of economically important species along the main watercourse, the Nysa Kłodzka, within the RWB (for sea trout);

- chemical status:
    - below good for the less stringent indicator presented in column 51—benzo(a)pyrene in water;
    - good for all other indicators.

Exemptions under the 2nd aRBMP

During the 2022–2027 planning cycle, the RWB under consideration was designated for an exemption under Article 4(4) of the Water Framework Directive (WFD), i.e. a time extension for achieving the environmental objective, with regard to the following physicochemical and biological indicators:

- total organic carbon (TOC);
- fluoranthene in water;
- brominated diphenyl ethers;
- benthic macroinvertebrates—the MMI index.

An exemption under Article 4(5) of the WFD was also applied, involving a less stringent environmental objective for benzo(a)pyrene in water.

Topola Reservoir—reservoir water body, PLRW60002112339

This is a reservoir water body (RWr) designated as a heavily modified water body (HMWB). The reasons for designating the water body as an HMWB include the lack of a feasible possibility of effectively reversing the hydromorphological alterations and the lack of alternatives for the functions performed by the dam reservoir, namely:

- water supply for industrial and other uses;
- public water supply;
- hydropower generation;
- flood protection;
- tourism and recreation; and
- other functions, including flow regulation.

Assessment of the status of the RWB according to the 2nd aRBMP and PMŚ

According to the assessment of status for 2014–2019 included in the 2nd aRBMP (classification of RWBs from 2022)[11], based on the assessment by the Chief Inspectorate for Environmental Protection (GIOŚ) and expert analysis, the following was indicated for the RWB under consideration:

- moderate ecological status;
- good chemical status;

- poor overall water status; and
- a risk of failing to achieve the environmental objectives.

Based on the latest available State Environmental Monitoring Programme (PMŚ) data for 2020–2024, at monitoring station PL02S1401_2017, "Topola Reservoir—Station 1", the ecological potential of the Topola Reservoir RWB, PLRW60002112339, was assessed as moderate for biological elements in 2023–2024. This assessment was based on phytoplankton—class III—and the Flora indicator—class III. Phytobenthos and benthic macroinvertebrates were assessed as class II, while no assessment was available for macrophytes or fish fauna, as these parameters are not subject to classification.

In 2024, hydromorphological elements were assessed as class 2. The physicochemical elements—groups 3.1–3.5—were assessed in 2023–2024 as class >II due to five-day biochemical oxygen demand (BOD_5) and total nitrogen. Group 3.6, "Particularly harmful substances—specific synthetic and non-synthetic pollutants", was assessed as class II based on data from 2023–2024.

The ecological potential was assessed as moderate. Chemical status was monitored in 2023–2024 and was found to be below good due to exceedances of the limit values for the following substances:

- brominated diphenyl ethers in biota (2023);
- fluoranthene in water (2024);
- mercury and its compounds in biota (2023); and
- benzo(a)pyrene in water (2024).

Overall, the water status was assessed as poor.

Environmental objectives for the RWB under the 2nd aRBMP

According to the 2nd aRBMP, the environmental objectives for the RWB under consideration are:

- moderate ecological potential—with less stringent indicators and the corresponding class presented in columns 49–50 (phytoplankton); all other indicators: quality class II. The objectives also include:
    - ensuring continuity for fish migration; and
    - ensuring the continuity of the watercourse to enable the migration of economically important aquatic animals, namely sea trout;
- chemical status:
    - below good for the less stringent indicator presented in column 51—benzo(a)pyrene in water;
    - good for all other indicators.

Exemptions under the 2nd aRBMP

During the 2022–2027 planning cycle, the RWB under consideration was designated for an exemption under Article 4(4) of the Water Framework Directive (WFD), i.e. a time extension for achieving the environmental objective, with regard to the following chemical-status indicators:

- fluoranthene in water;
- brominated diphenyl ethers in biota.

An exemption under Article 4(5) of the WFD was also applied, involving a less stringent environmental objective for:

- phytoplankton;
- benzo(a)pyrene in water.

In terms of groundwater, the Task area is located within the boundaries of the UGB with code GW6000109, situated in the Central Odra River Basin District, within the Odra River Basin. The UGB covers an area of 4,262.51 km^2. According to the current groundwater status assessment, the chemical and quantitative status of this body of water has been rated as good, and the applicable planning documents do not indicate any risk of failing to achieve environmental objectives.

Within the Task area, there are groundwater intakes, described in Chapter 4.1.4, used to supply the population with water for municipal purposes, including drinking water, operating as part of the Sudeten Water Supply System. These intakes are located in the Nysa Kłodzka valley in the Kamieniec Ząbkowicki area and constitute part of the local water supply system. In connection with the implementation of the project, some of the intakes that conflict with the planned land development are scheduled to be relocated or restored as part of the Task.

The Task area is located outside the boundaries of the Main Groundwater Basin (MGB). The nearest MGB is reservoir No. 340, located approximately 11 km from the Task site.

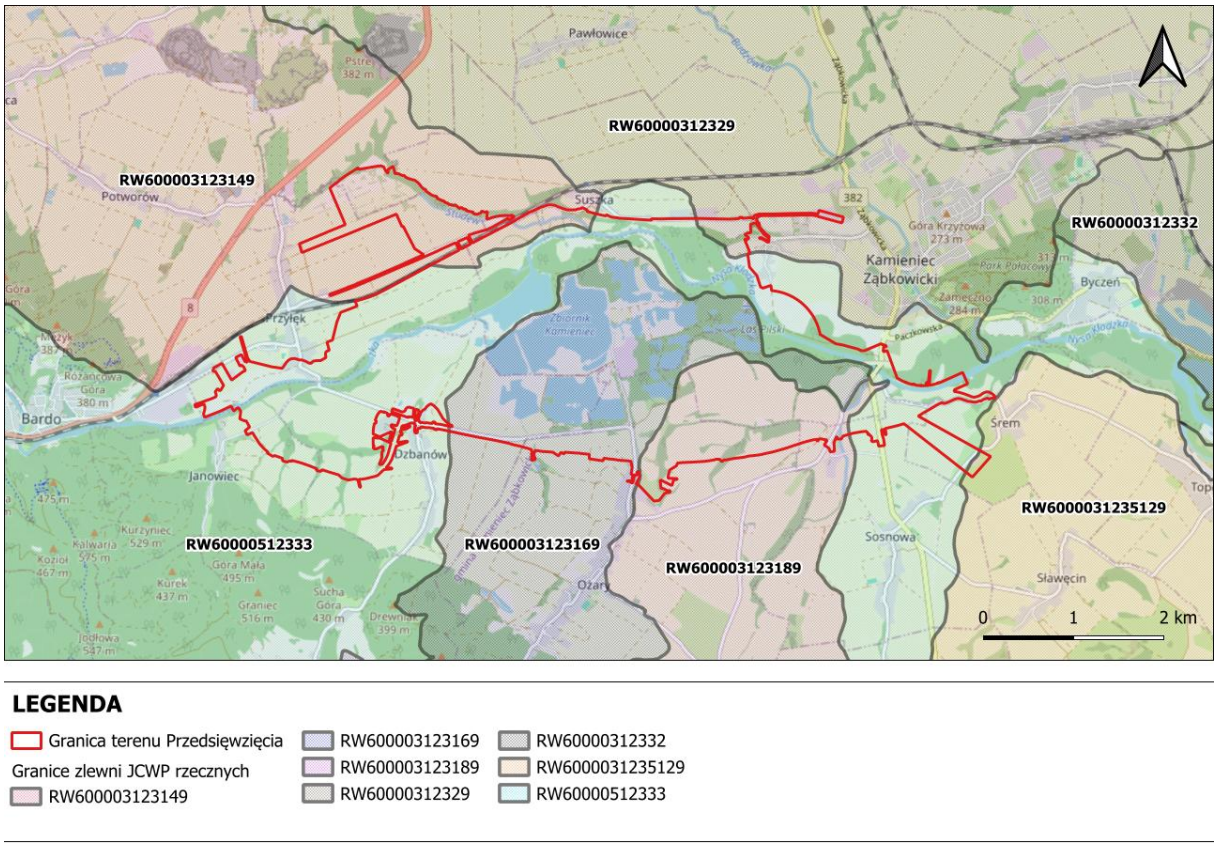


Figure 3: Catchment boundaries of river water bodies (RWBs). Source: Author's own work

All river water bodies within the Task's area of impact – the Nysa Kłodzka (PLRW60000512333), its tributaries Studew, Potok Ożarski, Mąkolnica and Budzówka, and downstream the Nysa Kłodzka to the Kozielno Reservoir and the Topola Reservoir – are in poor overall status and at risk of failing to achieve their environmental objectives, mainly due to biological elements, nutrients and chemical status below good. The environmental objectives for the Nysa Kłodzka include ensuring river continuity for the migration of Atlantic salmon and sea trout, and the hydromorphology of some tributaries is already altered. These baseline conditions inform the assessment in three ways: (i) the receiving waters are sensitive and the key criterion is that the Task must not cause deterioration of status or prevent the achievement of the objectives; (ii) river continuity and sediment transport are the most significant issues, which is why the fish pass and sediment management are key mitigation measures; (iii) existing nutrient loads increase the risk of water-quality deterioration in the new reservoir, which requires monitoring. Accordingly, impacts on surface waters are rated as high in Table 11, and the cumulative effects with the existing reservoir cascade are assessed in Chapter 6. Groundwater body GW6000109 is in good chemical and quantitative status; the main issue is the protection and relocation of the existing groundwater intakes.

4.2.1.6 Air Quality

There is no air quality monitoring station in the immediate vicinity of the project, so atmospheric background characteristics were determined based on data from the nearest monitoring points, including the station located in Ząbkowice Śląskie.

Local air quality is primarily influenced by emissions from municipal and residential from individual heating systems, road transport, and, to a lesser extent, emissions associated with agricultural activities and small-scale commercial operations. During the heating season, there may be periodic increases in particulate matter concentrations, typical of small towns with predominantly single-family housing.

A significant factor influencing ventilation conditions is the layout of the Nysa Kłodzka Valley, which functions as a local air flow corridor. The open nature of the valley and the significant proportion of agricultural land favor the dispersion of pollutants and air exchange, although short-term episodes of air quality deterioration may occur during periods of calm weather.

During the implementation phase of the Task, potential impacts on air quality will be short-term and local in nature and will be primarily associated with dust emissions from earthworks, material transport, and the operation of construction equipment. These emissions will be mitigated by standard mitigation measures employed at construction sites.

4.2.1.7 Acoustic Environment

The acoustic background of the analyzed area is primarily shaped by land use patterns, with a predominance of agricultural land, meadows, and areas covered with vegetation. Buildings are scattered, and the proportion of areas requiring noise protection is relatively small.

The main sources of noise are transportation routes, including roads and the railway line. However, due to their alignment and the significant proportion of open areas, the impact of noise is local in nature and spatially limited.

As a result, the acoustic environment of the area can be considered typical of areas with a low degree of urbanization, where noise levels are primarily shaped by local traffic and seasonal agricultural activities.

The sources of noise nuisance during the project's implementation phase will be the operation of construction machinery and the movement of vehicles serving the construction site. The increase in noise emissions will be short-lived, and the nuisance will subside upon completion of the works.

4.2.2 Biological Environment

The description of the biological environment is based on the results of a comprehensive nature inventory carried out over a full annual cycle in 2025–2026. The inventory covered the Task area and its surroundings and included all key groups of organisms. Legally protected areas were additionally analysed within a 5 km buffer, on the basis of the Central Register of Nature Conservation Forms, the GDOŚ geoservice and Natura 2000 Standard Data Forms.

The Task area comprises a section of the Nysa Kłodzka valley at the foot of the Bardzkie Mountains. It is a mosaic of riparian forests along the river, oak-hornbeam forests on the valley slopes, meadows and agricultural land. Long-term aggregate extraction has substantially transformed the valley floor, but the resulting water bodies now provide secondary habitats for waterbirds and amphibians. Despite clear signs of human pressure, including the presence of invasive alien species, the biodiversity of the area is assessed as high.

In accordance with ESS6, the inventory results were used to prepare a Critical Habitat Assessment (CHA, Annex 13.5) and a Biodiversity Management Plan (BMP, Annex 13.6). The CHA concluded that no critical habitat occurs within the Task area. Annex I habitat patches and the river section are classified as natural habitat, and the remaining areas as modified habitat. The BMP sets out the mitigation measures, the monitoring programme and the allocation of responsibilities for their implementation.

4.2.2.1 Vegetation cover / flora and Natural Habitats

The characteristics of the vegetation cover were developed on the basis of field surveys, the nature inventory carried out, and an analysis of the available spatial data and natural-environmental materials. The area analysed comprises a mosaic of habitats typical of river valleys, including water bodies and oxbow lakes, meadow areas, fragments of forest communities, as well as areas used for agriculture, such as arable fields and wasteland. Part of the analysed area lies within mining areas, where extractive activities have transformed the terrain and led to the formation of anthropogenic landforms. Vegetation forming secondary natural habitats has developed on artificially shaped elevations and slopes, as well as around water bodies created as a result of raw-material extraction. Habitat conditions are shaped primarily by high groundwater levels, periodic fluctuations in water levels and the presence of numerous depressions in the terrain, some of which were created as a result of mining activities. Clusters of alien invasive species are also present in the area and are gradually expanding their range, particularly along the river channel. Their spread leads to the deterioration of habitat structure and the displacement of native plant species.

The area analysed was found to contain natural habitats of Community interest within the meaning of the Habitats Directive: 91E0*—riparian willow, poplar, alder and ash forests,

and 9170—Galio-Carpinetum, or Central European subcontinental oak-hornbeam forests. Within the area of the planned investment and its impact range, individual small patches of the following habitats were also inventoried: 6410—Molinia meadows on calcareous, peaty or clayey-silt-laden soils; 8220—siliceous rocky slopes with chasmophytic vegetation; and 9180*—Tilio-Acerion forests of slopes, screes and ravines. Several patches of habitat 6510—lowland and mountain hay meadows were also identified. The largest of these contained sites of protected plant species and populations of protected invertebrates.

The inventoried patches of habitat 91E0* were assessed as being in an unfavourable-bad conservation condition. The main cause of this condition is the continuing spread of invasive alien species, which dominate the ground layer during the growing season, leading to distortion of the structure and species composition of the plant communities. The riparian forest patches retain the characteristics typical of the habitat primarily in spring, before the ground layer becomes dominated by invasive species. The condition of habitat 9170 was assessed as stable: its patches are well developed and retain the appropriate structure and characteristic species composition. The conservation condition of the individual small patches of habitats 6410, 8220, 6510 and 9180* was assessed as varied, ranging from favourable to unfavourable-inadequate. These habitats will not be disturbed as a result of the planned investment works. It is also anticipated that the operation of the reservoir will not have a significant impact on them, and that any potential impacts will be associated primarily with the construction phase and indirect effects, such as a temporary increase in dust generation. During the surveys, protected vascular plant species were recorded, the most numerous of which included wild garlic (Allium ursinum), snowdrop (Galanthus nivalis) and autumn crocus (Colchicum autumnale). The first two species are associated primarily with fertile and moist forest habitats, whereas autumn crocus occurs mainly in wet meadows and other grassland habitats. The remaining records of plant species consisted of isolated observations of species subject to partial protection. Thirteen protected moss species were also identified, including, among others, *Anomodon attenuatus*, *Frullania dilatata*, *Homalia trichomanoides* and *Thuidium tamariscinum*.

4.2.2.2 Wildlife / Fauna

The characteristics of the fauna were developed on the basis of field surveys, the nature inventory carried out, and an analysis of the available spatial data and natural-environmental materials. The diverse environmental structure, comprising water bodies and oxbow lakes, riparian woodlands, fragments of deciduous forests, meadows, and agricultural lands, supports the presence of numerous animal species characteristic of aquatic, forest, and open habitats. It should be emphasized that part of the project area remains within the sphere of influence of mining activities - a mine operates there, and parts of the landscape have been artificially shaped as a result of long-term human activity. Consequently, landforms such as hills, embankments, and anthropogenic water

bodies have emerged there, which have, over time, been colonized by living organisms and now serve as natural habitats.

As a result of the inventory carried out, 147 bird species were recorded in the area analysed. The ornithofauna was characterised by considerable ecological diversity and included species associated, among others, with aquatic and wetland environments, open areas, wooded areas and forest habitats. Of the species recorded, 34 were identified in the table as species listed in Annex I to the Birds Directive and requiring special conservation measures, including the protection of their habitats. These included, among others, Haliaeetus albicilla, Ciconia ciconia, Ciconia nigra, Pandion haliaetus, Grus grus, Alcedo atthis, Lanius collurio, Curruca nisoria, Pernis apivorus, Circus aeruginosus, Circus pygargus, as well as several species of terns (Sternidae) and woodpeckers (Picidae). The inventory results indicate that the investment area and its surroundings provide habitats for both common species associated with agricultural and forest landscapes and species of high conservation importance.The presence of numerous water bodies and periodically waterlogged depressions in the terrain favours the occurrence of amphibians. During the surveys, a total of nine amphibian species protected under Polish law were recorded. Numerous species of frogs and toads—including *Bufotes viridis, Bufo bufo, Pelophylax ridibundus, Pelophylax esculentus, Hyla arborea, Pelophylax lessonae and Rana temporaria*—have colonised artificial post-extraction water bodies, which serve as breeding and habitat sites for these species. In addition, a site occupied by the great crested newt (*Triturus cristatus*) was identified in small water bodies located outside the area where the Task is to be implemented. These water bodies are outside the range of the planned works; therefore, the site occupied by this species will not be disturbed.Six reptile species were also recorded in the area analysed, including five protected species: *Coronella austriaca, Lacerta agilis, Zootoca vivipara, Natrix natrix* and *Anguis fragilis*. The presence of an invasive alien species—the pond slider (Trachemys scripta)—was also recorded. Reptile sites are distributed relatively evenly throughout the investment area, although most observations were concentrated near artificial water bodies, ditches and the channel of the Nysa Kłodzka River.

A diverse assemblage of mammals was also recorded within the boundaries of the Task area. Among the larger and medium-sized native species, including game species commonly occurring in Poland, the following were observed: *Capreolus capreolus, Cervus elaphus, Sus scrofa, Dama dama, Vulpes vulpes, Martes* sp., *Meles meles* and *Lepus europaeus*. The presence of invasive alien species was also recorded: *Procyon lotor, Nyctereutes procyonoides, Neogale vison* and *Myocastor coypus*. During the surveys, protected mammal species were also recorded, including *Castor fiber, Lutra lutra, Talpa europaea, Mustela nivalis, Mustela putorius, Sciurus vulgaris* and *Canis lupus*. Mammal observations were concentrated mainly in areas covered by dense vegetation, which provides shelter for animals, as well as in forests and near water bodies. Mammal

activity along the river channel was noticeably lower. Bats were also recorded in the area analysed. Representatives of the genera *Pipistrellus, Myotis and Nyctalus* were identified, as well as *Vespertilio murinus* and *Barbastella barbastellus*. Bats use the area analysed primarily as a foraging ground, particularly in the vicinity of water bodies and watercourses, along forest edges, adjoining wooded areas and in open areas. These features provide suitable feeding conditions, while linear vegetation structures may serve as flight routes. The mammal assemblage is complemented by small mammal species, whose presence was recorded considerably less frequently than that of larger representatives of this group. These included representatives of the genera *Sorex, Myodes, Microtus* and *Crocidura*, as well as the water-associated *Neomys fodiens*. The lower number of observations of small mammals may result both from their secretive lifestyle and from their limited detectability during standard field surveys.The animal assemblages are complemented by numerous invertebrate species associated with the diversity of habitats occurring in the area analysed. Among the protected invertebrates, bumblebees were the most numerous, with a total of seven species recorded, followed by beetles, represented by four species. Among the protected beetles, *Osmoderma eremita* was recorded, a species associated with mature trees and the presence of tree hollows containing decaying wood. The other protected beetle species were observed only sporadically. *Mantis religiosa* was also recorded in the area analysed, along with valuable butterfly species, namely *Lycaena dispar* and *Phengaris nausithous*. Their occurrence is favoured by open grasslands, meadows and wetland habitats. A single site of *Anodonta cygnea* was recorded in one of the post-extraction water bodies. Two protected snail species were also recorded: *Helix pomatia* and *Vertigo moulinsiana*. It is important to note that the populations of Lycaena dispar, Phengaris nausithous and Vertigo moulinsiana occur outside the area where the works will be carried out, and no disturbance to their habitat is anticipated.

4.2.2.3 Protected Areas and Forms of Nature Conservation

The analysis covered Natura 2000 sites and nature reserves within approximately 10 km of the Task area, and other forms of nature conservation within a 5 km buffer. Natura 2000 sites located further away but hydrologically connected with the Task area through the Nysa Kłodzka river were also considered. The forms of nature conservation identified are presented in the table below, and their location in relation to the Task is shown in Figure 4. The Task area lies outside the boundaries of area-based forms of nature conservation. Five natural monuments, all English oaks (*Quercus robur*), are located within its boundaries, in the reservoir zone.

The Natura 2000 site closest to the Task is the Special Area of Conservation Góry Bardzkie PLH020062, located approximately 150 m from the reservoir inlet. Its subjects of protection are mainly forest habitats and the greater mouse-eared bat *Myotis myotis*. The patches closest to the Task are slope forests (9180*), located on the slopes above the

planned reservoir. Two further sites are connected with the Task area through the Nysa Kłodzka valley:

- the Special Area of Conservation Przełom Nysy Kłodzkiej koło Morzyszowa PLH020043, approximately 3.2 km upstream, which protects, among others, the river habitat 3260, the otter and four bat species,
- the Special Protection Area Zbiornik Otmuchowski PLB160003, approximately 12.5 km downstream, beyond the Topola and Kozielno reservoirs.

The other Natura 2000 sites within the analysis area have no connection with the Task area. Of the national forms of nature conservation, the closest to the Task is the Góry Bardzkie i Sowie Protected Landscape Area, approximately 0.5 km from the reservoir inlet. The remaining forms of nature conservation lie approximately 2 to 8 km from the Task area. They are the „Obryw skalny" nature and landscape complex, the nature reserves Cisy, Cisowa Góra and Skałki Stoleckie, and the Śnieżnicki Landscape Park with its buffer zone.

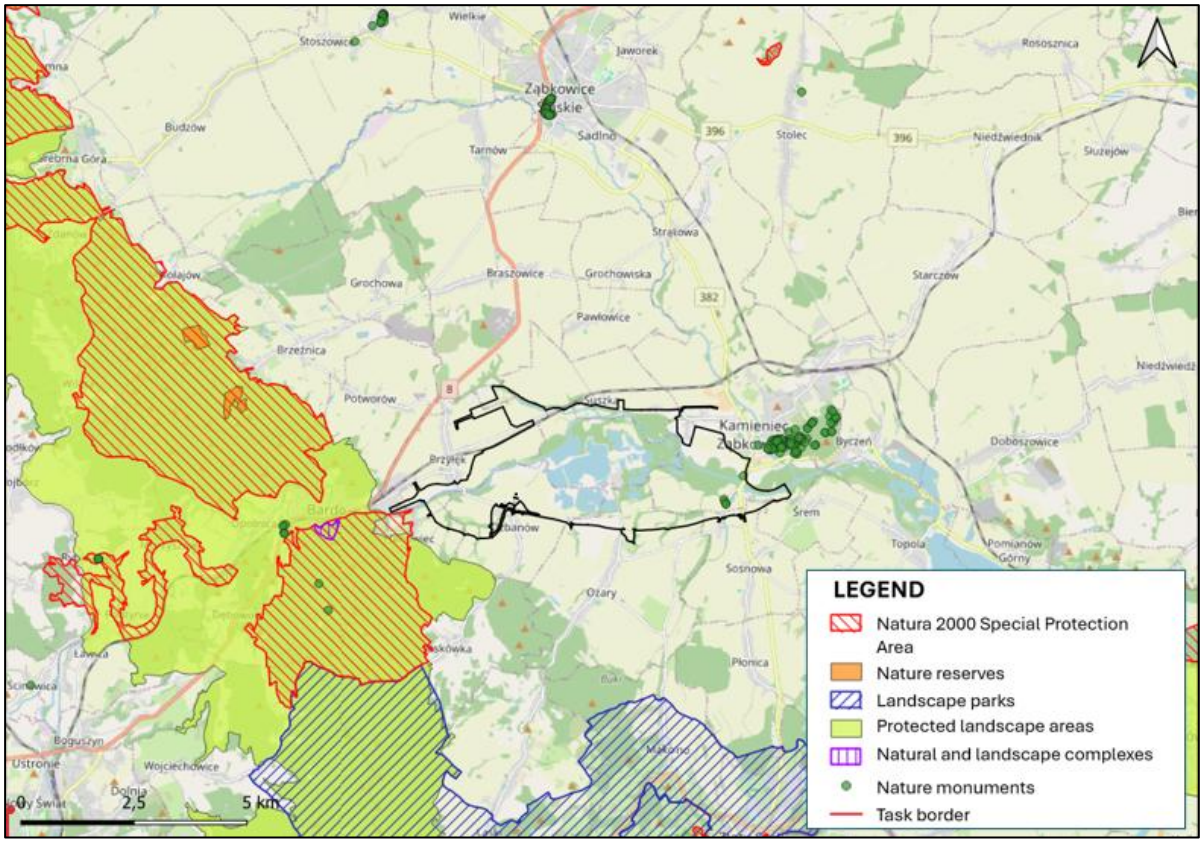


Figure 3: Location of the Task in relation to nature conservation areas
Source: Author's own work

Table 8 Forms of nature conservation within the analysis area and their relationship to the Task

Form of nature conservation	Main subjects of protection	Distance	Relationship to the Task
SAC Góry Bardzkie PLH020062	9 habitat types (incl. 9170, 9180*); greater mouse-eared bat *Myotis myotis*	approx. 150 m	Immediate vicinity, no overlap
SAC Przełom Nysy Kłodzkiej koło Morzyszowa PLH020043	12 habitat types (incl. 3260, 91E0*); 4 bat species; otter *Lutra lutra*; dusky large blue *Phengaris nausithous*	approx. 3.2 km (upstream)	Functional connection via the Nysa Kłodzka river corridor
SPA Zbiornik Otmuchowski PLB160003	Waterbirds	approx. 12.5 km (downstream)	Hydrological connection via the reservoir cascade
SACs: Góry Złote PLH020096, Kopalnie w Złotym Stoku PLH020007, Skałki Stoleckie PLH020012, Łęgi koło Chałupek PLH020104	Forest and non-forest habitats, bats, invertebrates, 91E0*	approx. 6.6–8.7 km	No connection
Góry Bardzkie i Sowie Protected Landscape Area	Forest and non-forest ecosystems, ecological corridors	approx. 0.5 km	Vicinity, no overlap
Nature reserves Cisy, Cisowa Góra, Skałki Stoleckie	Yew (*Taxus baccata*) stands; former quarry with bat habitats	approx. 3.4 / 5 / 7.6 km	No connection
„Obryw skalny" Nature and Landscape Complex	Rock landslide	approx. 2.1 km	No connection
Śnieżnicki Landscape Park with buffer zone	Mountain flora, karst phenomena, landscape	approx. 5 km	No connection
Natural monuments – 5 English oaks (*Quercus robur*)	Individual trees	Within the Task area	Located in the reservoir zone

4.2.2.4 Ecological corridors (wildlife corridors)

The Task Area is located within the Nysa Kłodzka Valley ecological corridor (KPd-18A), which forms part of the national network of wildlife corridors developed by the Institute of Nature Conservation of the Polish Academy of Sciences. This ecological corridor ensures ecological connectivity between the Sudetes and the Sudeten Foothills and the Silesian Lowlands, enabling animal migration and plant dispersal.

The corridor's structure is primarily associated with the Nysa Kłodzka River valley and riparian habitats, such as riparian forests, oxbow lakes, wetlands, meadows, and a mosaic of agricultural lands. Part of the Task area is also located in areas transformed by

mining activities, where anthropogenic landforms and water bodies have been created, which due to vegetation succession, form local natural habitats.

The location of the Task within the national network of ecological corridors is shown in Figure 5.

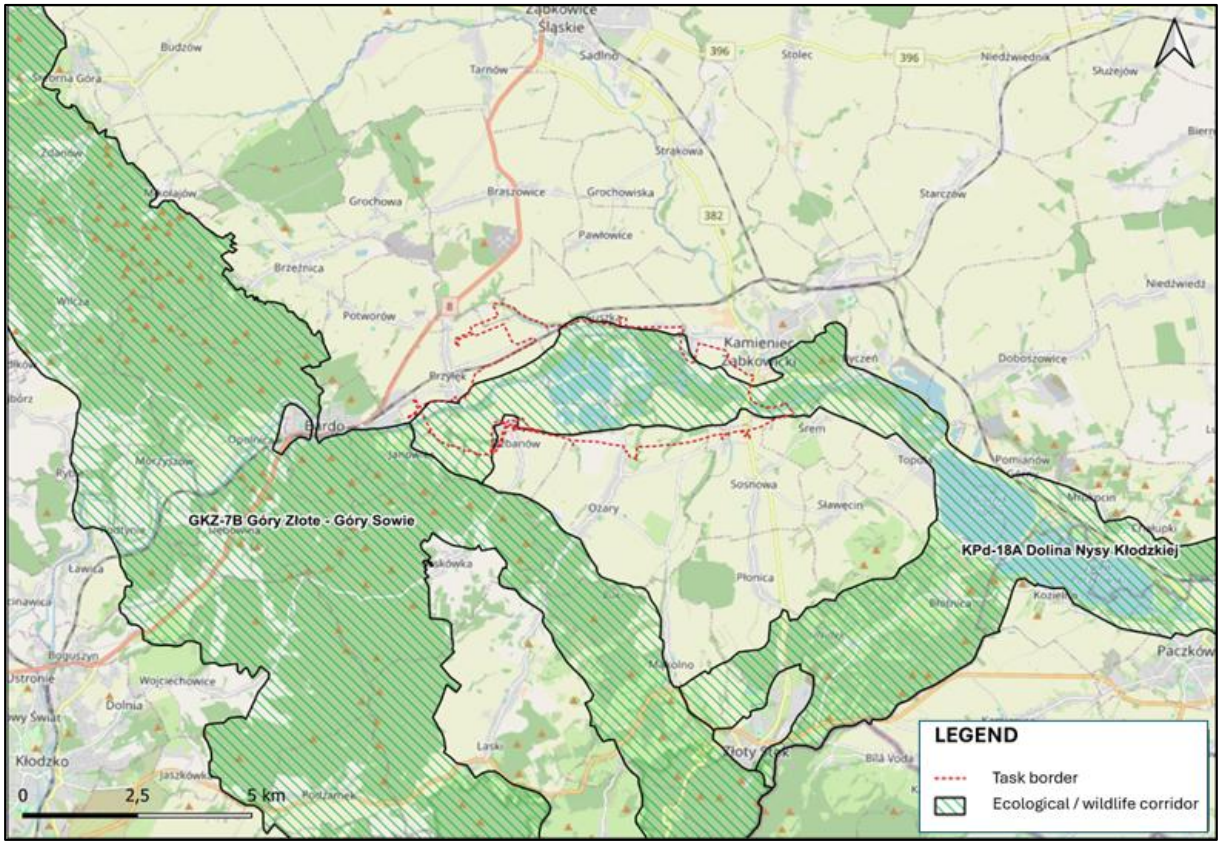


Figure 4: Location of the Task in relation to ecological corridors / wildlife corridors
Source: Institute of Nature Conservation, Polish Academy of Sciences, database of ecological corridors / wildlife corridors (mapa.korytarze.pl)

4.2.2.5 Landscape

The Task area is characterized by the mosaic landscape of the Nysa Kłodzka River valley, where natural and anthropogenically transformed elements coexist. A key element of the landscape structure is the river valley with floodplains, oxbow lakes, and water reservoirs, which determine the spatial layout of the analyzed area. The landscape is dominated by water management areas and a rural landscape characterized by a mosaic of agricultural land, meadows, and pastures. Locally, there are also small patches of forest and fragments of urban landscape.

A significant element is also the areas transformed by mining activities, including quarries and artificial water reservoirs, which today constitute an important component of the landscape structure.

Within the boundaries of the analyzed area, a priority forest landscape with enhanced natural and landscape values has also been identified. This unit occurs in a small section

along the eastern border of the Task. In the Polish spatial planning system, such landscape units are classified for analytical purposes used in landscape assessment and do not constitute a formal form of nature conservation (such as a national park, landscape park, or Natura 2000 site). Therefore, they do not impose separate legal restrictions on the implementation of the Task; however, their landscape values are considered in environmental analyses.

4.2.2.6 Ecosystem services

Based on the environmental characteristics presented in the previous subsections, it can be concluded that the Task area performs functions typical of river valleys with a diverse habitat structure. These primarily include agricultural areas, water bodies and oxbow lakes, patches of woodlands, and habitats created as a result of mining activities related to natural gravel extraction.

Consequently, the Task Area has the potential to provide ecosystem services in all basic categories. Provisioning services are primarily associated with agricultural land use, the availability of water resources, and the operation of a drinking water intake within the analyzed area. Provisioning services also include the exploitation of mineral resources, including natural aggregates.

Regulating services, understood as benefits derived from natural processes that moderate environmental phenomena, stem mainly from the functioning of the Nysa Kłodzka Valley and include, among others, water retention, regulation of surface runoff, and filtration and infiltration processes within alluvial deposits, which are important for groundwater recharge.

Cultural services are associated with the landscape values of the river valley and the potential for recreational use of the area. In contrast, supporting services encompass ecological processes occurring within the river valley and the maintenance of ecological continuity within the ecological corridor / wildlife corridor of the Nysa Kłodzka Valley.

At the current stage of the Task's preparation, the identification of ecosystem services is preliminary and based on available data regarding the state of the environment. A natural inventory of the Task area is currently underway, the results of which will allow for a more accurate identification of natural habitats and the functioning of ecological processes. These will serve to prepare the detailed documents necessary for the implementation of the Task.

Table 9 Ecosystem services identified within the Task area

Category of ecosystem services	***Ecosystem services***	***Characteristics within the Task Area***	***Connection to an environmental component***
Provisioning services	Food and biomass production	Agricultural lands (arable land, meadows, and pastures) form the basis of local agricultural production and biomass generation.	Soil, land use
	Water resources – drinking water	Within the analyzed area, there is a drinking water intake facility utilizing groundwater resources associated with the river valley system.	Groundwater
	Surface water resources	The Nysa Kłodzka River, oxbow lakes, and water reservoirs constitute the local surface water resources.	Surface water
	Mineral resources	The analyzed area contains documented deposits of natural aggregates, and aggregate extraction serve as examples of provisioning services related geological resources.	Geology
	Biological resources of water	Surface waters provide a habitat for fish and other aquatic organisms.	Surface waters, biodiversity
Regulating services	Water retention and flow regulation	The Nysa Kłodzka Valley, oxbow lakes, and depressions increase natural water retention and slow down runoff in the catchment area / watershed / river basin.	Hydrology
	Water quality regulation	River valley vegetation and alluvial deposits limit the transport of nutrients and suspended solids from agricultural areas.	Surface water, soil
	Groundwater recharge	Infiltration processes in the river valley support groundwater recharge.	Groundwater
Cultural services	Landscape values	The diverse landscape of the river valley and the presence of water bodies create scenic and aesthetic values.	Landscape
	Recreation and tourism	The river valley and water bodies offer recreational potential (e.g., hiking, cycling, fishing).	Landscape, surface waters
Supporting services	Biodiversity conservation	The area is located within the Nysa Kłodzka Valley ecological corridor / wildlife corridor (KPd-18A), which supports species migration and habitat continuity.	Biodiversity
	Ecological processes	Habitat diversity (meadows, oxbow lakes, water bodies, woodlands) promotes the cycle of matter and the functioning of ecosystems.	Soil, biodiversity
	Habitat succession	Excavation pits / quarries created as a result of aggregate extraction have been partially colonized by vegetation and fauna, forming secondary wildlife habitats.	Biodiversity, landscape

4.2.3 Cultural heritage

Elements of cultural heritage, including immovable monuments, archaeological sites, and fragments of the historical spatial layout of settlements, have been identified within the Task Area. Information on their locations was determined based on available archival materials and information provided by the relevant monument protection authorities. The identification of cultural heritage resources was conducted in accordance with the requirements of national regulations regarding monument protection and in accordance with the World Bank Standard (ESS8).

4.2.3.1 Immovable Monuments

No extensive historic ensembles or significant complexes of historic architecture were identified within the project area. Cultural heritage is represented by individual elements of a local nature, typical of the historic settlement structure of Lower Silesian villages. In the village of Pilce, in the Nysa Kłodzka Valley, partially demolished and degraded relics of a former church and village cemetery, as well as remnants of historic farm buildings, have been preserved. These structures are severely degraded and fragmentary in nature.

Within the scope of the Task, structures subject to formal conservation protection have been identified. The provincial register of monuments includes a three-span road bridge over the Nysa Kłodzka River in Przyłęk, dating from 1902, and a manor house located in Dzbanów, near the road under reconstruction and the Laskówka stream. Meanwhile, two railway viaducts have been included in the municipal register of monuments.

4.2.3.2 Archaeological sites

Archaeological sites related to the historical use of the Nysa Kłodzka Valley have been identified within the Task Area. Information on their locations comes from national registers and cultural heritage records maintained by the relevant monument protection authorities. Most of these sites are surface sites identified during archaeological surveys conducted at the regional level. Their identification is based primarily on archaeological materials found on the ground surface, such as pottery fragments or other small artifacts. Such sites are relatively common in agricultural areas and river valleys, where long-term land use facilitates the exposure of archaeological material.

Archaeological sites located within the Task Area are protected under national regulations regarding the protection of cultural heritage. Documentation of these sites is maintained by the relevant heritage conservation authorities and serves as the basis for further conservation measures in the event of investment planning in the area.

4.2.3.3 Cultural Landscape

The cultural landscape within the Task Area is typical of the rural areas of the Nysa Kłodzka Valley and is the result of historical agricultural use and the development of settlements along the river valley. Its structure is currently dominated by agricultural land, patterns of cultivated fields, and local roads, while historical landscape elements have been preserved only to a limited extent.

According to information provided by the regional monument protection authority, the boundary of the approximate scope of the investment includes fragments of the historical rural layouts of several localities: the southern part of the village of Przyłęk, the western fragment of the rural layout of the village of Istebka, and the western fragment of the spatial layout of the town of Kamieniec Ząbkowicki. The boundary of the analyzed area also runs along the southern border of the historical rural layout of the village of Suszka. On the scale of the entire Task area, these elements occur only fragmentarily and constitute part of the general settlement patterns of the region.

Movable elements of cultural heritage have also been identified within the scope of the Task. Within the boundaries of the Task, there is a penitential cross in the village of Dzbanów, while directly along the project boundary there are: a wayside shrine on Kłodzka Street in Kamieniec Ząbkowicki and a penitential cross in the village of Suszka. These structures will be handled in accordance with conservation requirements and in consultation with the relevant historic preservation authorities - in the event of a collision with the execution of works, they are expected to be moved to new, safe locations.

The cultural heritage within the Task Area is scattered and fragmented. The identified elements will be subject to appropriate conservation measures to ensure that the task complies with national heritage protection laws and World Bank standards for cultural heritage protection.

5 Assessment of Environmental and Social Risks and Impacts

5.1 Environmental Impact Assessment

5.1.1 Methodology for the Environmental Impact Assessment

A generalized impact assessment was conducted for the construction and operation phases of the Task, accounting for the main environmental components. The assessment considered the nature and extent of anticipated changes as well as the environment's susceptibility to transformation. The natural environment section addressed both vegetation cover and fauna, with particular emphasis on ecological connections and ecological continuity of aquatic organism migration.

5.1.2 Description of Key Environmental Impacts

The most significant negative environmental impacts identified in the preliminary analysis stage are associated with the construction of hydrotechnical structures, including the dam and side embankments, as well as with land transformation within the reservoir basin. The construction of these elements involves the transformation of the land surface over a significant area, including the removal of vegetation, earthworks, and a permanent change in the topography of the terrain. Within the reservoir basin, areas currently used as farmland and meadows, as well as forested areas, are expected to be flooded, leading to the permanent and irreversible loss of the habitats developed there and the transformation of the land surface.

Significant impacts also concern the aquatic environment. The construction and operation of the reservoir will alter the hydrological regime of the Nysa Kłodzka River and its tributaries, as well as disrupt the continuity of the river's morphological processes, including sediment transport and the shaping of the riverbed and banks. The project may also affect local hydrogeological conditions, including groundwater levels, particularly in connection with earthworks and the extraction of local materials for the construction of hydrotechnical structures. Within the reservoir basin, there are groundwater intakes used to supply water to the population, which, in the event of a conflict with the project, are planned to be restored while maintaining the continuity of their operation.

The Task's location in the river valley significantly impacts ecological / wildlife corridors and species migration - both within the river channel (fish fauna) and across the entire river valley. It should also be noted that the section of the Nysa Kłodzka valley downstream of the planned reservoir has already been altered by existing retention reservoirs (Topola, Kozielno, Otmuchów, Nysa), creating a cascade system on the river. This means that the Task will be implemented in an altered environment; however, it may lead to a further reduction in the river's ecological continuity and an intensification of the cumulative impacts within this system. Additionally, the implementation of the Task may affect the morphological continuity of the watercourse, including sediment transport and the shaping of the riverbed and banks.

In this context, the Task includes the construction of a fish pass designed to mitigate the project's impact on ichthyofauna migration and improve migration conditions within the analyzed river section. This solution aims to partially minimize the barrier effect of the project within the existing hydrotechnical modifications, although its effectiveness will be subject to further verification and refinement as design work progresses.

The impacts also include legally protected areas located in the vicinity of the Task, including the potential impact on their conservation objectives. Additionally, due to the confirmed presence of archaeological sites and cultural heritage objects, the implementation of the project may lead to their alteration or loss

because of earthworks and flooding of the area. In connection with the road network reconstruction planned as part of the Task, the historic road bridge over the Nysa Kłodzka River in Przyłęk, listed in the register of monuments, will be demolished. The demolition of the bridge will be preceded by obtaining the required administrative decisions and necessary approvals. The work will be carried out in accordance with the recommendations of the competent monument protection authority and under the supervision of a conservator. If necessary, compensatory measures specified by the Conservator of Monuments will be implemented.

During the construction phase, there will be short-term impacts, including dust emissions and noise associated with construction work and the transport of materials and excavated material. These impacts are reversible, short-lived, and will subside upon completion of construction work, primarily earthworks.

The implementation of the project will also lead to a permanent change in the landscape of the river valley. The Task will impact the ecosystem services of the river valley, causing a change in their scope and functioning, particularly with regard to regulating, habitat, and retention functions.

At this stage, the following impacts have been identified as the most significant:

- the permanent loss of certain terrestrial habitats of fauna and flora, the restoration of which will be the subject of compensatory measures,landscape transformation,
- changes in water conditions within the river valley, including the creation of an area of standing water within the foothill river valley,
- impact on ecological corridors and fish fauna migration,
- impact on areas protected under the Act of April 16, 2004, on Nature Conservation.

Compensatory measures addressing the permanent loss of terrestrial habitats, fauna and flora, ecological corridors, and ichthyofauna migration are set out in detail in the Biodiversity Management Plan (Appendix 13.6), which applies the full mitigation hierarchy in accordance with ESS6 and covers all species and habitat types identified during the nature inventory.

5.1.3 Assessment of the significance of environmental impacts

An assessment of the significance of environmental impacts was conducted for the identified environmental components, taking into account the construction and operation phases of the project. The assessment considers the nature and scale of the impacts as well as the significance of the environment, understood as its susceptibility to change and its natural value. In cases of uncertainty, the precautionary principle was applied.

The results of the assessment are presented in tabular form below. For their correct interpretation, please refer to the adopted assessment criteria, the explanations of which are provided below.

Explanations for Table 11:

Phase:

- Implementation – construction phase
- Operation – reservoir operation

Impact scale:

- Low – local, short-term, and reversible impact
- Medium – impact affecting the status of local animal and plant populations, natural habitat resources, covering a larger area or a longer period
- High – long-term, extensive, or irreversible impact

Environmental sensitivity:

- Low – an environment of low natural value or low susceptibility to change
- Medium – an environment with moderate susceptibility to natural or human-induced changes
- High – an environment of high natural value, sensitive, or performing essential ecological functions

Impact assessment:

- Low – minor impact on the environment
- Medium – noticeable impact, requiring mitigation measures
- High – significant long-term or irreversible impact, requiring the design and implementation of mitigation and compensatory measures

Need for mitigation measures:

- Yes – mitigation measures and/or compensatory measures required
- no – standard measures are sufficient

Table 10 Assessment of the significance of environmental impacts on environmental components

Environmental component	*Impact*	*Phase*	*Scale of impact*	*Environmental sensitivity*	*Impact assessment*	*Mitigation measures and/or compensatory measures*
Land area	Flooding and permanent land transformation	Operation	High	Medium	High	Yes
Vegetation cover / flora	Removal of vegetation and loss of natural habitats / wildlife habitats	Implementation / Operation	High	High	High	Yes
Wildlife / Fauna	Habitat loss and disturbance of animals	Construction / Operation	High	High	High	Yes
Wildlife / Fauna	Creation of aquatic and wetland habitats in the reservoir basin	Operation	Medium	Medium	Average	Yes
Surface water	Change in the hydrological regime	Exploitation	High	Medium	High	Yes
Surface waters	Disruption of sediment transport and the continuity of river morphological processes	Exploitation	High	Medium	High	Yes
Groundwater	Changes in hydrogeological conditions and relocation of groundwater intakes	Implementation / Operation	Medium	Average	Average	Yes
Groundwater	Local changes in hydrogeological conditions resulting from earthworks and the extraction of native material for the construction of hydrotechnical structures	Implementation	Medium	Average	Average	Yes
Air	Particulate emissions	Implementation	Low	Medium	Low / Medium	Yes
Acoustic environment	Noise associated with construction work and the transport of materials and excavated material	Implementation	High	Medium	High	Yes

Environmental component	*Impact*	*Phase*	*Scale of impact*	*Environmental sensitivity*	*Impact assessment*	*Mitigation measures and/or compensatory measures*
Landscape	Permanent landscape change	Exploitation	High	Medium	High	Yes
Natura 2000 sites	Potential impact on the conservation objectives and the integrity of Natura 2000 sites[1] in the vicinity of Task	Construction / Operation	Low	Low	Low	No
Protected landscape areas	Potential impact on the conservation objectives and integrity of Protected Landscape Areas in the vicinity of the Task ""[2]	Construction/Operation	Low	Low	Low	No
Animal movement in the Nysa Kłodzka Valley (ecological corridor /)	Restriction of the ecological corridor's continuity and hindrance to wildlife migration within the river valley	Implementation / Operation	Medium	High	High	Yes
Fish migration in the river (ichthyofauna)	Fish migration – impact mitigated by a fish pass	Exploitation	Medium	High	Medium / High	Yes
Ecosystem services	Changes in regulatory, habitat, and retention functions	Implementation/Operation	High	Medium	High	Yes
Cultural Heritage	Flooding and land transformation affecting archaeological sites and cultural heritage sites	Implementation/ Operation	High	High	High	Yes

5.1.4 Assessment of Impacts on Nature Conservation Forms, Including Natura 2000 Sites

The analysis covered Natura 2000 sites located within approximately 10 km of the Task, as well as more distant sites hydrologically connected with it through the Nysa Kłodzka river (Section 4.2.2.3, Table 9). A detailed assessment was carried out for the sites located within the 5 km buffer and for the hydrologically connected site: SAC Góry Bardzkie PLH020062, SAC Przełom Nysy Kłodzkiej koło Morzyszowa PLH020043 and SPA Zbiornik Otmuchowski PLB160003. The other sites listed in Table 9 have no connection with the Task. The Task is located outside the boundaries of all these sites and does not require any land take within them.

Góry Bardzkie PLH020062 (approx. 150 m from the reservoir inlet). Habitats 6510, 8220, 9170 and 9180*, as well as a foraging habitat of the greater mouse-eared bat *Myotis myotis*, were confirmed within the inventory buffer. No habitat patch lies within the land-take area or the area at risk of damage (0.00 ha). Only indirect impacts are possible. During construction, these include pollution, dust, noise, lighting and the spread of invasive alien species towards the patches located near the site boundary. During operation, they include changes in water conditions in the riparian zone and a change in the character of the bat's foraging areas outside the site. The forest habitats on the slopes are topographically isolated from the reservoir, and the breeding roosts and hibernacula of the greater mouse-eared bat will not be affected.

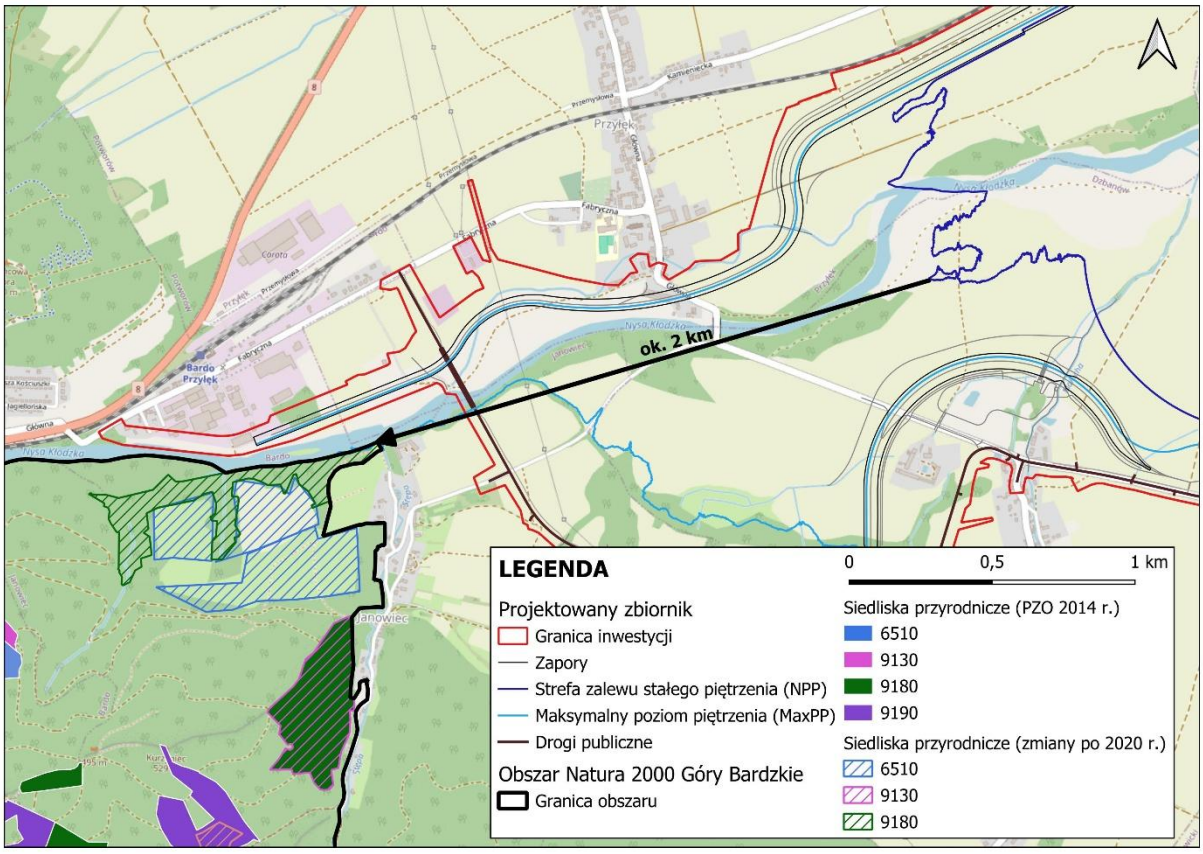
Przełom Nysy Kłodzkiej koło Morzyszowa PLH020043 (approx. 3.2 km upstream). Impacts carried by the river current will not reach the site. The impact concerns the otter *Lutra lutra* and is indirect: the main dam will weaken the population's links with the valley below Bardo and will become an additional barrier to the migration of fish, which form the otter's food base. Fish migration into the site is already restricted by the weirs in Janowiec and Opolnica (Chapter 6). The otter's food base within the site therefore depends both on the effectiveness of the fish pass at the dam and on the passability of these structures. Provided that an effective fish pass, strips of riparian vegetation and passages along the banks under bridges are ensured, the impact is assessed as not significant. This assessment is conditional on hydraulic modelling confirming that the backwater zone (also at the extraordinary pool level of 258.00 m a.s.l.) does not extend into the site.

Zbiornik Otmuchowski PLB160003 (approx. 12.5 km downstream, beyond the Topola and Kozielno reservoirs). Direct impacts are excluded. An indirect impact may result from filling the new reservoir and integrating it into the operation of the reservoir cascade. This could change water levels in the Otmuchów Reservoir, which are important for goose roosts (a minimum water surface of 450 ha) and for wader foraging areas on the exposed bottom (August–October). Provided that the filling schedule is agreed with the cascade operator and the seasonal water-level regime is maintained in the water management instruction, the impact is assessed as not significant. During operation, the new reservoir may have a positive effect as an additional resting site for waterbirds.

The Task will interrupt the continuity of the Nysa Kłodzka, which connects the sites analysed. With the fish pass in place, riparian vegetation and tree lines retained, and the conditions for cascade operation met, ecological connections within the valley will be maintained and the coherence of the Natura 2000 network will not be affected.

Table 12 Assessment of impacts on Natura 2000 sites

Natura 2000 site	Impact	Phase	Impact assessment
Góry Bardzkie PLH020062	Indirect impact on habitats near the site boundary and on greater mouse-eared bat foraging areas	Implementation / Operation	Low – no significant impact
Przełom Nysy Kłodzkiej koło Morzyszowa PLH020043	Barrier effect for the otter; restriction of fish migration	Implementation / Operation	Low – no significant impact
Zbiornik Otmuchowski PLB160003	Changes in water levels resulting from reservoir filling and cascade operation	Operation (including filling)	Low – no significant impact



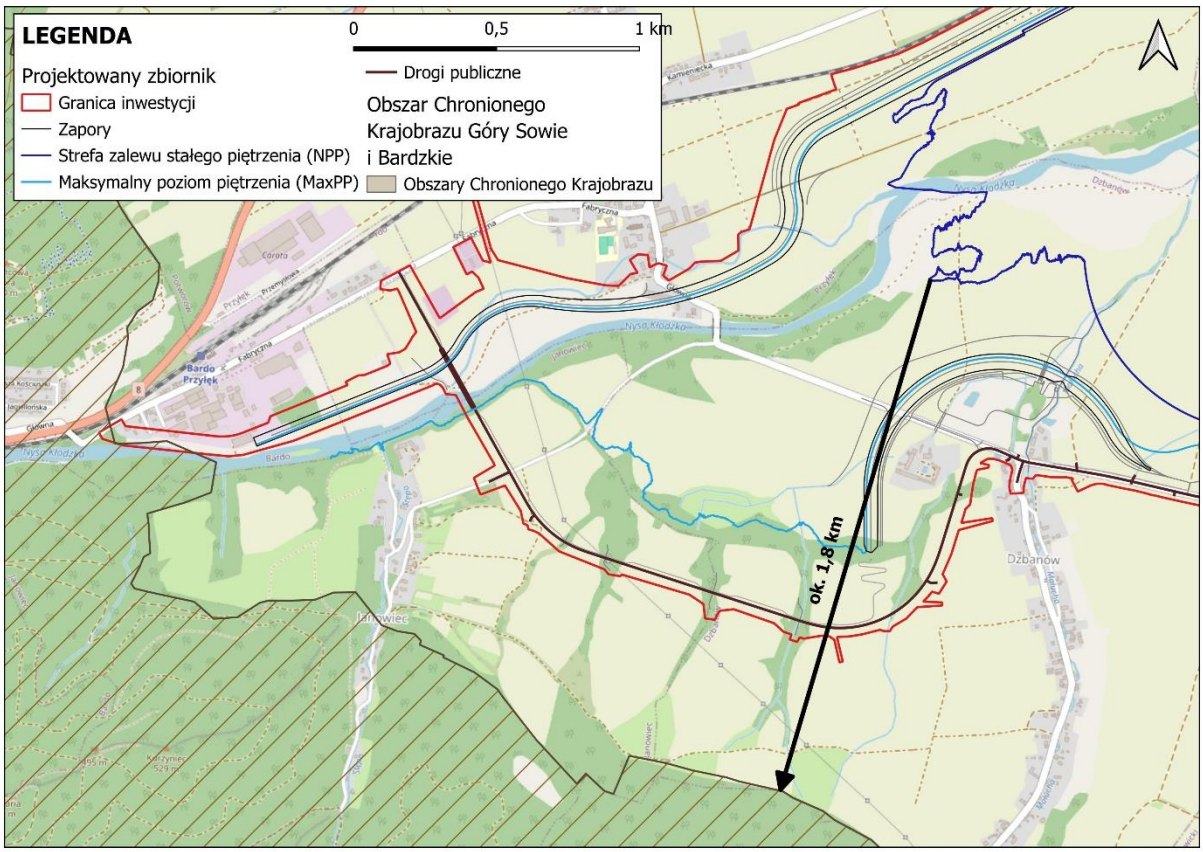
Projektowany zbiornik – Planned reservoir
Granica inwestycji – investment Task border
Zapory – dams
Strefa zalewu stałego piętrzenia (NPP) – area of permanent impounding (NPL)
Maksymalny poziom piętrzenia (MaxPP)- Maximum pool level (MaxPL)
Drogi publiczne – public roads
Siedliska przyrodnicze (PZO 2014 r.) – natural habitats (Plan of Conservation Measures of 2014)
Siedliska przyrodnicze (zmiany po 2020 r.) – natural habitats (modifications after 2020)

Figure 5: A section of the planned reservoir in relation to natural habitats / wildlife habitats located within the "Góry Bardzkie" Natura 2000 site. The arrow indicates the distance from the normal impoundment level / water level of the reservoir (source: author's own work).

Góry Bardzkie i Sowie Protected Landscape Area (approx. 0.5 km from the Task area). This distance refers to the furthest-reaching part of the Task, i.e. the point where the river flows into the reservoir; the main part of the infrastructure, including the reservoir basin and its future water surface, is located approx. 1.8 km from the boundary of the area (Figure 7). The Task is located entirely outside the Protected Landscape Area, and works in the inlet area will be limited in extent and short-term. The reservoir will change the landscape of the valley floor at the foot of the Bardzkie Mountains; however, these changes will take place outside the protected area, and the river section upstream of the reservoir inlet will retain its natural character. The key elements of the biotic and abiotic environment of the area will not change, and the planned flood protection infrastructure and water management fall within the exemptions from the prohibitions applicable in the Protected Landscape Area. The impact on the natural and landscape values and on the conservation objectives of the area is assessed as not significant.

Natural monuments. The five natural monuments, all English oaks (Quercus robur), located within the reservoir zone will be removed, resulting in the permanent loss of these forms of nature conservation. This requires a derogation granted by the competent authority, and as the impact cannot be mitigated, compensatory measures will be implemented.

The remaining forms of nature conservation, i.e. the „Obryw skalny" nature and landscape complex, the nature reserves Cisy, Cisowa Góra and Skałki Stoleckie, and the Śnieżnicki Landscape Park with its buffer zone, lie approximately 2 to 8 km from the Task area and have no connection with it.



Projektowany zbiornik – Planned reservoir
Granica inwestycji – investment Task borderZapory – dams
Strefa zalewu stałego piętrzenia (NPP) – area of permanent impounding (NPL)
Maksymalny poziom piętrzenia (MaxPP)- Maximum pool level (MaxPL)
Drogi publiczne – public roads
Obszar Chronionego Krajobrazu Góry Sowie i Bardzkie – Protected Landscope Area Góry Sowie i Bardzkie

Figure 6: A section of the planned reservoir in relation to the Bardzkie and Sowie Mountains protected area. The arrow indicates the distance from the normal impoundment level / water level of the reservoir (source: author's own work).

5.2 Assessment of risks and social impacts

5.2.1 Identified social risks and impacts

The tables below present the results of the assessment of social impacts and risks associated with the implementation of the Task. Each identified impact has been characterized according to three criteria: nature, type, and significance.

The nature of the impact determines its general axiological character. Negative impacts are those that worsen the social, economic, or living conditions of people affected by the Task. Positive impacts mean an improvement in this situation - both for those directly affected and for the wider community. Neutral impacts do not cause significant changes in any direction. For impacts that do not pertain to the specific nature of this Task, the classification "not applicable" is used.

The type of impact describes the mechanism by which it arises. Direct impacts are an immediate and certain consequence of the Task's implementation, resulting directly from its physical scope - an example is land acquisition for the reservoir basin. Indirect impacts result from secondary effects of the Task, arising through social, economic, or environmental processes - an example is the polarization of the community caused by disparities in the situations of property owners. Cumulative impacts arise from the overlap of the effects of this Task with other investments carried out in parallel or within the same impact area - in this project, this primarily concerns the cumulative effect with the construction of the S8 expressway.

The significance of an impact is a synthetic assessment of its social importance considering the spatial extent, scale, duration, and likelihood of occurrence of a given impact. A four-point assessment scale was adopted:

- High - an impact with a wide scope or one that deeply interferes with the situation of affected individuals, permanent or difficult to reverse, with a high probability of occurrence; requires the implementation of comprehensive mitigation or compensatory measures.
- Medium - an impact of moderate scope or intensity, partially reversible or limited to a specific group of people; requires the implementation of mitigation measures, but its effects can be effectively limited.
- Low - an impact of limited scope and severity, usually reversible; its effects can be effectively mitigated through standard mitigation measures.
- Negligible - an impact of marginal scope or negligible severity, causing no significant changes in the situation of those affected; does not require dedicated mitigation measures but is subject to monitoring.

Impacts assessed as negligible or low have been included in the tables in accordance with the World Bank's methodological requirements, which mandate a comprehensive review of potential risks regardless of their anticipated magnitude. A properly designed system of compensation and mitigation measures should allow for the reduction of most negative impacts to a negligible level.

Table 11 Social Risks and Impacts Tasks

No.	*Impact/Risk*	*Type*	*Type*	*Significance*
1.	BENEFICIARY AREA FOR DIRECT AND INDIRECT BENEFICIARIES			
1.1	Improvement of flood safety / flood security	Positive	Direct	High
1.2	Long-term development of tourism and recreation	Positive	Direct	Medium
2.	LAND USE AND OWNERSHIP STRUCTURE			
2.1	Land acquisition of residential homes	Negative	Direct	High
2.2	Land acquisition of agricultural land	Negative	Direct	High
2.3	Land acquisition of developed real estate without physical relocation / physical displacement	Negative	Direct	Medium
2.4	Land acquisition of non-agricultural land	Negative	Direct	Medium
2.5	Expiration of leases	Negative	Direct	High
2.6	Accumulation of land acquisitions for the Reservoir and S8	Negative	Cumulative	High
2.7	Permanent restrictions on property use	Negative	Direct	Moderate
2.8	Temporary occupation of the property during construction	Negative	Direct	Medium
2.9	Creation of new recreational areas	Positive	Direct	Medium
2.10	Restricted community access to natural resources	Not applicable	Not applicable	None
2.11	Loss of rights of informal users	Not applicable	Not applicable	None
2.12	Expiration of the lease	Not applicable	Not applicable	None
2.13	Expiration of mortgages	Negative	Direct	Negligible
2.14	Loss of access to recreational and fishing ponds	Negative	Direct	Negligible
2.15	Impact on the host community of physically resettled PAPs	Not applicable	Not applicable	None
3.	TECHNICAL INFRASTRUCTURE AND PUBLIC SERVICES			
3.1	Decommissioning of the infiltration water intake	Negative	Direct	High
3.2	Impact on individual water intakes	Negative	Indirect	Low
3.3	Introduction of TO in connection with the relocation of network infrastructure	Negative	Direct	Low

No.	*Impact/Risk*	*Type*	*Type*	*Significance*
3.4	Introduction of TO in connection with the construction of new network infrastructure	Negative	Direct	Low
3.5	Deterioration of local and county road surfaces	Negative	Indirect	Low
3.6	Increased safety for vulnerable road users (construction of bike lanes)	Positive	Indirect	Medium
3.7	Indirect impact on historical monuments within the Reservoir's area of influence	Positive	Direct	Moderate
3.8	Cumulative impact of construction-related nuisances from the Reservoir and S8	Negative	Cumulative	Average
3.9	Construction nuisances and risk of traffic accidents	Negative	Indirect	Low
3.10	Overburdening of local educational infrastructure	Not applicable	Not applicable	None
3.11	Overburdening of local healthcare infrastructure	Not applicable	Not applicable	None
4.	SOURCES OF INCOME AND THE LOCAL ECONOMY			
4.1	Loss of ASIF insurance status	Negative	Direct	Low
4.2	Loss of eligibility for UE subsidies	Negative	Direct	Low
4.3	Deterioration of mental health	Negative	Direct	Low
4.4	Impact on the local labor market	Not applicable	Not applicable	None
4.5	Increase in living costs following physical relocation	Negative	Direct	Negligible
4.6	Loss of value of adjacent properties	Not applicable	Not applicable	None
4.7	Impact on local supply chains, local inflation	Not applicable	Not applicable	None
4.8	Rent increases and housing shortage	Not applicable	Not applicable	None
4.9	Increased mobility and logistics costs (commuting to fields, road reconstruction)	Negative	Direct	Low
4.10	Influx of workers and associated risks	Not applicable	Not applicable	None
5.	DEMOGRAPHY AND SOCIAL STRUCTURE			
5.1	Reducing depopulation through the development of tourism	Positive	Indirect	Low
5.2	Tourism gentrification	Negative	Moderate	Low
5.3	Accelerated depopulation due to physical relocation and economical displacement	Not applicable	Not applicable	None
5.4	Disruption of informal social support networks	Negative	Direct	None

No.	Impact/Risk	Type	Type	Significance
5.5	Threat to intangible cultural practices	Not applicable	Not applicable	None
5.6	Incidents of gender-based violence (GBV)	Not applicable	Not applicable	None
5.7	Women's economic security	Not applicable	Not applicable	None
5.8	Risk of inappropriate behavior by the contractor's employees toward the local community	Not applicable	Not applicable	None
5.9	Impact on national and ethnic minorities	Not applicable	Not applicable	None
6.	VULNERABLE GROUPS AND PARTICIPATION			
6.1	Social conflict	Negative	Indirect	High
6.2	Exclusion from the consultation process due to various barriers	Negative	Indirect	Medium
6.3	Risk of token acceptance (passive participation in consultation)	Negative	Moderate	Medium
6.4	Non-use of GRM due to lack of trust in the impartiality and effectiveness of procedures	Negative	Indirect	High
6.5	Risk of consultation fatigue	Negative	Moderate	Medium
6.6	Insufficient access to information about the project	Negative	Moderate	Average
6.7	Insufficient access by PAP to information on compensation entitlements	Negative	Indirect	Average
6.8	Risk of misinformation	Negative	Moderate	Medium

The Kamieniec Ząbkowicki Reservoir, as part of the Nysa Kłodzka River cascade (together the Topola, Kozielno, Otmuchów, and Nysa facilities), will increase retention in the upper part of the catchment area and enable the control of flood waves. The main positive impact is the improvement of flood safety directly for approximately 80,000 people. In the broader context of flood safety in the Odra River basin, the Kamieniec Ząbkowicki Reservoir, as part of the Nysa Kłodzka cascade, indirectly contributes to reducing flood risk for a significantly larger number of residents - including areas located in the middle and lower reaches of the Odra, which are particularly vulnerable to cumulative flood waves from multiple tributaries. This results in reduced material losses, economic stabilization, lower insurance costs, and improved mental well-being for residents of areas previously at risk of flooding.

This assessment is confirmed by the results of a survey conducted among PAP members and residents of the impact zone during the second week of March 2026. The survey included 99 respondents, of whom 68% reside in the municipality of Kamieniec

Ząbkowicki, 14% in the municipality of Bardo, and 12% in other neighboring municipalities. Demographically, the group of people aged 46–65 dominated (43%), followed by the 26–45 age group (34%), seniors over 65 (17%), and people aged 18–25 (4%). Women accounted for 53% of respondents. Most of those surveyed live in close proximity to the Task site—53% reside in the same town, 37% use roads and infrastructure within the impact zone, and 9% can see the Task site directly from their window or yard. Among the respondents, 30% had experienced flooding in the past: 18% multiple times, 12% once. This makes the surveyed population particularly sensitive to the issue of flood safety.

As many as 74% of respondents assessed that the task would definitely or somewhat increase their sense of safety, while only 15% believed it would not change their level of safety. This result confirms that the local community views flood protection as a priority benefit of the Task.

The investment will also facilitate the development of tourism and recreation, complementing the offerings of Bardo and Kamieniec Ząbkowicki. This may generate new jobs in the service sector; however, the significance of this impact was assessed as moderate, due to uncertainty regarding the final scale and pace of these effects. It is worth noting that in the survey, none of the respondents assessed local earning opportunities as an area that the investment would worsen (0 responses). As many as 65% anticipate an improvement, while 33% do not expect any change.

All categories of land acquisition were classified as impacts of high significance, due to their irreversible nature and the fact that the loss of legal title to property is the most direct form of interference in property. Land acquisition of residential homes affects a limited number of two households and entails the need for physical relocation, which will require the provision of appropriate support. In the case of land acquisition of agricultural land constituting a significant part of the production base, the acquisition of the property may require affected families to adjust their economic model or change their income structure. It may result in economic displacement, which will require the provision of appropriate support. The significance of lease agreement expirations was also assessed as high, as tenants lose access to their means of livelihood without automatic entitlement to property-based compensation, which requires the application of appropriate support procedures in accordance with the ESS5 standard. A special case is PAP, whose properties are located within the scope of both the Reservoir construction and the S8 expressway. The cumulative impacts resulting from land acquisition for the purposes of both investments may lead to a reduction in the farm's area, which in some cases will affect its current profitability. Concerns related to the loss of agricultural or leased land were cited as the main reason for worries about earning potential by 7% of survey respondents. This result is low, but it is concentrated exclusively among PAPs directly affected by land acquisition.

The impact of the Investment on farmers' social security was assessed as low. A reduction in farm size may result in the termination of insurance under ASIF. Depending on their length of service, owners may switch to early agricultural retirement or to the ZUS system. This ensures continuity of health and pension coverage, though it entails higher premiums and different rules for calculating benefits. The significance of the loss of EU subsidies was also assessed as low. Since these payments compensate for the costs of maintaining the land, their loss following land acquisition is operationally neutral for the farm's budget.

From a social perspective, there is stress associated with the loss of one's place of residence. This impact was deemed low due to the small scale of the relocations and the fact that they occur within the same locality.

In terms of technical infrastructure, the need to decommission the water intake in Kamieniec Ząbkowicki was deemed a significant impact. This requires the construction of a new replacement water intake before construction of the Kamieniec Ząbkowicki Reservoir begins. However, the Task's impact on individual wells, so-called household wells, was assessed as low; changes in the groundwater level will be monitored during the construction and filling of the reservoir.

The impacts associated with the reconstruction of transmission and distribution networks (electricity, gas), the deterioration of local roads, and construction-related nuisances have been classified as low. Standard measures, such as traffic management plans, will effectively minimize the impact of transportation and construction work. However, survey results indicate that roads and traffic volume are the only area where negative forecasts predominate. Here, 41% of respondents expect deterioration, 31% do not foresee any changes, and only 26% view this aspect positively. This result contrasts with the generally favorable assessment of the investment and serves as a basis for considering construction traffic management a priority, both in terms of public transportation and the implementation of optimal logistics solutions that minimize the expected negative impact throughout the entire task implementation period.

It should be emphasized that negative public perception may be mitigated by the final outcome of the work: the planned realignment of road infrastructure involves the construction of new road sections. These will replace the current infrastructure, which has been degraded by mining traffic, leading in the long term to a significant improvement in technical parameters and driving comfort.

On the other hand, the improvement in safety for pedestrians and cyclists thanks to new paths (medium significance) and the indirect protection of historical monuments below the dam through the elimination of flood risk were assessed positively.

The cumulative impacts resulting from the simultaneous construction of the Reservoir and the S8 highway, which may periodically increase noise and dust levels, identified as of medium significance. In a survey on construction nuisances (noise, dust, heavy

transport), 22% of respondents cited these as a source of concern - the highest result among all categories of concerns, although the absolute number of responses (22 people) remains relatively low compared to the 70% of respondents who declared no concerns whatsoever.

Several economic risks will not materialize due to the specific nature of the Task. The investment will not affect employment levels or wage levels, as it does not interfere with the operations of local businesses, including MRM Byczeń (interviews indicate that there will be no impacts in this regard). No impact was also found regarding local supply chains, service prices, and the stability of the residential rental market. The scale of the influx of contractor personnel is not sufficient to affect residents' living costs or the capacity of health and educational infrastructure.

The increase in living costs following resettlement accessing agricultural land were assessed as negligible. The higher energy efficiency of the new residential buildings will offset potential differences in operating costs, and the planned reconstruction of the road network will ensure transportation connectivity. In turn, changes to access logistics for agricultural land were assessed as minor, given the potential need to implement mitigation measures.

The implementation of the investment may provide a boost to the local market for tourism and recreational services. The construction of the reservoir and accompanying infrastructure creates opportunities for residents to diversify their income, which in the long term may increase the region's residential appeal. In the survey, 79% of respondents anticipated improved access to recreational areas (river, fishing grounds) (the highest result among all assessed impact categories), indicating that the reservoir's recreational potential is perceived by the local community as a tangible and anticipated benefit. The facility's impact on demographic processes is limited and depends on the future activities of local government and the private sector during the operational phase. Therefore, the significance of this impact was assessed as low.

The potential increase in the area's attractiveness is associated with the risk of gentrification and rising living costs, which could negatively affect lower-income groups. This risk was deemed low due to the long-term nature of any potential changes and the limited territorial scope. Current real estate resources in neighboring municipalities are sufficient to prevent sharp price fluctuations. The scale of the planned infrastructure does not indicate a mass takeover of housing stock by external entities. Only 5 respondents in the survey cited a change in the character of the town as a source of concern, confirming the low level of gentrification fears among the surveyed population.

Physical relocation and changes in land use will not affect informal neighbourhood support networks.. The relocation of people affected by the investment takes place within the boundaries of the same settlement unit. Residents retain access to existing social infrastructure and neighborhood support networks.

The following impacts were deemed non-existent:

- *cultural practices*: no sites of traditional or ritual significance within the reservoir basin; the project does not affect the region's intangible cultural heritage;
- *safety (GBV/SEA)*: no isolated temporary housing facilities for the Contractor and the project's integration within a stable legal system eliminate typical risks to the local community;
- *women's economic security*: The Task does not conflict with sectors employing women, and the compensation system guarantees equal access to funds regardless of gender;
- *national and ethnic minorities*: no groups with the status of national, ethnic, or indigenous minorities;
- *depopulation trends*: due to the minimal scale of physical relocations, the Task will not significantly affect the municipality's net migration.

The most serious social risk, classified as high, is the conflict arising from the subjective sense of threat felt by residents living near the dams. Concerns regarding the stability of the structures and a potential decline in property market value have led to demands for the State Treasury to purchase the properties and a sense of injustice toward those being expropriated. Mitigating these effects and concerns requires systematic dialogue with the PAP, the provision of accessible technical materials, and the creation of a space for the out-of-court expression of concerns.

At the same time, tensions arise in connection with the acquisition of agricultural land. For local producers, the loss of farmland constitutes a barrier to implementing development strategies, such as farm succession or income diversification (e.g., agritourism). This process is interpreted as an intrusion into the existing way of life and the foundation of economic security, which is associated with a subjective sense of losing one's life plans.

A separate category of risks are barriers to access to information and participation in the public consultation process. These risks do not stem from the direct physical impacts of the Investment, but rather from the structural characteristics of the local community, i.e., a high proportion of seniors, low levels of digital activity, and limited experience in collaborating with the administration regarding infrastructure investments of this scale. The demographic profile of the survey sample confirms this assessment: people aged 46 and older accounted for a total of 64% of respondents, and seniors (over 65 years of age) for 17%. The survey results also indicate that face-to-face meetings and an information desk remain the preferred forms of communication (49% of responses), ahead of digital channels (29%) and printed newsletter (21%). Only 5% of respondents cited village bulletin boards, suggesting their marginal importance as a standalone channel for

information distribution, while retaining value as a supplementary medium for the digitally inactive.

In communities with high trust in local authorities and low civic engagement, the absence of opposition may be misinterpreted as acceptance of the investment. In reality, this attitude often reflects passivity or a sense of powerlessness, which risks revealing hidden concerns only during the implementation phase. Survey results indicate that 58% of respondents believe the Task will be implemented, yet a total of 30% expressed doubts or skepticism about its completion - with some respondents explicitly citing the Task's long history of delays as the reason for their skepticism. The long-term implementation cycle of the investment increases the risk of consultation fatigue and susceptibility to misinformation. A potential lack of timely and understandable communications may escalate public anxiety, undermining trust in the decision-making process.

A lack of trust in the impartiality and effectiveness of the Grievance Mechanism may result in its marginalisation.. The failure to utilize a direct communication channel with the Investor means that minor technical issues, instead of being resolved on the spot, are subjected to formalized procedures. This leads to the escalation of disputes, burdens local authorities, and generates social tensions. Instead of rapid intervention, those affected by the project receive official correspondence, which deepens their sense of distance and lack of agency.

A particular challenge remains PAP's access to reliable legal information, as even individuals with high cognitive competence encounter significant barriers when attempting to understand texts written in hermetic, highly formalized language. In the realities of today's fast-paced life, complex administrative procedures become incomprehensible to residents, which intensifies their sense of confusion and powerlessness in the face of the system.

5.2.2 Mitigation Measures

The following section presents measures to mitigate the negative social impacts identified in the impact assessment. A complete list of measures, along with the assignment of responsibility for implementation and monitoring, is provided in the table of mitigation measures, which forms an integral part of this Environmental and Social Management Plan.

With regard to impacts related to land use and ownership structure, all impact categories have been classified as significant. To mitigate these impacts, a RAP will be prepared and implemented, which will specify in detail elements such as:

- Rules for compensation payment
- Operation of the advance payment mechanism,
- Rules for property acquisition.

Another important element of mitigation measures is:

- ongoing monitoring of the situation of PAPs affected by the accumulation of land acquisitions for the Reservoir and the S8 road, with the possibility of implementing additional support measures;
- informing the PAA and pond users about the schedule for closing access to the water bodies; designating permanent fishing spots and paved boat ramps along the reservoir's shores.

The need to close the infiltration water intake for the municipalities of Kamieniec Ząbkowicki, Bardo, and Złoty Stok was identified as a high-significance impact. Other impacts in this category - temporary land use for network reconstruction, road degradation, and construction nuisances - were classified as low or medium impacts.

Mitigation measures include:

- restoring an alternative drinking water intake or intakes outside the construction area prior to decommissioning the deep wells of the existing water intake; new wells must obtain approvals from, among others, the competent sanitary authority;
- providing a replacement water source in the event of a deterioration in the quality or yield of household wells;
- reconstruction of conflicting network infrastructure (sewer systems, 110 kV and 20 kV power lines, gas pipelines, fiber-optic cables) prior to the commencement of work on a given section, ensuring the continuity of network operations;
- conducting an inventory of road surface conditions prior to construction; restoring roads after completion of work to a condition no worse than before construction, confirmed by a report with the participation of the road administrator;
- designation of construction transport routes that minimize disruption to the local community; monitoring of the continuity of access roads to fields and meadows with the obligation to designate alternative routes in the event of their closure;
- notifying residents at least 7 days in advance of planned works that are particularly disruptive.

The survey results indicate that the management of construction - related traffic is an area of special public concern. It is the only category in which negative responses outweigh positive ones (41% of respondents expect road conditions to deteriorate). This justifies treating this area as a priority topic for public communication throughout the entire duration of the Task.

The impact on livelihoods and the local economy was assessed as low or negligible on a collective scale. However, it requires the implementation of targeted measures for PAPs directly affected by land acquisition. In the survey, 7% of respondents cited the loss

of land as the main source of concern regarding their earnings - a result concentrated exclusively among PAPs affected by the land acquisition of productive land, which confirms the need for an individualized approach. Mitigation measures will be specified in detail by the RAP, which will also include elements of a plan to restore sources of income.

Regarding vulnerable groups and participation, a preference for direct contact over digital channels was observed. The skepticism of 30% of respondents regarding the completion of the Task indicates the need for consistent communication about implementation progress. Therefore, mitigation measures include, among others:

- a permanent information desk, a hotline, and a dedicated email address; a Task website with downloadable documents; communication on social media; and the distribution of flyers to households;
- ongoing monitoring of public discourse in the media with immediate responses to misinformation;
- organizing all meetings in architecturally accessible locations at various times; written materials in a font size of at least 14 points with high contrast, printed on matte paper;
- individual consultation support for people over 65 years of age and people with disabilities in a format and location adapted to their needs.

5.3 Dam safety

The Kamieniec Ząbkowicki dam is subject to the requirements of ESS4, Annex 1 (Safety of Dams). The dam is an earth dam approx. 2,700 m long, with a maximum height of 19.0 m and a crest elevation of 260.00 m a.s.l. The reservoir capacity is 54.0 million m^3 at the normal pool level (252.00 m a.s.l.) and 103.0 million m^3 at the maximum pool level (257.00 m a.s.l.). These parameters reflect the conceptual design stage and may change slightly as design work progresses. With a height exceeding 15 m, it is a large dam within the meaning of ESS4. ESS4 requires that the design and construction of a new dam be supervised by experienced and competent professionals, that the dam be reviewed by an independent panel of experts, and that the following plans be prepared and implemented: a construction supervision and quality assurance plan, an instrumentation plan, an operation and maintenance plan, and an emergency preparedness plan.

The dam is also subject to Polish requirements for hydraulic structures under the Water Law, the Construction Law and the Regulation of the Minister of Infrastructure of 4 May 2026 on the technical conditions to be met by hydraulic structures and their location. The class of the structure, which determines the design floods and safety requirements, will be confirmed in the detailed design. During operation, the dam will be subject to periodic assessments of its technical condition and safety, with the participation of the state service for the safety of water-retaining structures.

The design provides a safety margin exceeding the minimum statutory requirements, in particular with regard to overtopping, internal erosion and failure of outlet structures. The main measures are:

- a freeboard of 3.0 m above the maximum water level during the design flood (statutory minimum: 1.3 m) and 2.0 m above the extraordinary water level (statutory minimum: 0.3 m), with an additional 1.2 m parapet wall along the crest;
- self-acting emergency spillways operating without operator intervention, with a capacity at the extraordinary water level corresponding to the full design flow;
- verification of the reservoir's performance under the simultaneous occurrence of a flood and failure of the outlet structures, for both the design and the check flood;
- verification of the spillways and the stilling basin through physical and mathematical model tests;
- a continuous seepage control system, including cut-off walls connected to those of the concrete structures, filter and transition zones, and drainage;
- outlet structures designed as massive reinforced concrete structures founded on piles;
- slope stability measures in the reservoir basin, with dedicated monitoring in the Suszka area, where landslides occurred in the 1970s;
- an automatic monitoring system recording parameters relevant to dam safety, with defined normal, warning and alarm thresholds;
- local control of outlet gates with priority over remote commands, and gates designed to close automatically in the event of a power failure.

Engineering geological and hydrogeological investigations for the Task are under way, and their results will be used to confirm or adjust the design solutions.

Two emergency scenarios have been analyzed: unauthorized interference with the outlet control system leading to the full opening of all gates (peak discharge approx. 980 m^3/s), and a breach of the dam body due to internal erosion (peak discharge approx. 1,200 m^3/s). The probability of either event is assessed as very low. However, the consequences would be significant: depending on the scenario, 328 to 509 buildings, including 119 to 206 residential buildings, could be located within the inundation area. The extent of the inundation area and the exposed communities are described in Section 4.1.3 (Potential Dam-Failure Inundation Area).

An Emergency Preparedness Plan (EPP) will be prepared for the Reservoir in accordance with ESS4, Annex 1. It will set out the roles and responsibilities of the dam operator and the competent authorities, the procedures for detecting emergencies and issuing warnings, and the arrangements for warning and evacuating the population in the potential dam-failure inundation area.

The EPP will build on the arrangements already defined in the design:

- Early detection and response. The warning and alarm thresholds of the monitoring system and the local control of the outlet gates will form the basis of the emergency procedure. In Scenario 1, an uncontrolled release will be indicated by a sudden rise in the downstream water level inconsistent with current operations. In Scenario 2, readings indicating the development of seepage or internal erosion will trigger protective measures and, if the threat continues to develop, the emergency procedure.
- Notification and warning. Where there is a real threat of an uncontrolled release, the operator will immediately notify the competent crisis management and civil protection authorities and provide them with up-to-date information on the condition of the structure, water levels, outlet operation and the expected development of the situation. Decisions on warning and, where necessary, evacuating the population will be taken by these authorities on the basis of the inundation maps and the level of threat.
- Evacuation and rescue. Warning, evacuation and rescue operations will be carried out in accordance with the crisis management procedures of the competent authorities. They will cover securing the threatened areas, evacuating residents, managing traffic and restricting access, and assisting affected persons.

The EPP will include the inundation maps for both scenarios, the list of localities, residents and facilities at risk, and the communication arrangements with the crisis management authorities of the Lower Silesian and Opole Voivodeships, as the inundation area extends into both. Before the first filling, residents of the Task area and downstream communities will be informed about the safety of the Reservoir, the monitoring and early warning systems and the emergency procedures.

The dam safety assessment presented above is preliminary The dam safety instruments required under ESS4 will be prepared according to the following schedule:

Instrument	Responsibility	Timing
Updated dam break analysis and inundation mapping	[Designer]	ESIA Update II
Instrumentation plan	[Designer]	With the detailed design
Construction supervision and quality assurance plan	[PIU / Supervision Consultant]	Before the launch of the procurement of civil works
Emergency preparedness plan – draft agreed with crisis management authorities	[PIU / operator]	Before the start of construction
Operation and maintenance plan and first filling plan	[Operator]	Before the first filling
Emergency preparedness plan – final, communicated to downstream communities	[Operator]	Before the first filling

Instrument	Responsibility	Timing
Periodic safety inspections	[Operator / state dam safety service]	Throughout operation

The independent dam safety panel of experts has been appointed and will review the design, construction and the plans listed above until the first filling and initial operation of the Reservoir. The timing of each instrument will be confirmed with the Bank and reflected in the ESCP.

6 Cumulative Impacts – Reservoir Cascade

This chapter presents an assessment of the cumulative impacts of the planned Project on surface waters, hydromorphological conditions and fish migration, resulting from the operation of the Kamieniec Ząbkowicki Reservoir as part of the reservoir cascade on the Nysa Kłodzka River (Topola, Kozielno, Otmuchów and Nysa). The assessment in this respect was based on the results of hydrological and hydraulic modelling. A full and comprehensive assessment of cumulative impacts, covering the remaining environmental components, will be carried out at a later stage of the work, in accordance with the ESIA Update Plan, following the preparation of the EIA Report. The cumulative impact of the planned Project on surface waters will be primarily associated with the construction of an additional — the fifth — reservoir in the Nysa Kłodzka cascade, which currently consists of four reservoirs: Nysa, Otmuchów, Kozielno and Topola. The Kamieniec Reservoir will be the highest-elevation reservoir in the cascade. In terms of its planned surface area (10.45 km^2) and capacity (103 million m^3 at MaxPP), it will be the third-largest reservoir. The largest reservoir in the cascade is the Otmuchów Reservoir, with a surface area of 20.6 km^2 and a total capacity of 130.45 million m^3. The Nysa Reservoir is slightly smaller (20.08 km^2 and 122 million m^3), while the remaining reservoirs are considerably smaller: Topola — 3.4 km^2 and 21.68 million m^3, and Kozielno — 3.5 km^2 and 16.3 million m^3. The construction of an additional reservoir in the upper section of the existing Nysa Kłodzka cascade will affect both hydrological conditions and sediment transport, as well as biological conditions, particularly habitat availability and the migration opportunities of fish. These impacts will accumulate with the effects of the existing reservoirs, which significantly modify habitat conditions along a considerable stretch of the river and limit the migration opportunities of fish and other aquatic organisms.

The assessment considers the Task together with existing and reasonably foreseeable interventions within the Nysa Kłodzka system that may affect river continuity and downstream hydrological and hydromorphological conditions. Existing interventions include the Topola, Kozielno, Otmuchów and Nysa reservoirs, operated as a cascade, and the weirs in Janowiec, Opolnica and Młynów. Reasonably foreseeable interventions include the construction or modernisation of fish-migration facilities at the existing

structures and aggregate extraction within the reservoir basin (to be completed during the construction phase).

The results of modelling the flow of water through the planned Kamieniec Reservoir indicate that it will significantly reduce the magnitude of flood waves reaching the subsequent reservoirs in the cascade. This will affect their operation in such a way that, following the construction of the Kamieniec Reservoir, during the passage of a flood wave with a probability of p = 1%, a noticeable decrease in the water-surface elevation in the other existing reservoirs of the Nysa Kłodzka cascade will occur. As a result, these reservoirs will maintain a constant and greater flood-control capacity than at present. This will also lead to smaller changes in the habitats of the littoral zones of the existing reservoirs during flood events. The creation of the new reservoir will also reduce the outflow from the Nysa Reservoir—the lowest-lying reservoir in the cascade—which will mitigate the effects of flood events, such as bank erosion and habitat transformations within the river channel, in the section downstream of the reservoir system. The impact of the planned Kamieniec Reservoir on the section of the Nysa Kłodzka River downstream of the dam and the Topola Reservoir will be primarily associated with a change in the flow regime, from the existing regime—with an amplitude close to natural—to an artificially regulated regime, in accordance with the adopted water-management operating instructions for the Kamieniec Reservoir. This will result in the reduction of flood events through the use of the planned reservoir's flood-control capacity, as well as the regulation of low flows through the use of its storage capacity, within the range between the Normal Pool Level (NPP) and the Minimum Pool Level (MinPP). In the case of flood events, the differences will concern both terrestrial habitats dependent on water, along the section of the Nysa Kłodzka River from the Kamieniec Reservoir dam to the backwater zone of the Topola Reservoir, as a result of the restriction of periodic flooding, and aquatic habitats in the Nysa Kłodzka River and the backwater zone of the Topola Reservoir. The interruption of downstream sediment transport by the Kamieniec Reservoir dam is predicted, together with the initiation of channel incision in the Nysa Kłodzka River downstream of the dam and a significant reduction in sediment accumulation in the backwater zone of the Topola Reservoir (Figure 8). The modelling determined the rate and scale of channel incision in the Nysa River. The modelling results indicate that sediment accumulation in the backwater zone of the Topola Reservoir will be significantly reduced, while a similar process will be initiated in the backwater section of the Kamieniec Reservoir, at the boundary of the area inundated at the Normal Pool Level (NPP), as well as in the river upstream of the existing weir in the village of Janowiec (Figure 9). The sediment-transport modelling results indicate a possible need to introduce, as part of the mitigation measures, so-called river nourishment, i.e. replenishment of the material forming the channel bed in areas of intensified channel incision identified downstream of the planned Kamieniec Reservoir dam. The construction of another reservoir in the Nysa Kłodzka cascade will not significantly alter sediment-transport conditions in the river sections between the successive existing reservoirs—that is, downstream of the Topola

Reservoir—or in the free-flowing section of the Nysa Kłodzka River downstream of the Nysa Reservoir. These conditions have already been significantly modified by the existing reservoir system.

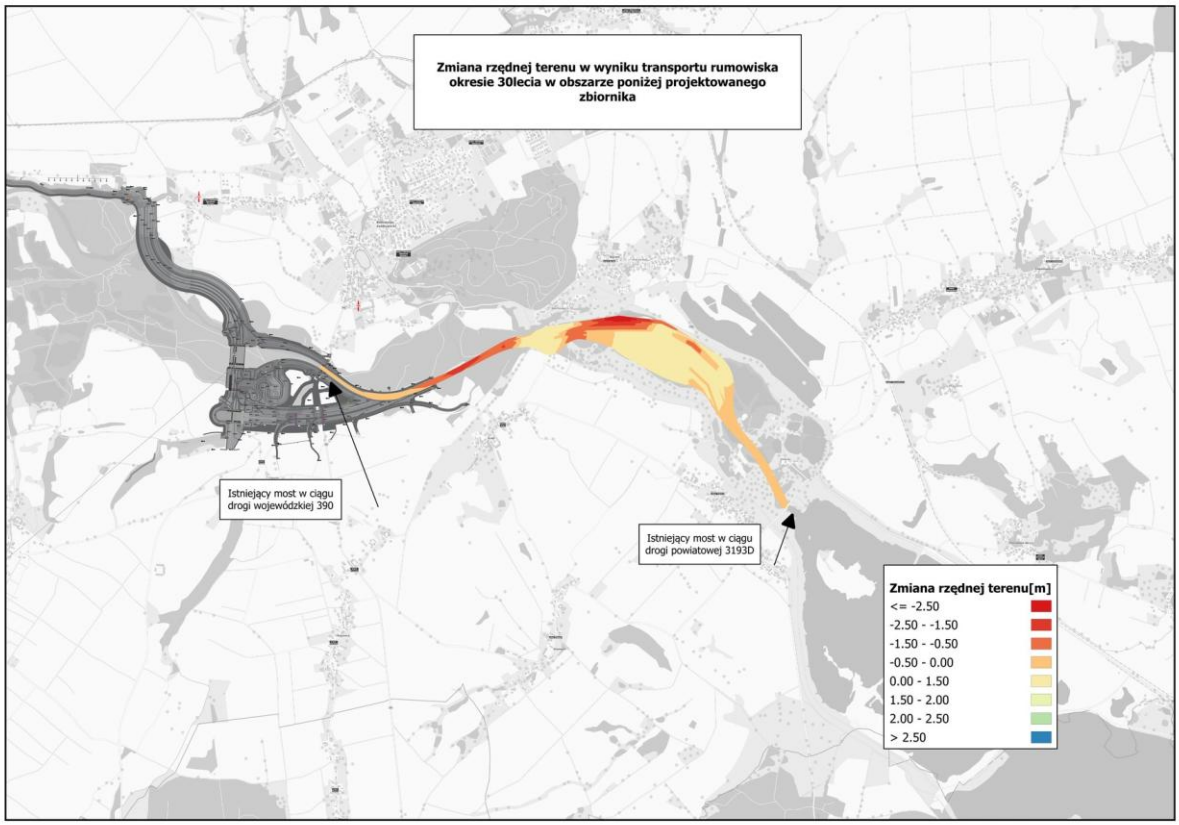


Figure 7 Change in ground elevation resulting from sediment transport over a 30-year period in the area downstream of the planned Kamieniec Reservoir (the section extending to the backwater zone of the Topola Reservoir)

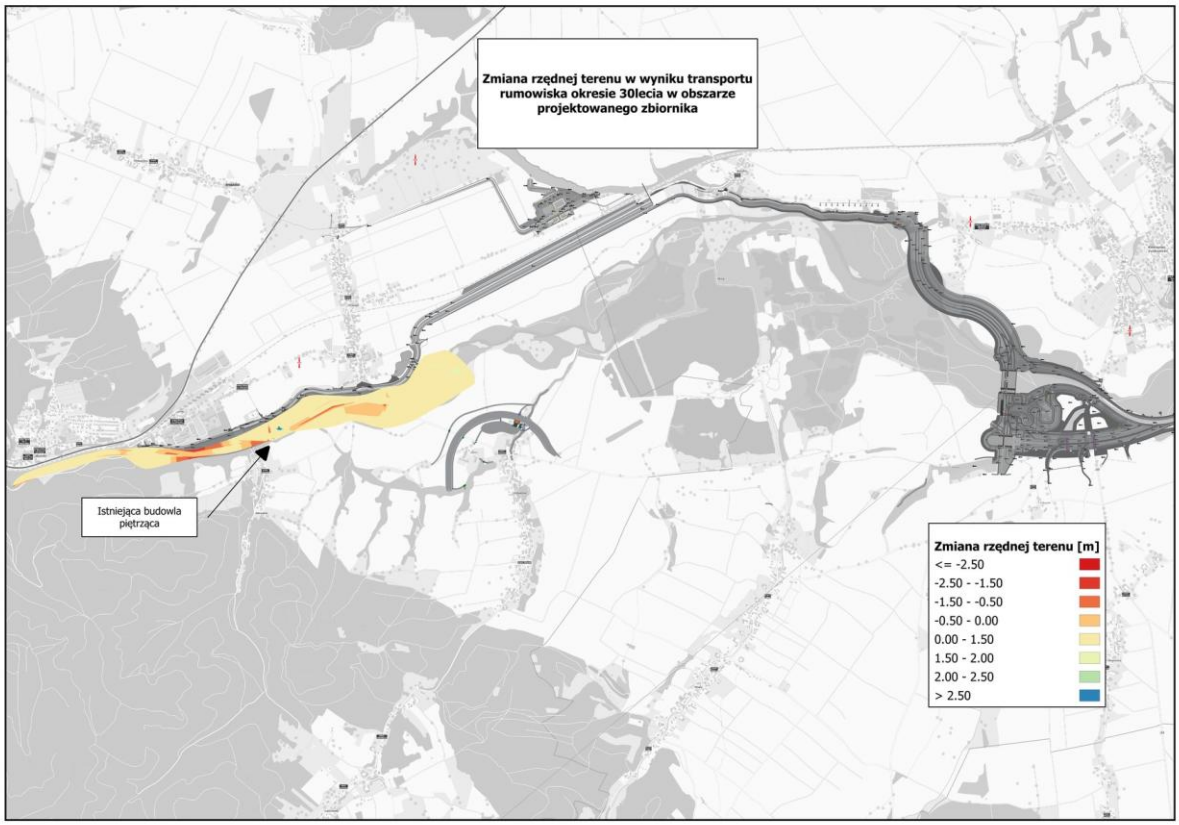


Figure 8 Change in ground elevation resulting from sediment transport over a 30-year period within the area of the planned Kamieniec Reservoir (the NPP backwater zone and the area of the existing water-level control structure in Janowiec).

An important element of the assessment of the cumulative impacts of the planned Kamieniec Reservoir and the existing reservoir cascade on the Nysa Kłodzka River is the effect of these structures on fish fauna and the ecological continuity of the river. This assessment requires a distinction to be made between impacts on species and populations currently occurring in the Project area and impacts on the potential future restoration of migration by diadromous species. The existing dams of the Nysa, Kozielno and Topola reservoirs are equipped with facilities for fish migration, whereas the Otmuchów Reservoir dam is currently not equipped with a fish pass. The effectiveness of the existing fish-migration facilities has not been conclusively confirmed, and some of them were damaged by the 2024 flood. According to the information available as at the date of preparation of this assessment, activities are being carried out or planned involving the maintenance and servicing of the fish pass at the Nysa Reservoir, the modernisation of the fish pass at the Kozielno Reservoir, the construction of a fish pass using the existing flood-relief channel at the Otmuchów Reservoir, and the construction of a fish pass at the Michałów weir. These measures are intended to improve the ecological continuity of the Nysa Kłodzka River along the section extending from its confluence with the Odra River to the section located upstream of the Topola Reservoir. The planned Kamieniec Reservoir dam will constitute another transverse structure within the Nysa Kłodzka River system. If effective fish-migration solutions are not implemented, it could further restrict the movement of fish currently occurring in the river and limit the

possibility of restoring the future migration of diadromous species. For this reason, the planned structure should be equipped with functional solutions enabling fish migration both upstream and downstream. Based on the results of ichthyological surveys conducted in the area of the planned Project, no ship sturgeon, Atlantic salmon or sea trout were recorded. One individual European eel was recorded, however. This finding confirms the occurrence of European eel in the analysed section of the Nysa Kłodzka River; however, because only a single individual was recorded and the survey was conducted on a one-off basis, it does not allow the abundance, persistence or structure of the local population of this species to be determined. The failure to record ship sturgeon, Atlantic salmon and sea trout relates to the spatial and temporal scope of the inventory survey. It does not rule out the incidental occurrence of individual specimens or the future return of these species following improvements in the continuity of the river system or the implementation of restoration measures.

The results of the 2022 national fish-fauna monitoring programme for rivers may provide a supplementary source of information on the occurrence of these species within the Nysa Kłodzka and Odra river systems. However, they should be interpreted with reference to specific survey sites and dates, rather than being used as a basis for excluding the occurrence of these species along the entire migration route. Ensuring the passability of the planned structure is therefore important both in view of the requirements of species currently occurring in the Nysa Kłodzka River, including the European eel confirmed during the inventory survey, and in view of the historical and future migratory potential of the river for other diadromous species, as identified in planning documents. The realisation of this potential will depend on the implementation of measures aimed at improving the passability of the Nysa Kłodzka and Odra rivers, as well as on achieving functional continuity along the entire migration route connecting the analysed section with marine waters. According to the study Assessment of the Needs and Priorities for Restoring the Morphological Continuity of Rivers in the Context of Achieving Good Status and Potential of Water Bodies in Poland (Błachuta et al. 2010, National Water Management Authority, Warsaw), the following requirements for migratory passability were identified:

- Nysa Kłodzka River – from its confluence with the Odra River to the confluence with the Ścinawa Niemodlińska River (km 0.0–12.2) – longitudinal connectivity for sturgeon (also meeting the requirements of Atlantic salmon and sea trout);
- Nysa Kłodzka River, from the confluence with the Ścinawa Niemodlińska River to the Biała Lądecka River (km 12.2–135.1) – longitudinal connectivity for Atlantic salmon (also meeting the requirements of sea trout);
- Nysa Kłodzka River, from the confluence with the Biała Lądecka River to the Bystrzyca River (km 135.1–150.2) – longitudinal connectivity for Atlantic salmon (also meeting the requirements of sea trout).

The Project area is located within the section identified in the cited study as being important for maintaining or restoring migratory connectivity for diadromous fish, which historically migrated along the Nysa Kłodzka River to its upper reaches and main tributaries, including the Bystrzyca Dusznicka and Biała Lądecka rivers. The study also indicates that the Nysa Kłodzka catchment contains approximately 60 ha of potential spawning grounds for diadromous salmonids, including spawning grounds located in tributaries. The findings cited above should be interpreted as defining the requirements for maintaining or restoring, in the future, the morphological continuity of the river and its potential migratory function. The mere identification of individual species in a planning document does not constitute confirmation of the presence of viable, functional populations of those species in the area of the planned Project.

At the same time, the Nysa Kłodzka River serves as a migration corridor for species currently occurring in the river, including potamodromous species. If effective fish-migration solutions are not implemented, the planned reservoir could further restrict this function. It is therefore necessary to apply measures ensuring bidirectional fish migration, designed primarily to meet the requirements of species currently occurring in the river, including the European eel and protected species recorded during the inventory survey, while also taking into account the possibility of restoring the migration of other diadromous species in the future.

Although the section of the Nysa Kłodzka River that will be inundated by the planned reservoir is not an optimal spawning ground for salmonid species, it constitutes a valuable habitat for riverine fish fauna and is a potential spawning ground for lithophilic species such as barbel, nase, chub and dace.

A fish pass is planned at the dam of the planned Kamieniec Reservoir. Due to a number of factors making it difficult to apply a uniform type and design along the entire length of the fish pass—including, in particular, the variable water level in the reservoir—a mixed configuration will be used, making optimal use of the site-specific, hydraulic and environmental conditions. Apart from the technical section, comprising the inlet structure and the gallery running through the dam body, the fish pass will be constructed in the form of a channel imitating a natural stream, with a preserved gravel-and-stone bed and a sinuous course.

The cumulative impact of the planned Project and the existing barriers within the Nysa Kłodzka cascade will vary over time. During the construction of the Kamieniec Reservoir and the construction or modernisation of fish-migration facilities at the existing dams, temporary restrictions on the passability of the analysed section of the river may occur. Such restrictions also exist under current conditions, particularly due to the absence or limited functionality of fish-migration facilities at some of the existing water-level control structures. During the operational phase of the Kamieniec Reservoir, following the construction and commissioning of the planned fish pass and the completion of the construction or modernisation of fish-migration facilities at the structures located

downstream, the passability of the Nysa Kłodzka migration corridor may improve along the section from its confluence with the Odra River to the backwater zone of the planned Kamieniec Reservoir. However, improved passability of the analysed section will not be equivalent to the restoration of the entire migration route for diadromous species, and its functionality will also depend on the passability of the remaining transverse structures within the Nysa Kłodzka and Odra river systems. The extent of this improvement will nevertheless depend on the actual effectiveness of the individual facilities, hydrological conditions, the operating regime of the structures and the provision of migration opportunities in both directions. The possibility of further fish migration to the unmodified section of the Nysa Kłodzka River, including the area of the Natura 2000 site "Nysa Kłodzka Gorge near Morzyszów" PLH020043, will additionally depend on restoring the functionality of the fish-migration facilities at the weirs in Janowiec and Opolnica, as well as on the passability of the remaining barriers within the river system. The actual effectiveness of the implemented solutions should be verified through monitoring. The monitoring should enable an assessment of the fish's ability to locate the entrance to the facility, the effectiveness of passage through the structure, the time required to overcome the barrier, the safety of downstream migration and the effectiveness of protective measures preventing fish from entering the turbines. If the effectiveness is found to be lower than assumed, corrective measures should be implemented with regard to the design of the facilities or the operating regime of the structure. A separate aspect of the cumulative impact of the reservoir cascade is the restriction of downstream fish migration. With regard to Atlantic salmon and sea trout, the available survey results do not confirm the presence of functional populations of these species in the area of the planned Project. Therefore, there are insufficient grounds to conclude that the planned reservoir, in combination with the existing system of four water-level control structures in the Nysa Kłodzka cascade, will directly affect the current downstream migration of smolts of these species from the analysed section of the Nysa Kłodzka River. If migratory continuity is restored in the future and Atlantic salmon or sea trout return to the upper part of the catchment, the presence of additional reservoirs could result in delays to downstream migration, loss of orientation in impounded sections, increased exposure to predation, and a risk of injury or mortality when passing through hydropower facilities. These impacts are currently potential in nature and concern the future possibility of restoring migration, rather than confirmed local populations of Atlantic salmon or sea trout. If the population of ship sturgeon is restored in the future and functional continuity of its migration route is achieved, the planned reservoir, together with the existing water-level control structures, will not affect this species, because according to published sources, the historical spawning grounds of ship sturgeon were located in the lower course of the Nysa Kłodzka River, downstream of the Ścinawa Niemodlińska River (km 0.0–12.2). With regard to European eel, the impact on migration should be considered in relation to a species currently occurring in the analysed section of the Nysa Kłodzka River. The scale of the impact will depend, among other factors, on the abundance and

distribution of the species, the technical parameters of the hydropower plant, its operating regime, and the effectiveness of the protective measures and fish-migration facilities applied. The impacts resulting from the construction of the Kamieniec Reservoir, including their cumulative effects in combination with the impacts of the existing reservoirs, should be reduced through the application of appropriate mitigation measures. These measures should include, in particular, the construction and maintenance of a functional fish passage, solutions enabling safe downstream migration, protection of the hydropower plant's intake structures against fish entering the turbines, and measures aimed at improving the passability of the remaining water-level control structures within the Nysa Kłodzka system. The construction of an additional reservoir in the cascade will result in an additional impact on fish migration and the ecological continuity of the Nysa Kłodzka River by increasing the number of reservoirs in the cascade and the total length of the Nysa Kłodzka section affected by impoundment. However, in addition to these numerical parameters, the impact assessment should take into account the effectiveness of the planned fish-migration facilities, the possibility of migration in both directions, hydrological conditions, the operating regime of the hydropower plant and reservoir, the passability of the remaining structures, and the results of post-construction monitoring.

The following assessments cannot be completed by Project appraisal, as the Task is at the conceptual design stage. They will be addressed in the next iterations of the ESIA, in accordance with the ESIA Update Plan (Section 1.1.1), and in any case before the launch of the procurement of civil works, in line with the ESCP:

- Comprehensive dam safety assessment in accordance with ESS4, Annex 1. The detailed design of the dam and the results of the geotechnical and hydrogeological investigations, which are currently under way, are not yet available. The assessment will begin in Update I with the updated dam break analysis and will be completed with the detailed design, subject to review by the independent dam safety panel of experts appointed for the Task. The dam safety instruments will be prepared according to the schedule in Section 5.3.
- Public health risks, including waterborne and vector-borne diseases related to stagnant or slow-moving water, taking climate change into account. The assessment requires the results of the water quality analyses for the Reservoir, which are being carried out for the EIA report.
- Drowning and water-related accidents. The risk depends on the detailed design of the recreational facilities, the boat ramp and the wharf, and on the rules for public access to the shores. The assessment will be carried out in Update III.
- Water quality, including safe drinking water sources and the availability of water supplies. The location, yield and water quality of the replacement intake, and the

impacts on private wells, depend on the hydrogeological documentation currently under way. The water quality in the Reservoir is being analyzed for the EIA report.

7 Analysis of Alternatives

7.1 Scenario without the Task

This scenario pertains to a situation where the Task is not implemented, which is equivalent to abandoning the construction of the Kamieniec Ząbkowicki Reservoir. In practice, this means maintaining the current use and development of the site in question and the absence of impacts associated with the implementation of the project. Abandoning the Task will not change the existing environmental and socio-economic conditions.

However, abandoning the construction of the reservoir prevents the achievement of the goal of improving flood safety in the Nysa Kłodzka catchment area. The scenario will lead to the perpetuation of flood risk in areas located downstream of the planned reservoir. These areas, which include large and heavily urbanized zones, such as the towns of Nysa and Lewin Brzeski, will remain protected by the existing reservoirs comprising the Nysa cascade of reservoirs; however, these reservoirs collectively will not be able to reduce the flood wave to a level that guarantees the safe passage of floodwaters. As a result, the areas located in the river valley will remain vulnerable to the effects of flood waves, particularly during heavy rainfall and rapid snowmelt. Without the reservoir, it will not be possible to ensure comprehensive and effective protection of these areas, which will lead to a continued high level of flood risk.

Abandoning the reservoir's construction also represents an unfavorable scenario in the context of climate change adaptation, as it limits the region's ability to build climate resilience against extreme events.

7.2 Location Options

In the context of the Task, there is no rational alternative to the proposed location of the Kamieniec Ząbkowicki Reservoir. The Reservoir's location is the result of many years of conceptual work and was determined during the initial design phase of the Task. Given the Reservoir's intended purpose and existing conditions, no other locations were considered.

It is assumed that the reservoir will serve as a functional extension of the existing reservoir cascade, expanding it from the current four to five facilities: Topola, Kozielno, Otmuchów, Nysa, and Kamieniec Ząbkowicki Reservoir. This significantly determines the location of the Task, as it requires the reservoir to be situated upstream of the existing facilities. Furthermore, the placement of retention reservoirs in mountainous and foothill regions is very limited. This is mainly due to the relatively steep longitudinal gradients of the rivers

and terrain, which consequently limits the potential reservoir capacity. In this regard, the location of the Kamieniec reservoir is optimal, as it utilizes the first widening of the river valley, below the descent from the mountainous regions. The possibilities for changing the reservoir's location are limited, given that the areas located upstream are characterized by a narrow, deeply incised valley, which significantly restricts retention capacity.

Below the selected reservoir location, there are already existing retention reservoirs, so it is not possible to locate another reservoir in this area.

The proposed location is also the most socially acceptable, as a large portion of the land designated for the planned Kamieniec Ząbkowicki Reservoir consists of anthropogenically transformed areas. Currently, a natural resource mine is located within the area of the planned reservoir basin. Using land that is currently being mined limits the need for new environmental alterations and reduces potential social conflicts.

7.3 Technological Variants

7.3.1 Dry reservoir

The multifunctionality of the planned reservoir - meaning its ability to perform both its primary and additional functions - will be achieved by filling the reservoir basin with a permanent water impoundment. The water retained in this manner will enable the reservoir to perform its additional functions, while the remaining reservoir capacity, supported by preemptive discharge, will serve as a flood reserve. A dry reservoir would not meet the primary objectives set for the Task. Additionally, a dry retention reservoir would not be able to mitigate the effects of drought and would be less favorably received from a public perspective. Compared to the proposed wet reservoir, a dry reservoir limits the potential for community engagement, does not enhance the region's attractiveness, and does not provide opportunities for its use in renewable energy production.

7.3.2 Alternative Option

As part of the design work, possible functional, spatial, technical, and operational variants of the reservoir were analyzed. The first concept designed involved constructing a reservoir approximately 250 hectares larger than the variant selected for implementation, located on the north side of the existing railway line. The concept called for permanent water impoundment in this area and allowed for aggregate extraction from beneath the water.

As design work progressed, this option was rejected due to excessive costs and its social and environmental impacts. Implementing the reservoir under this option would have required the reconstruction of the railway line, involving the construction of an overpass over the water surface, as well as the removal of the Przyłęk-Suszka road section and the construction of a new connection around the reservoir's perimeter.

The option selected for implementation represents an optimization of the option described above. The investment option is characterized by parameters that strike a balance between environmental, hydrological, and socio-economic objectives. The implementation option will provide a large permanent flood control reserve capacity of approximately 49 million m^3. Additionally, in this option, the anticipated minimum pool levels will allow for the creation and utilization of an additional flood reserve through the implementation of preemptive releases, based on forecasts and guidance from operational centers.

The technological alternative variant of the Task involves raising the permanent pool level of the NPL to a MASL of 253 m. This is 1 m higher than the variant selected for implementation. The capacity of the permanent flood reserve in the alternative option will be 50 million m^3, and the total storage volume up to the MaxPL will be up to 113 million m^3. The design solutions in the alternative option are identical to those in the selected implementation option. Compared to the investment variant, the alternative variant increases permanent water retention by 9.0 million m^3 of retained water. For both variants, the minimum pool level, equal to MASL 249.00 m.

In principle, thanks to the greater volume of retained water (higher NPL), the reservoir's potential for use in drought mitigation, energy generation, and recreation also increases. The reservoir's active storage capacity - i.e., the volume intended for use in accordance with the reservoir's operational objectives under normal operating conditions - will be 31 million m^3. To maintain the level of flood protection at the level of the variant selected for implementation, the elevation of the maximum pool level (MaxPL) will be raised to MASL 258 m. In this scenario, the inundation area at MaxPL (MASL 258 m) in the alternative option extends approximately 1 km above the existing weir in the village of Janowiec.

A higher pool level results in a larger area subject to permanent backwater and, correspondingly, a larger area within the reservoir's inundation zone during its maximum fill. The alternative option with a wider floodplain extent at NPL differs significantly in terms of its impact on surface waters from the option selected for implementation. Furthermore, at the NPL (253 MASL), the impoundment additionally covers a 2-km ling section of the Nysa Kłodzka River, along with the trees growing on its banks, which would be cut down if the NPL's reach were larger, but which will remain intact in the variant selected for implementation. The section of the river in question is semi-natural in character and, according to current estimates from the inventory, has significant ecological value.

8 Public Consultations

Taking into account the requirements regarding stakeholder engagement and information disclosure under ESS1 and ESS10, the Client (Project Owner / Investor) has taken steps to involve stakeholders in the ESIA preparation process. Stakeholder engagement is treated as a continuous and phased process, the proper implementation of which aims to minimize the risk of social conflicts related to the implementation of the Task. The stakeholder identification and analysis, engagement methods and schedule, measures for vulnerable groups and the Grievance Redress Mechanism are set out in the Stakeholder Engagement Plan (SEP) prepared for the Task.

During the ESIA preparation phase, the Client established consultation points in the municipalities of Kamieniec Ząbkowicki and Bardo, where stakeholders - including residents and local communities within the Task's area of impact - can obtain information about the project, review documentation, and submit questions and comments.

The Client remains in constant contact with stakeholders, striving to achieve the objectives of public participation in the ESIA preparation process, i.e., ensuring an adequate level of information provision and receiving feedback, which must be considered in the proper preparation of the ESIA.

Individual consultations with persons whose properties will be subject to physical displacement in connection with the implementation of the Task, including issues related to compensation procedures and financial incentives, are described in the RAP.

Once work on the draft of this ESIA is completed and it is submitted to the World Bank for review, the documentation will be made available on the RZGW website and at consultation points at least 30 days prior to the scheduled consultation meeting. The consultation is planned for Oktober 2026, before the Bank's appraisal of the Project. During this period, stakeholders will be able to submit comments and feedback on the draft ESIA.

In line with the SEP, the following stakeholders to be consulted include:

- the authorities of the municipalities of Kamieniec Ząbkowicki and Bardo and the village administrators of Janowiec, Ożary, Suszka, Dzbanów and Przyłęk, the Ząbkowice Śląskie County Office, the Lower Silesian Voivodeship Office, the Marshal Offices of the Lower Silesian and Opole Voivodeships, the Regional Director for Environmental Protection in Wrocław, the Lower Silesian Voivodeship Monuments Conservator, the National Support Centre for Agriculture and the Agency for Restructuring and Modernization of Agriculture;
- residents of the directly affected localities: Przyłęk and Dzbanów (municipality of Bardo) and Suszka, Ożary, Byczeń, Śrem, Topola and Janowiec (municipality of Kamieniec Ząbkowicki);

- project-affected persons: owners of properties to be acquired, tenants and users of agricultural land within the Reservoir area, and the Byczeń aggregate mine and its workforce;
- groundwater users and owners of private wells, and former residents of the village of Pilce;
- residents of the localities benefiting from flood protection: Kamieniec Ząbkowicki, Byczeń, Bartniki and Topola, and residents of the municipalities of Bardo, Paczków, Otmuchów and Nysa;
- interested groups: environmental organizations, the Polish Angling Association branch in Ząbkowice Śląskie, the Roman Catholic parishes of Kamieniec Ząbkowicki and Suszka, local tourism and catering businesses, the Lower Silesian Agricultural Advisory Centre, and the cultural centres in Kamieniec Ząbkowicki and Bardo;
- utility companies and infrastructure managers: the General Directorate for National Roads and Motorways, the Ząbkowice Śląskie County Roads Authority, PKP Polskie Linie Kolejowe S.A., TAURON Dystrybucja S.A., ZWiK sp. z o.o. in Nowa Ruda and the Bardo Śląskie Forest District.

The local community will be informed of the availability of the documentation for consultation at the start of the disclosure period through:

- announcement on the Wrocław RZGW website,
- announcements on the websites and bulletin boards of the municipalities of Kamieniec Ząbkowicki and Bardo,
- announcements in local media,
- individual invitations sent to key stakeholders, in particular the mayors of Kamieniec Ząbkowicki and Bardo, the village administrators of Janowiec, Ożary, Suszka, Dzbanów and Przyłęk, the Head of the Ząbkowice Śląskie County, ZWiK sp. z o.o. in Nowa Ruda, the Bardo Śląskie Forest District, the General Directorate for National Roads and Motorways and the Polish Angling Association branch in Ząbkowice Śląskie and the state-owned breeding farm OHZ.

Following the conclusion of the consultation period, an open consultation meeting will be organized to discuss the comments and feedback submitted by stakeholders. Comments submitted by stakeholders during the consultation will be analyzed and, where appropriate, incorporated into the final version of the ESIA.

9 Environmental and Social Management Plan (ESMP)

The Environmental and Social Management Plan (ESMP) for the Task has been prepared as an appendix to this ESIA and constitutes Appendix 11.1. The ESMP specifies mitigation measures for the preliminarily identified environmental and social risks and impacts. For each identified risk, the monitoring methodology and frequency, as well as institutional responsibility for implementation, are specified. The plan covers both the construction and operation phases of the reservoir.

The plan was developed in accordance with the environmental and social standards (ESS) derived from the World Bank's Environmental and Social Framework (ESF), ensuring that the planned activities comply with their requirements.

This version of the ESMP is a framework document, corresponding to the current stage of the Task's preparation. Once the environmental inventory is completed, the environmental permit (decision of environmental conditions) is obtained, and during the preparation of the tender for construction works, a Construction Environmental and Social Management Plan (C-ESMP) will be developed, which will serve as the basis for the implementation of environmental and social measures by the Construction Contractor.

10 Stakeholder engagement

Stakeholder engagement is an integral part of the preparation and implementation of the Task "Construction of the Kamieniec Ząbkowicki Reservoir on the Nysa Kłodzka River" and is carried out in accordance with the World Bank's ESS10 requirements (Stakeholder Engagement and Disclosure).

The SEP defines a systematic approach to stakeholder engagement throughout the Task's lifecycle - from the early design phase through construction to the Reservoir's operational phase. The document includes:

- objectives and principles of engagement, based on ESS10 requirements and the principle of meaningful consultation;
- a stakeholder analysis, including an impact-interest matrix and psychosocial profiles of key groups;
- an engagement strategy, including communication channels (public meetings, information points for PAP at the municipal offices of Kamieniec Ząbkowicki and Bardo, the PGW WP website and Facebook profile, direct communication with PAP), engagement methods tailored to vulnerable groups, and a schedule of communication activities;
- information disclosure principles, including the scope and deadlines for making project documentation public (ESIA, RAP, ESMP);

- rules for monitoring and updating the SEP, including the conditions triggering the need to update the document.

The SEP is subject to updates at key stages of the Task's implementation, in particular after obtaining the IPIP/PfRI decisions and prior to the mobilization of the Construction Contractor.

A detailed description of the stakeholder engagement process, stakeholder identification, methods and communication channels used, the schedule of activities, and the Grievance Redress Mechanism is included in the SEP, which constitutes Annex 11.2 to this ESIA.

11 Grievance Redress Mechanism

As part of the "Construction of the Kamieniec Ząbkowicki Reservoir on the Nysa Kłodzka River" Task, a Grievance Redress Mechanism (GRM) has been established, in accordance with the World Bank's ESS10 requirements and ESF standards. The GRM is an integral part of the Task's environmental and social management system and operates in close coordination with the SEP, ESIA, and RAP.

The GRM provides all Task stakeholders with effective, transparent, and free access to a mechanism for submitting requests, opinions, comments, grievances/complaints, and objections related to the preparation and implementation of the Task. The GRM is operational from the early design stage and remains active throughout the Task's entire lifecycle.

The mechanism covers all environmental, social, and technical issues related to the Task concerning all relevant Environmental and Social Standards, with the exception of employee complaints covered by ESS2. These grievances are addressed through a separate mechanism for employees.

The GRM also includes a dedicated procedure for the safe, confidential, and victim-centered handling of reports regarding sexual exploitation and abuse and sexual harassment (SEA/SH), in accordance with World Bank guidelines (*Good Practice Note on Addressing SEA/SH in Investment Project Financing involving Major Civil Works, Third Edition, October 2022*).

In order to ensure full accessibility, the system offers the following channels for submitting complaints:

1. By using the standard grievance forms (optional) available at:
    a. Project Office:
    PGW WP RZGW Wrocław (SWECO Polska Sp. z o.o.)34. Norwida St., 50-950 Wrocław. Open Monday to Friday from 8 a.m. to 3 p.m., except public holidays.

b. Consultant's Office: SWECO POLSKA sp. z o.o, 61. Armii Krajowej St. building C, 50-541 Wrocław, open Monday to Friday from 8 a.m. to 4 p.m., except public holidays.
c. at the information point for PAP:

Municipal Office of Kamieniec Ząbkowicki, conference room no. 13 (first floor), 26. Ząbkowicka St., 57-230 Kamieniec Ząbkowicki	Town and Municipal Office of Bardo, Rynek 2, 57-256 Bardo

The consultation point's work schedule is available on the websites of SWH PW, Municipal Office of Kamieniec Ząbkowicki, Municipal Office of Bardo, on the SWH PW's Facebook page, and in paper form on notice boards in towns located within the Reservoir's area of impact.

Grievance forms and a brief information leaflet on the GRM — describing available channels, deadlines, and submitting parties' rights — will be available in paper form at all locations listed above, as well as on the websites and Facebook page listed above.

2. Dedicated telephone/SMS tel. +48 880 798 106
3. E-mail: kamieniec@wody.gov.pl
4. Traditional post/e-delivery

State Water Holding Polish Waters

Regional Water Management Authority in Wrocław

34. Norwida St., 50-950 Wrocław

AE:PL-54203-72699-VFJHB-21

5. Meetings and consultations - the possibility to submit a verbal/in wirting grievance during:

- Public consultations
- Duty shifts at the Information Point for PAP,
- Field meetings with the Consultant's personnel and PIO representatives.

Note: Verbal grievances require the person receiving them to draw up a written record.

As per the World Bank's requirements, the system also accepts anonymous complaints. They are considered on an equal footing with complaints submitted under a name, but the lack of contact details makes it impossible to provide feedback to the complainant.

The mechanism is included in the GRM document constituting Annex 11.3 to this ESIA.

12 Monitoring and Reporting Plan

As part of the implementation of the Task, environmental and social monitoring is planned to enable ongoing assessment of the investment's impact on the environment and the local community, as well as verification of the effectiveness of the measures implemented to mitigate the Task's impacts.

A preliminary Environmental and Social Management Plan (ESMP) has been prepared for this ESIA, which identifies key mitigation measures and the scope of their monitoring. This document is of a framework nature and, like the impact assessment, will be subject to further refinement during subsequent stages of the Task's preparation and implementation.

Monitoring will be conducted both during the execution of works and during the reservoir's operational phase. Its scope stems from the nature of the Task and the identified impacts and primarily covers those elements of the environment and the social environment that may be most vulnerable to the Task's impact.

In particular, ongoing monitoring is planned for:

- changes in the soil and water environment related to the construction of hydrotechnical structures,
- hydrological and hydrogeological conditions within the task area,
- the condition of natural habitats and the functioning of fauna, including the ability of organisms to move and fish to migrate,
- the effectiveness of the mitigation measures implemented, including fish pass,
- the impact of the task on protected areas and the functioning of the river valley,
- the protection of cultural heritage, including archaeological sites and historic structures,
- nuisances associated with the execution of works, such as noise, dust, or transportation arrangements,
- impacts on the local community, including land acquisition and livelihoods of PAPs,
- community health and safety, including traffic and public health,
- dam safety, including the implementation of Emergency Preparedness Plan required under ESS4,
- grievances submitted through the GRM.

A complementary element will be communication with stakeholders and the operation of a complaint mechanism, enabling the submission of comments and issues related to the

Task's implementation. These reports will be analyzed and, if necessary, will serve as the basis for implementing corrective actions.

During the Task's implementation, unusual situations and extraordinary events, such as failures or incidents that could cause unforeseen impacts, will also be monitored. In such cases, appropriate remedial actions will be implemented and further evaluated.

The results of the monitoring will be documented and used for the ongoing assessment of the Task's progress. This information will be included in reports prepared during the execution of works - typically on a monthly or quarterly basis, depending on the intensity of works - as well as in a summary report prepared upon completion of the Task implementation phase.

These reports will be submitted to the competent authorities and - to the extent required - to the financing institution, in accordance with the adopted reporting principles and the provisions of the preliminary Environmental and Social Management Plan (ESMP).

During the reservoir's operational phase, reporting will be conducted in accordance with the requirements set forth in administrative decisions and applicable regulations.

In the event of significant non-conformities or extraordinary events, ad hoc reports will be prepared, and appropriate corrective actions will be taken.

The monitoring method will be modified as necessary during the Task's implementation, depending on the progress of work, monitoring results, and reported issues and needs identified during the task's implementation.

13 Appendices

13.1 Environmental and Social Management Plan (ESMP)

13.2 Stakeholder Engagement Plan

13.3 Grievance Redress Mechanism

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