



Państwowe
Gospodarstwo Wodne
Wody Polskie

*State Water Holding Polish Waters
Regional Water Management Authority in Cracow*

ENVIRONMENTAL MANAGEMENT PLAN

DRAFT

ODRA-VISTULA FLOOD MANAGEMENT PROJECT

Loan Agreement no. 8524 PL

Environmental category B – in accordance with WB OP 4.01

Component 3:

Flood Protection of the Upper Vistula

Subcomponent 3A:

Flood Protection of Upper Vistula Towns and Cracow

Works Contract 3A.6

Construction of a pumping station for mobile pumps
to drain the Lesisko complex

<i>Issue</i>	<i>Date</i>	<i>Authors</i>	<i>Verified by</i>	<i>Client's approval</i>	<i>Description</i>
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ODRA-VISTULA FLOOD MANAGEMENT PROJECT

co-financed by:

World Bank - International Bank for Reconstruction and Development (WB)

– Loan Agreement no. 8524 PL,

Council of Europe Development Bank (CEB)

– Frame Loan Agreement no. LD 1866,

The European Union Cohesion Fund (OPIE 2014-2020), and

State Budget

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Project Implementation Unit:

State Water Holding Polish Waters

represented by the Director

of Regional Water Management Authority in Cracow

with its office at 22. Marszałka J. Piłsudskiego Street, 31-109 Cracow

Document developed by:

State Water Holding Polish Waters

represented by the Director

of Regional Water Management Authority in Cracow

OVFM PIU

AECOM Polska Sp. z o.o.

Technical Assistance Consultant

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LIST OF BASIC DEFINITIONS AND ABBREVIATIONS APPLIED IN THIS EMP

Name	Description
BGW	Body of Groundwater
BIOZ Plan	Health and Safety Plan developed based upon Article 21a of the Act of July 7, 1994 – Building Law Act
BSW	Body of Surface Water
CE	Contract Engineer
CEB	Council of Europe Development Bank https://coebank.org/en/
Consultant / Engineer / Consultant Engineer	Company or legal person providing services for the Investor Technical Assistance Consultant for the OVFMP Project – AECOM Polska Sp. z o.o.
Contract / Contract 3A.6 / Works Contract / Works Contract 3A.6	Works Contract 3A.6 <i>Construction of a pumping station for mobile pumps to drain the Lesisko complex</i>
Contractor	Company or a legal person implementing the Works Contract 3A.6
Designer	Company or a legal person drawing up the design documentation
DQAP / SPZJ	Detailed Quality Assurance Plan
EHS Guidelines	World Bank Group Environmental, Health, and Safety Guidelines https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/EHS-Guidelines/
EIA	Environment Impact Assessment
EMP	Environmental Management Plan
Environmental Decision (ED)	Decision on environmental conditions
Epidemic risk state	Legal situation introduced in a given area in connection with the risk of occurrence of an epidemic, in order to undertake anti-epidemic actions as specified in the Act on combating infectious diseases
Epidemic state	Legal situation introduced in a given area in connection with the occurrence of an epidemic, in order to undertake anti-epidemic and preventive actions to minimize the effects of an epidemic as specified in the Act on combating infectious diseases

Name	Description
ES	The Environmental and Social World Bank Policy – ES, concerning environmental and social issues (i.e. in the scope of the environmental protection, health and safety at work and of the social issues, including gender equality, protection of minors, protection of particularly vulnerable people (including the disabled), sexual harassment, sexual violence, awareness and prevention of HIV/AIDS)
ESMF	Environmental and Social Management Framework http://odrapcu.pl/doc/OVFMP/Environmental_and_Social_Management.pdf
GDOŚ	General Directorate for Environmental Protection
H&S	Health and Safety
IMGW-PIB	Institute of Meteorology and Water Management National Research Institute
KZGW	National Water Management Authority
LA&RAP	Land Acquisition and Resettlement Action Plan
LSDP / MPZP	Local Spatial Development Plan
MGR	Major Groundwater Reservoirs
MZMiUW	Małopolski Board of Amelioration and Hydraulic Structures in Cracow
PAD	Project Appraisal Document for the World Bank approval of a Loan to the Polish Government to implement OVFMP http://documents.worldbank.org/curated/en/320251467986305800/Poland-Odra-Vistula-Flood-Management-Project
PCU / OVFM PCU	Odra-Vistula Flood Management Project Coordination Unit http://odrapcu2019.odrapcu.pl/en/welcome/
PGW WP	State Water Holding Polish Waters
PIO	Project Implementation Office – created within PIU separate organizational unit responsible for the implementation of Works Contract
PIU / OVFM PIU	OVFM Project Implementation Unit
PIU / Investor / Employer (to December 31, 2017)	Małopolski Board of Amelioration and Hydraulic Structures in Cracow
PIU / Investor / Employer (from January 1, 2018)	State Water Holding Polish Waters, represented by the Director of Regional Water Management Authority in Cracow / OVFM Project Implementation Unit

Name	Description
POM	Project Operations Manual prepared by the Odra Vistula Flood Management Project Coordination Unit, Wroclaw 2015 http://www.odrapcu.pl/doc/POM_PL.pdf the binding version is the English one: http://www.odrapcu.pl/doc/POM_ENG.pdf
Project / OVFMP / OVFM Project	Odra-Vistula Flood Management Project
RDOŚ	Regional Directorate for Environmental Protection
Roads authority	Agency responsible for management of public roads in accordance with the Act on public roads
RZGW	Regional Water Management Authority
SCDSP / SUIKZP	Study of Conditions and Directions of Spatial Development
Waste MP	Waste Management Plan
WIOŚ	Provincial Inspectorate for Environmental Protection
World Bank (WB)	International Bank for Reconstruction and Development http://www.worldbank.org/

LIST OF ABBREVIATED TITLES OF LEGAL ACTS APPLIED IN THIS EMP

Titles, publication reference and abbreviated titles of legal acts quoted within contents of this EMP are given in the table below.

Abbreviated title	Full title (with publication reference)
<i>APC</i>	The Act of June 14, 1960 Code of Administrative Procedure (consolidated text: Journal of Laws of 2020, item 256 as amended)
<i>CC</i>	The Act of April 23, 1964 Civil Code (consolidated text: OJ of 2019, item no. 1145 as amended)
<i>LC</i>	The Act of June 26, 1974 Labour Code (consolidated text: OJ of 2020, item no. 1320)
<i>PC</i>	The Act of June 6, 1997 Penal Code (consolidated text: OJ of 2020, item no. 1444)
<i>BIOZ Regulation</i>	Regulation of the Minister of Infrastructure of June 23, 2003 on Information Concerning Safety and Health Protection and Safety and Health Protection Plan (Journal of Laws of 2003, No.120, item 1126)
<i>Noise level Regulation</i>	Regulation of the Minister of Environment of June 14, 2007 on admissible noise levels in the environment (OJ of 2014, item no. 112)
<i>Regulation on the protection of fungi species</i>	Regulation of the Minister of Environment of October 9, 2014 on the protection of fungi species (OJ of 2014, item no. 1408)
<i>Regulation on the protection of plant species</i>	Regulation of the Minister of Environment of October 9, 2014 on the protection of plant species (OJ of 2014, item no. 1409)
<i>Regulation on the protection of animal species</i>	Regulation of the Minister of Environment of December 16, 2016 on the protection of animal species (OJ of 2016, item no. 2183 as amended)
<i>Regulation on works prohibited for juveniles</i>	Regulation of the Council of Ministers of August 24, 2004 on the list of prohibited work for juveniles and the conditions for their employment in some of these works (consolidated text: OJ of 2016, item no. 1509)
<i>EIA Regulation</i>	Regulation of the Council of Ministers of September 10, 2019 on the investment that may significantly affect the environment (consolidated text: OJ of 2019, item no. 1839)
<i>Water MP</i>	Regulation of the Council of Ministers of October 18, 2016 on Water Management Plan for waters within the Vistula River Basin (Journal of Laws 2016, item 1911)
<i>Act on public roads</i>	The Act of March 21, 1985 on the public roads (consolidated text: OJ of 2020, item no. 470 as amended)

Abbreviated title	Full title (with publication reference)
<i>EPI Act</i>	The Act of July 20, 1991 on the Environmental Protection Inspectorate (consolidated text: OJ of 2020, item no. 995 as amended)
<i>Waste Act</i>	The Act of December 14, 2012 on the waste (consolidated text: OJ of 2020, item no. 797 as amended)
<i>EIA Act</i>	Act of October 3, 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments (consolidated text, Journal of Laws of 2020, item 283, as amended)
<i>NP Act</i>	Act of April 16, 2004 on the nature protection (consolidated text, Journal of Laws of 2020, item 55 as amended)
<i>Act on combating infectious diseases</i>	The Act of December 5, 2008 on preventing and combating infections and infectious diseases in humans (consolidated text: OJ of 2019, item no. 1239 as amended)
<i>Act on heritage protection</i>	The Act of July 23, 2003 on the protection of heritage and on the care for heritage (consolidated text: OJ of 2020, item no. 282 as amended)
<i>SLI Act</i>	The Act of April 13, 2007 on the State Labour Inspectorate (consolidated text: OJ of 2019, item no. 1251)
<i>SSI Act</i>	The Act of March 14, 1985 on the State Sanitary Inspectorate (consolidated text: OJ of 2019, item no. 59 as amended)
<i>EPL Act</i>	The Act of April 27, 2001 Environmental Protection Law (consolidated text: OJ of 2020, item no. 1219 as amended)
<i>Building Law Act</i>	Act of July 7, 1994, Construction Law (consolidated text: Journal of Laws of 2020, item 1333)
<i>Water Law Act</i>	The Act of July 20, 2017 Water Law (consolidated text: OJ of 2020, item no. 310 as amended)
<i>Equal Treatment Act</i>	The Act of December 3, 2010 on implementation of some regulation of the European Union in reference to equal treatment (consolidated text: OJ of 2016, item no. 1219 as amended)
<i>Damage Act</i>	The Act of April 13, 2007 on preventing damages to the environment and their removal (consolidated text: OJ of 2019, item no. 1862 as amended)

Summary

This Environmental Management Plan (EMP) refers to Works Contract 3A.6
Construction of a pumping station for mobile pumps to drain the Lesisko complex.

Contract 3A.6 remains a part of Subcomponent 3A implemented within *Odra-Vistula Flood Management Project* (OVFMP), co-financed by the International Bank for Reconstruction and Development (World Bank), and by the Council of Europe Development Bank, European Union Cohesion Fund, and by the State Budget.

This EMP includes the following elements:

- Brief description of the OVFM Project (Chapter 1.1);
- Description of Works Contract 3A.6, to which this EMP refers to (Chapter 2);
- Institutional, legal and administrative conditions for implementation of the aforementioned Contract with specified binding state legal acts on environmental protection, main stages of the EIA procedure, and also the current course of EIA procedure for the aforementioned Contract (Chapter 3);
- Description of individual elements of the environment in the area of the aforementioned Contract (Chapter 4);
- Summary of the environmental impact assessment (Chapter 5);
- Description of mitigation measures to eliminate or limit the adverse impact of the aforementioned Contract on the environment (Chapter 6), including a tabulated summary of those measures (Appendix 1 – Plan of mitigation measures);
- Description of environmental monitoring measures for the aforementioned Contract (Chapter 7), including a tabulated summary of those measures (Appendix 2 – Plan of monitoring measures);
- Description of the course of public consultations on particular stages of environmental documentation development for the aforementioned Contract (Chapter 8);
- Description of the organizational structure for implementation of the EMP (Chapter 9);
- Implementation schedule and description of reporting procedures (Chapter 10).

Appendices to this EMP include: a tabulated summary for the plan of mitigation measures (Appendix 1) and for the plan of monitoring measures (Appendix 2), the list of national legal acts related to environmental protection (Appendix 3), copies of decisions, resolutions, permits and / or notes referring to the environmental protection (Appendix 4) and graphical appendices, including: a map presenting location of the Contract (Appendix 5), a map with location of the Contract in reference to protected areas (Appendix 6), a map with location of the Contract in reference to areas under potential flood threat (Appendix 7), a map with location of the Contract in reference to areas excluded from the potential flood threat (Appendix 8), a map presenting location of the Contract in reference to natural habitats and protected species occurrence sites (Appendix 9), and a map with location of the Contracts' elements (Appendix 10).

Characteristics of the Works Contract

The Works Contract 3A.6 concerns construction of a pumping station for mobile pumps to drain the Lesisko Complex, along with technically and functionally related facilities. The Contract will be executed in Małopolskie Province, within the District of the City of Cracow, in the Municipality of Cracow.

Scope of the Works Contract

The scope of Works Contract 3A.6 comprises the following elements:

- construction of a pumping station for mobile pumps at chainage km 0+183-0+238 of the Lesisko Channel (with a maneuvering yard and a site flood storage reservoir);
- demolition of the existing lock and construction of a new one at the Lesisko Channel (at chainage km 0+142-0+187 of the channel);
- protection of the inlet and of the outlet of the embankment lock at the Lesisko Channel;
- construction of slope stairs for the lock and for the pumping station;
- redevelopment of infrastructural elements, including the following: municipal water-piping, ground-based teletechnical line, access road with a descend road to the pumping station;
- redevelopment of a section of the Lesisko Channel (over a length of about 540 m), upstream of the pumping station;
- increasing the area of the existing water reservoir at the Lesisko Channel (in the upper section of the channel);
- development of a temporary cofferdam for the purpose of developing a new embankment lock.

Need to implement the Works Contracts

The implementation of Works Contract 3A.6 results from the necessary improvement of flood protection of developed areas on the left bank of the Vistula River within the borders of the city of Cracow and the reduction of flood losses in the above-mentioned areas by improving flood protection on the left bank of the Vistula River upstream of the Wandy bridge in Cracow (within the catchment of the Lesisko Channel). The purpose of the planned investment is to allow for active transfer of rainfall water (through mobile pumps) from the Lesisko Channel to the River Vistula, when the water level in Vistula is higher than the regular one or when the water flow in the Lesisko Channel exceeds the capacity of the embankment lock at the gravitational discharge. The Works Contract 3A.6 is a functional complement to the proposed Works Contract 3A.1/1¹, ensuring the flood protection of urban areas located on the left bank of the Vistula River upstream and downstream of the Wandy bridge in Cracow.

The works in question have been included under item “ID 1_651_W” (ordinal number: 760) on List no. 1 in Appendix no. 2 titled “*Investments that do not affect reaching the good status of water adversely or that do not deteriorate the status of water*” to the MasterPlan for the Vistula river-basin (2014)².

¹ Works Contract 3A.1/1 *Modernization of Vistula embankments in Cracow – Section 1, Section 2*, concerning the extension of the left-bank flood embankment of the Vistula River from the Wandy bridge to Suchy Jar.

² See: description in the footnote in Chapter 1.

Institutional, legal, and administrative conditions

Works Contract 3A.6 is implemented in accordance with relevant state regulations on the environmental protection and in conformity with proper policies of the World Bank, while considering its characteristics, expected potential impact on the environment, and location in reference to the protected sites.

Status of administrative procedures for the EIA

In case of the Works Contract in question, in year 2020 the following administrative decisions in the scope of environmental protection have been issued:

- Decision of the Regional Director for Environmental Protection in Cracow dated July 27, 2020 on environmental conditions (ref. no.: OO.420.4.4.2019.BM – Appendix 4a to this EMP).
- Resolution of the Regional Director for Environmental Protection in Cracow dated August 06, 2020 on correction of obvious editorial mistakes in contents of the environmental decision dated July 27, 2020 (ref. no.: OO.4220.5.31.2020.BM – Appendix 4b to this EMP).

Current condition of the environment surrounding the Works Contract

As a result of works done to identify values of the natural and cultural environment, it has been identified that the implementation area for Works Contract 3A.6 and its neighborhood are characterized by the following environmental conditions:

- Implementation area for the aforementioned Works Contract is located within the boundaries of one Body of Surface Water (BSW), i.e. PLRW2000192137759 *Wisła od Skawinki do Podłężanki*, and also within the boundaries of one Body of Groundwater (BGW), with code PLGW2000131.
- Within the implementation area for the aforementioned Works Contract and in its close vicinity there are no Natura 2000 sites or other areas and objects under protection based upon the Act on the Nature Protection.
- One type of natural habitat (willow riparian forest) has been found within the Contract implementation area and in its close vicinity.
- Within the implementation area for the aforementioned Works Contract and in its close vicinity no protected species of plants and fungi were identified.
- Within the implementation area for the aforementioned Works Contract and in its close vicinity it was found that 2 common species of protected invertebrates, 5 protected species of fish, 8 common protected species of amphibians and reptiles, ca. 30 protected species of birds, several protected species of bats and 3 protected species of non-flying mammals occur or may occur.
- No heritage protected based upon regulations on the protection of heritage and on the care for heritage is present within the implementation area for the aforementioned Works Contract nor in its close vicinity.

Summary of the environmental impact assessment

Impact on land surface and landscape

Implementation of the planned Works Contract is associated with acquisition of land and with local logging of trees and shrubs, but those do not affect land surface and landscape adversely.

Impact on climate

Implementation of the planned Works Contract does not affect the condition of climate.

Impact on the quality of air

Impact of the planned Works Contract on the quality of air is limited in time to the construction stage and it is not significant.

Impact on soils and grounds

Implementation of the planned Works Contract is associated with a permanent transformation of land surface (including soils and grounds) for the development of particular hydro-technical facilities, as well as with a potential possibility of contamination of the subbase on the construction stage. At the operational stage, constructed hydrotechnical facilities shall not affect the condition of soils and grounds. If the conditions determined in Appendix 1 to this EMP would be met properly, the performance would not affect the condition of soils and grounds adversely.

Impact on surface water and groundwater

The planned reconstruction and construction of hydrotechnical facilities at the Lesisko Channel shall not affect the morphological continuity of the channel, and shall also not affect water's hydromorphological, biological, and physical-chemical elements adversely. The performance is associated with a potential possibility of contaminating surface water and / or groundwater on the construction stage. At the operational stage, the operation of the constructed hydrotechnical facilities shall not affect the condition of surface water and groundwater adversely. If the conditions determined in Appendix 1 to this EMP would be met properly, the performance would not affect the condition of surface water and groundwater adversely.

Impact on acoustic climate

Impact of the planned Works Contract on the acoustic climate is limited in time to the construction stage, and it is not significant.

Impact on biotic nature

Implementation of the planned Works Contract is associated with the occurrence of local impacts on vegetation and on fauna in the area. Those impacts – resulting mainly from the necessary acquisition of land, traffic of vehicles and machines in the construction period, and logging of trees and shrubs – shall be partially reduced due to the planned mitigation measures (including e.g.: replacement planting of trees and shrubs), and in total they shall not have a significant negative impact on the state of resources of protected habitats and species, neither on a local nor regional scale. Implementation of the planned Works Contract does not affect Natura 2000 sites or other protected areas.

Impact on cultural heritage and material goods

Implementation of the planned Works Contract does neither affect cultural heritage nor material goods adversely. The operational stage is associated with a positive impact on material goods, by improving the flood safety of areas located on the left bank of the Vistula, within catchment of the Lesisko Channel.

Impact on health and safety of people

The Works Contract does not generate significant hazards to health and safety of people. They may emerge only in case of a failure, catastrophes, or other random events (such as e.g. leakage of pollutions, fire, finding of unexploded shells and misfires, flood). The EMP determines relevant conditions for prevention of such events and for mitigation of their potential effects. The operational stage is associated with a positive impact on health and safety of people, by improving the flood safety of areas located on the left bank of the Vistula, within catchment of the Lesisko Channel.

Other ES hazards

Regardless of the ones listed above, other ES related types of issues or hazards as accidents and near misses, cases of sexual harassment or mobbing, cases of labour law violation, cases of sexually transmitted diseases (including HIV/AIDS) or other infectious diseases (including those caused by coronaviruses, e.g. COVID-19), and others, may occur during implementation of the Works Contract. This EMP determines relevant conditions to prevent hazards of those types and to efficiently react to the cases of their occurrence.

Mitigation measures and monitoring measures

Chapters 6 and 7 of and Appendixes 1 and 2 to this EMP described and present – in a tabular form – a set of mitigation measures and monitoring measures to eliminate or limit adverse impact of the planned Works Contract on the environment, and to assure efficient implementation of the EMP's conditions. Those measures contain conditions determined in the binding decision on environmental conditions, as well as additional conditions provided on the stage of works on the EMP.

Public consultations

Chapter 8 of the EMP provides a relation of public consultations held under the EIA procedure for the planned Works Contract, including the following:

- Public consultations on the document titled *Environmental and Social Management Framework (ESMF)* for the OVFMP Project (2015).
- Public consultations held on the stage of issuing the environmental decision for the assignment comprising the planned Works Contract (2019-2020).
- Public consultations for this Environmental Management Plan (2020).

1 Introduction

This study presents the Environmental Management Plan (EMP) for the Works Contract 3A.6 *Construction of a pumping station for mobile pumps to drain the Lesisko complex*.

Contract 3A.6 remains a part of Subcomponent 3A implemented within *Odra-Vistula Flood Management Project (OVFMP)*, co-financed by the International Bank for Reconstruction and Development (World Bank), the Council of Europe Development Bank, by the European Union Cohesion Fund, and by the State Budget.

In reference to the environmental screening described in the Environmental and Social Management Framework for the OVFMP Project, the works in question have been included under item “ID 1_651_W” (ordinal number: 760) on List no. 1 in Appendix no. 2 titled “*Investments that do not affect reaching the good status of water adversely or that do not deteriorate the status of water*” to the MasterPlan for the Vistula river-basin (2014)³.

1.1 Odra-Vistula Flood Management Project

The main objective of the OVFMP Project is to protect people in flood plains within selected parts of river-basins of two of the greatest Polish Rivers – Vistula and Odra – against hazards caused by extreme floods. Implementation of the most urgent flood protection assignments was forecasted within the framework of the OVFMP.

The OVFMP Project consists of the following 5 Components:

- Component 1 – Flood Protection of the Middle and Lower Odra;
- Component 2 – Flood Protection of the Nysa Kłodzka Valley;
- Component 3 – Flood Protection of the Upper Vistula;
- Component 4 – Institutional Strengthening and Enhanced Forecasting;
- Component 5 – Project Management and Studies.

Component 3 is divided into the following Subcomponents:

- Subcomponent 3A – Flood Protection of Upper Vistula towns and Cracow;
- Subcomponent 3B – Protection of Sandomierz and Tarnobrzeg;
- Subcomponent 3C – Passive and Active Protection in Raba Sub-basin;
- Subcomponent 3D – Passive and Active Protection in San Basin.

³ The MasterPlans for the Vistula River Basin and for the Odra River Basin remain a result of establishments made with the European Committee, which led to implementation of “*Action Plan for Strategic Planning in Water Management*” by Poland (resolution of the Council of Ministers of July 2, 2013, ref. no.: 118/2013).

The MasterPlans remained an update to water management plans, since their previous update in 2015, and subsequently their results – in terms of investments, which affect or which may affect the status of water bodies – were transferred to the updated water management plans (adopted by the resolution of the Council of Ministers of October 18, 2016).

Detailed information on the Project may also be found in the Environmental and Social Management Framework published at e.g. websites of the World Bank⁴ and of the Odra-Vistula Flood Management Project Coordination Unit⁵. A detailed description of the Project is also given in PAD⁶ and in the Project Operations Manual⁷.

⁴ <http://documents.worldbank.org/curated/en/717671468333613779/Poland-Odra-Vistula-Flood-Management-Project-environmental-and-social-management-framework>

⁵ http://odrapcu2019.odrapcu.pl/en/popdow_about_project/

⁶ <http://documents.worldbank.org/curated/en/320251467986305800/Poland-Odra-Vistula-Flood-Management-Project>

⁷ http://www.odrapcu.pl/doc/POM_PL.pdf

(a binding English version is available at: <http://www.odrapcu.pl/doc/POM/ENG.pdf>)

2 Contract Description

The Works Contract 3A.6 refers to construction of a pumping station for mobile pumps to drain the Lesisko Complex, along with technically and functionally related facilities (e.g.: flood storage reservoir, embankment lock, access road and maneuvering yard, redevelopment of a section of the Lesisko Channel, extension of the reservoir at the Lesisko Channel). The purpose of the planned investment is to allow for active transfer of rainfall water through mobile pumps from the Lesisko Channel to the River Vistula at increased water level (disabling gravitational discharge of water to the river from the catchment) or when the water flow in the Lesisko Channel exceeds the capacity of the embankment lock at the gravitational discharge.

The Works Contract 3A.6 is a functional complement to the proposed Works Contract 3A.1/1⁸, ensuring the flood protection of urban areas located on the left bank of the Vistula River upstream and downstream of the Wandy bridge in Cracow. Together with other elements of Subcomponent 3A of the OVFMP Project (implemented or planned to be implemented under Contracts 3A.5⁹, as well as 3A.3¹⁰, 3A.4¹¹, 3A.1/2¹² and 3A.2¹³), the planned projects will provide comprehensive protection of the areas located on the left and right bank of the Vistula in Cracow against flooding.

The Project Implementation Unit (PIU) for the Contract is the State Water Holding Polish Waters, represented by the Director of Regional Water Management Authority in Cracow with its office at 22. Marszałka J. Piłsudskiego Street, 31-109 Cracow.

According to the valid bidding documents, the planned Contract's implementation time is at least 13 months.

⁸ Works Contract 3A.1/1 *Modernization of Vistula embankments in Cracow – Section 1, Section 2*, concerning the extension of the left-bank flood embankment of the Vistula River from the Wandy bridge to Suchy Jar.

⁹ Works Contract 3A.5 *Development of a flood gate at the left flood embankment in the area of water intakes for the Sendzimir Steel Mill in Cracow*, concerning the construction of a flood gate on the inlet channel to the Kujawy port on the left bank of the Vistula.

¹⁰ Works Contract 3A.3 *Section 4 - Right embankment of the Vistula from the Skawinka estuary to the Kościuszko barrage*, concerning the extension of the right-bank flood embankment of the Vistula River upstream of the Kościuszko barrage.

¹¹ Works Contract 3A.4 *Extension of a section of the right embankment downstream of the Dąbie Barrage, including development of a flood gate in the area of a repair yard*, concerning the extension of the flood embankment on the right bank of the Vistula from the Dąbie barrage to the Płaszów port and construction of a flood gate in the Płaszów port.

¹² Works Contract 3A.1/2 *Modernization of Vistula embankments in Cracow – Section 3*, concerning the extension of the right-bank flood embankment of the Vistula River from the Płaszów port to the Przewóz barrage.

¹³ Contract 3A.2 *Flood protection in Serafa valley*, concerning the construction of four dry small retention reservoirs on the Malinówka stream and the Serafa river.

2.1 Location of the Works Contract

The planned Works Contract 3A.6 is located in Poland, Małopolskie Province, in the area of the City of Cracow (District of the City of Cracow, Municipality of Cracow).

The area of the planned construction of the flood gate is located in the eastern part of the area covered by the administrative borders of the city of Cracow (within approx. 7-8 km east of the Old Town Square and approx. 1.5-2 km south-east of the Central Square in the Nowa Huta District), in the area limited by the Vistula riverbed (from the south), Klasztorna Street (from the east), Odmętowa Street (from the north and north-west) and Longinusa Podbiپیęty Street (from the south-west).

Location of the Works Contract 3A.6 has been presented on the drawing presented below (Fig. 1) and in Appendix 5 to this EMP – Map with location of the Contract.

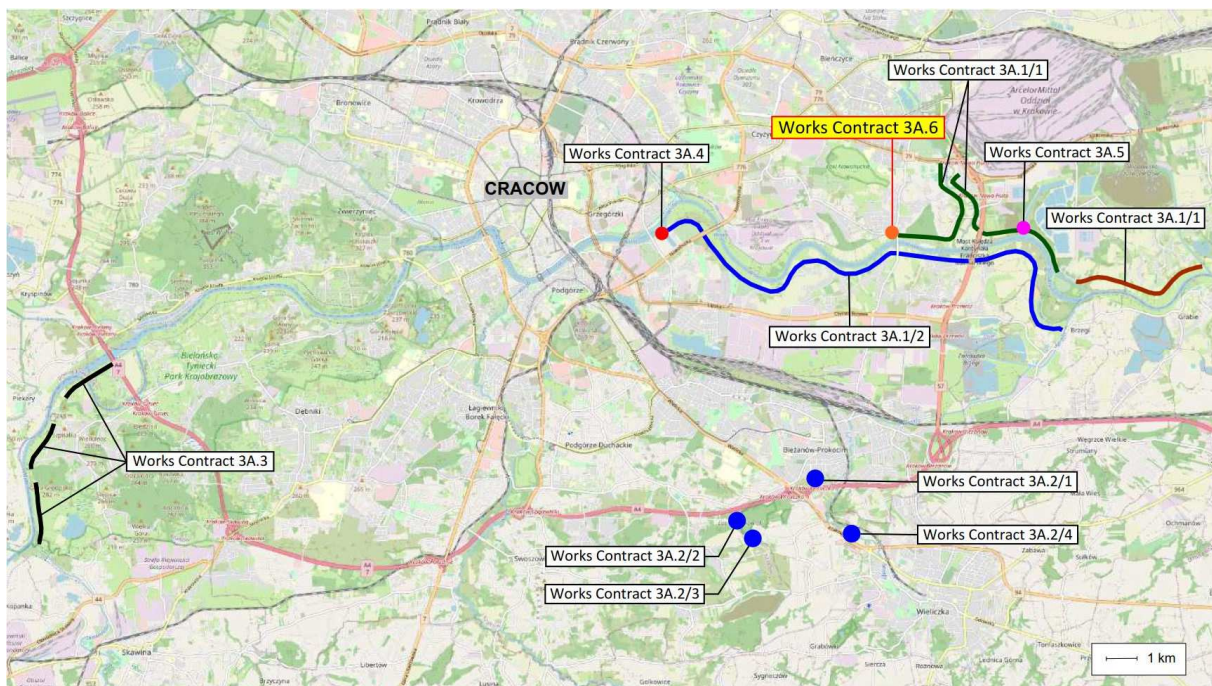


Fig. 1. Location of the Works Contract 3A.6 together with the location of other Works Contracts of Subcomponent 3A of the OVFMP (source: own materials)

2.2 Specificity of the Works Contract

The scope of Works Contract 3A.6 comprises the following elements¹⁴:

- construction of a pumping station for mobile pumps at chainage km 0+183-0+238 of the Lesisko Channel (with a maneuvering yard and a site flood storage reservoir).

The basic parameters of the proposed objects are presented below:

- area of the pumping station – approx. 535 m²
 - course of the pumping station – open-work road slabs
 - area of the maneuvering yard – approx. 260 m²
 - course of the maneuvering yard – breakstone
 - area of the flood storage reservoir – approx. 800 m²
 - capacity of the flood storage reservoir – approx. 600 m³
 - elevation of the flood storage reservoir's bottom – approx. 196.18 m a.s.l.
 - gradient of the flood storage reservoir's slopes – 1:2
 - protection of slopes and of the bottom of the flood storage reservoir and of slopes and of the bottom of the Lesisko Channel along the reservoir – grate-type open-work slabs
 - maximum number of mobile pumps that may operate at the pumping station – 6 units
 - total capacity of the pumping system (at operation of 6 mobile diesel pumps) – 1.51 m³/s
- demolition of the existing lock (made of reinforced-concrete tubes with a diameter of 0.8 m) and construction of a new embankment lock (made of plastic tubes with a diameter of 1.5 m) at the Lesisko Channel, at chainage km 0+142-0+187 of the channel. The new embankment lock shall comprise a main duct of the lock, an inlet chamber (with non-return valve, discharge flange with non-return valve, 6 connections for mobile pumps with non-return valves, grates and gate valves), and reinforced-concrete abutments at the inlet and at the outlet.

The basic parameters of the proposed objects are presented below:

- length of the lock's main duct tube – 42.5 m
- diameter of the lock's main duct tube – 1.5 m
- elevation of the bottom of the inlet to the lock's main duct tube – 195.36 m a.s.l.
- elevation of the bottom of the outlet from the lock's main duct tube – 195.15 m a.s.l.
- elevation of the inlet chamber's bottom – 195.36 m a.s.l.

¹⁴ The characteristics of the Works Contract provided in this EMP are for reference only and do not replace the design documentation. The Contractor is obliged to perform the works in accordance with the design documentation and with Technical Specifications corresponding with particular branches.

- protection of the inlet and of the outlet at the embankment lock at the Lesisko Channel
(protection type: concrete slabs at the bottom and on slopes of the inlet and of the outlet, gradient of 1:2, at full height of slopes, ended with reinforced-concrete buttresses);
- construction of slope stairs for the lock and for the pumping station for traffic purposes (8 units in total);
- redevelopment of infrastructural elements, including the following:
 - municipal water-piping – modification of elevation for placement of the water-piping running over the embankment lock over a length of about 22.5 m,
 - ground-based teletechnical line – change of the ground-based line (on posts) to underground line over a length of about 90 m,
 - access road with an asphalt course (over a length of about 50 m), with a descend road to the pumping station.
- redevelopment of a section of the Lesisko Channel upstream of the pumping station (at chainage km 0+238-0+781) through partial desilting of the bottom, with profiling and reinforcement of the channels slopes.

The basic parameters of the proposed objects are presented below:

- length of channel section to be redeveloped – approx. 540 m
 - width of the channel at the bottom – 2.2 m
 - gradient of the channel bottom – 0.05%
 - gradient of channel slopes – 1:1.5
 - protection for the channel slopes' bases – fascine bundles and fences, with wooden palisade at top end of the section
- increasing the area of the existing water reservoir in the upper section of the Lesisko Channel (at chainage km 0+935-1+327 of the channel), including the following:
 - extension of the bank zone on the left bank of the reservoir by about 0.18 ha,
 - extension of the bank zone on the left bank of the reservoir by about 0.75 ha.

Extension of the existing flow-through reservoir's bowl at the Lesisko Channel shall comprise its widening (over a length of about 400 m) to the average width of about 50 m, while adapting to the existing ground and at keeping the existing depth of about 1.8 m. The works shall not relate to the remaining part of the existing reservoir's bottom, which would be left intact. The new bank slopes (with gradient of 1:2) shall be top-soiled and sown with a mix of grass. As a result of the works to be done the reservoir's area shall raise from about 1.0 ha to about 1.9 ha.

- development of a temporary cofferdam protecting the site for development of the new embankment lock from the side of Vistula's embanked area (for the purpose of performing drilling at base of the embankment, and constructing an abutment of the lock's outlet at the riverside of the embankment), and protecting the area beyond the embankment against flooding at bankful discharge in the River Vistula during the performance.

The location of components of Works Contract 3A.6 is shown in the map in Appendix 10 to this EMP – Map with location of the Contract's elements.

According to the current estimates, the volume of soil necessary for implementation of the Works Contract 3A.6 is about 1 K m³. The above-mentioned ground masses will be obtained from the building excavation done within the Contract implementation area (after performing appropriate tests confirming their usefulness for the purposes of the Contract), and in case of material shortage the missing part will be purchased and delivered from licensed external sources proposed by the Contractor and accepted by the Engineer (in compliance with the conditions for protection of environment, protection of material goods and protection of health and safety of people set out in Appendix 1 to the EMP).

3 Institutional, legal and administrative conditions

3.1 Institutions involved in implementation of the Contract

The investor for the Contract is the State Water Holding Polish Waters in Warsaw, represented by the Director of the Regional Water Management Authority in Cracow (PGW WP RZGW in Cracow).

Additionally, on the stage of performance and of operation, implementation of the Contract may require involvement of public administration units on central, regional, and local levels. An ongoing coordination of the OVFMP Project implementation by particular PIUs is the task of the OVFMP Project Coordination Unit (see Chapter 9.1).

3.2 Binding Polish law acts with regard to the environment

In accordance with the Polish Law the investment process related to the environmental protection remains a subject of several acts and regulations. A summary of selected, basic legal acts in that scope, which are binding for works on the EMP, has been presented in Appendix 3 to this EMP – List of national legal acts related to environmental protection. The number and contents of legal acts given there may be modified along with adjustments to environmental protection provisions valid in the territory of Poland. The Contractor is obliged – except for application of rules determined under this EMP – to apply valid provisions of the state law in the scope of environmental protection.

3.3 EIA procedure in Poland

The description of the environmental impact assessment procedure in Polish legislation is included in the *Environmental and Social Management Framework* (ESMF) published on the i.a. web pages of the World Bank (WB)¹⁵ and the Odra-Vistula Flood Management Project Coordination Unit¹⁶. Furthermore, in case of the EIA procedure legal regulations listed in Appendix 3 to this EMP – List of national legal acts related to environmental protection – are in force.

3.4 Guidelines of the World Bank

The Contract in question shall be co-funded by e.g. the International Bank for Reconstruction and Development (World Bank). As a consequence, the conditions for its implementation in the scope of environmental protection shall correspond with Operational Policies and Bank Procedures in the range of environmental protection, including the following policies and procedures, e.g.: *OP/BP 4.01* (on environmental impact assessment), *OP/BP 4.04* (on environmental habitats), and *OP/BP 4.11* (on cultural resources). A description of the aforementioned World Bank Policies is given in the *Environmental and Social Management Framework (ESMF)*, as published e.g. at websites of the World Bank¹⁵ and of the Odra-Vistula

¹⁵ At: <http://documents.worldbank.org/curated/en/717671468333613779/Poland-Odra-Vistula-Flood-Management-Project-environmental-and-social-management-framework>

¹⁶ At: http://odrapcu2019.odrapcu.pl/en/popdow_documents/

Flood Management Project Coordination Unit¹⁶. Original contents of the aforementioned policies and procedures may be found at websites of the World Bank¹⁷.

3.5 The current condition of EIA procedure for the Works Contract 3A.6

In accordance with a classification given in the EIA Regulation, the assignment forming the subject of Contract 3A.6 is qualified to the group of assignments, which may potentially significantly affect the environment (so-called Group II – Article 3 (1) item 65 of the EIA Regulation), for which, prior to issuing a decision on environmental conditions, it may be required to conduct an environmental impact assessment.

A proceeding on the issuance of a decision on environmental conditions, conducted between November 2019 and July 2020, has been completed with the issuance of a decision by the Regional Director for Environmental Protection in Cracow dated July 27, 2020 on environmental conditions (ref. no.: OO.420.4.4.2019.BM – Appendix 4a to this EMP), stating that there is no need to perform an environmental impact assessment and laying down the conditions of environment use at the planning, implementation and operation phase.

In August 2020 a resolution of the Regional Director for Environmental Protection in Cracow dated August, 6 2020 (ref. no.: OO.4220.5.31.2020.BM – Appendix 4b to this EMP) has been issued in reference to correction of editorial mistakes related to elevations of the reservoir's bottom at the Lesisko Channel (the current one and the target one), as given within contents of the decision on environmental conditions dated July 27, 2020 (ref. no.: OO.420.4.4.2019.BM – Appendix 4a to this EMP).

Copies of the above-mentioned decisions are presented in Appendix 4 to this EMP – Decisions, resolutions, permits, notices.

3.6 Grievance redress mechanisms

All project affected persons (PAPs) will have access to adequate and accessible grievance redress mechanisms. Everyone has the right to file a complaint or motion. Filing complaints or motions is not subject to fees. Furthermore, in accordance with the regulations, the person filing a complaint or request may not be exposed to any damage or allegation on account of such submission.

More information on Grievance redress mechanisms employed for projects co-financed from World Bank funds can be found in the Odra-Vistula Flood Management Project Operations Manual (POM) available on the website of the Project Coordination Unit¹⁸.

¹⁷ At: <https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx#S3-2> (in the part titled *Investment Project Financing / Environmental and Social Safeguard Policies*).

¹⁸ At: http://odrapcu2019.odrapcu.pl/doc/POM_ENG.pdf.

4 Description of environmental elements

4.1 Land surface and landscape

According to the physical-geographical regionalization by Kondracki (2001), including following modifications to the aforementioned regionalization, the implementation site for the Works Contract 3A.6 is located within the mesoregion Nadwiślańska Lowland (Fig. 2):

- megaregion: Carpathian Region;
- province: Western Carpathian Mountains with Western and Northern Podkarpacie;
- subprovince: Northern Podkarpacie;
- macroregion: Sandomierska Valley;
- mezoregion: Nadwiślańska Lowland.



Fig. 2. Location of the Works Contract 3A.6 in reference to physical-geographical units (source: own materials)

4.2 Climate

The City of Cracow and its closest vicinity is located at the bottom boundary of a moderately warm climatic level of the Carpathian Mountains, which is a variety of valley climate. It is specified by high diversity of weather conditions resulting mainly from the inflow of various air masses to that area – polar-maritime mainly, and – to a lesser extent – warm within the entire year: tropical-maritime or continental, as well as cold and dry arctic air.

Meteorological conditions for the City of Cracow and its vicinity in 2018 (WIOŚ, Cracow 2018):

- Mean annual temperature: 10.6°C,
- Annual long-term precipitation rate in the area was from 500 mm at Małopolska Upland to 1200-1400 mm in the Carpathian Mountains.

4.3 Air quality

The quality of air within the City of Cracow and in its vicinity may be considered as bad. Acceptable levels determined for suspended particulates PM10 and PM2.5 (daily concentration, as well as alarm levels and mean annual rates) and target levels for benzo(a)pyrene (mean annual concentration) are highly exceeded. Those exceedances also refer to the acceptable level for nitrogen dioxide (mean annual concentration).

The main reason for exceedance – in case of suspended particulates PM10 and PM2.5 and benzo(a)pyrene – is low emission, i.e. emission generated by consumption of coal and its derivatives in individual heating sources, and sometimes of waste by household. Transportation, which is the main source of emission in case of nitrogen oxides and has the biggest share in emission of that pollution, has a smaller contribution in exceedance of the aforementioned substances in the air. Spot sources generally have a smaller impact on the quality of air in Cracow, but locally – in areas located in the industrial impact zone – their share may also raise.

4.4 Soils and grounds

Alluvial soils formed from river deposits are encountered preponderantly in the discussed area located in the region of current and historical floodplains of the Vistula River. Due to its location within the boundaries of the densely populated Cracow agglomeration significant part of those soils was degraded due to development with prevailing residential development.

The soil-agricultural map of Małopolskie¹⁹ Province provides that the areas where the Works Contract 3A.6 is planned to be implemented are classified to the following soil-agricultural complexes: good and very good wheat complex, average greenland, and water waste-land.

The area, where it is expected to locate the investment, is placed – in its bigger part – within a site covered by the Local Spatial Development Plan (LSDP)²⁰ for the City of Cracow: *Resolution no. CXIII/2958/18 of the Cracow City Council of October 10, 2018 on the adoption of the local spatial development plan for the “Mogila II” area* (Fig. 3) and *Resolution no. CXIV/3009/18 of the Cracow City Council of October 24, 2018 on the adoption of the local*

¹⁹ https://miip.geomalopolska.pl/mapa/glebowo_rolnicza.html

²⁰ <https://www.bip.krakow.pl/>

spatial development plan for the “Łąki Nowohuckie” area (Fig. 4). According to provisions under the LSDP, the particular areas located within the project implementation zone and in its immediate vicinity are marked as: WSm – areas of amelioration surface water with a basic purpose for development of ditches and storm channel, WZ – areas of technical facilities, KDZ and KDL – areas of public roads (partially within flood embankments), K – areas of technical facilities, sewerage (with a basic purpose for location of objects and structural facilities related to sewerage infrastructure), ZPm – areas of ordered greenery, with a basic purpose for development of greenery accompanying the ditches and the storm channel, R – agricultural land, with a basic purpose for arable land, Rp – agricultural land, with a basic purpose for meadows and pastures, MN – areas for development of detached-houses.

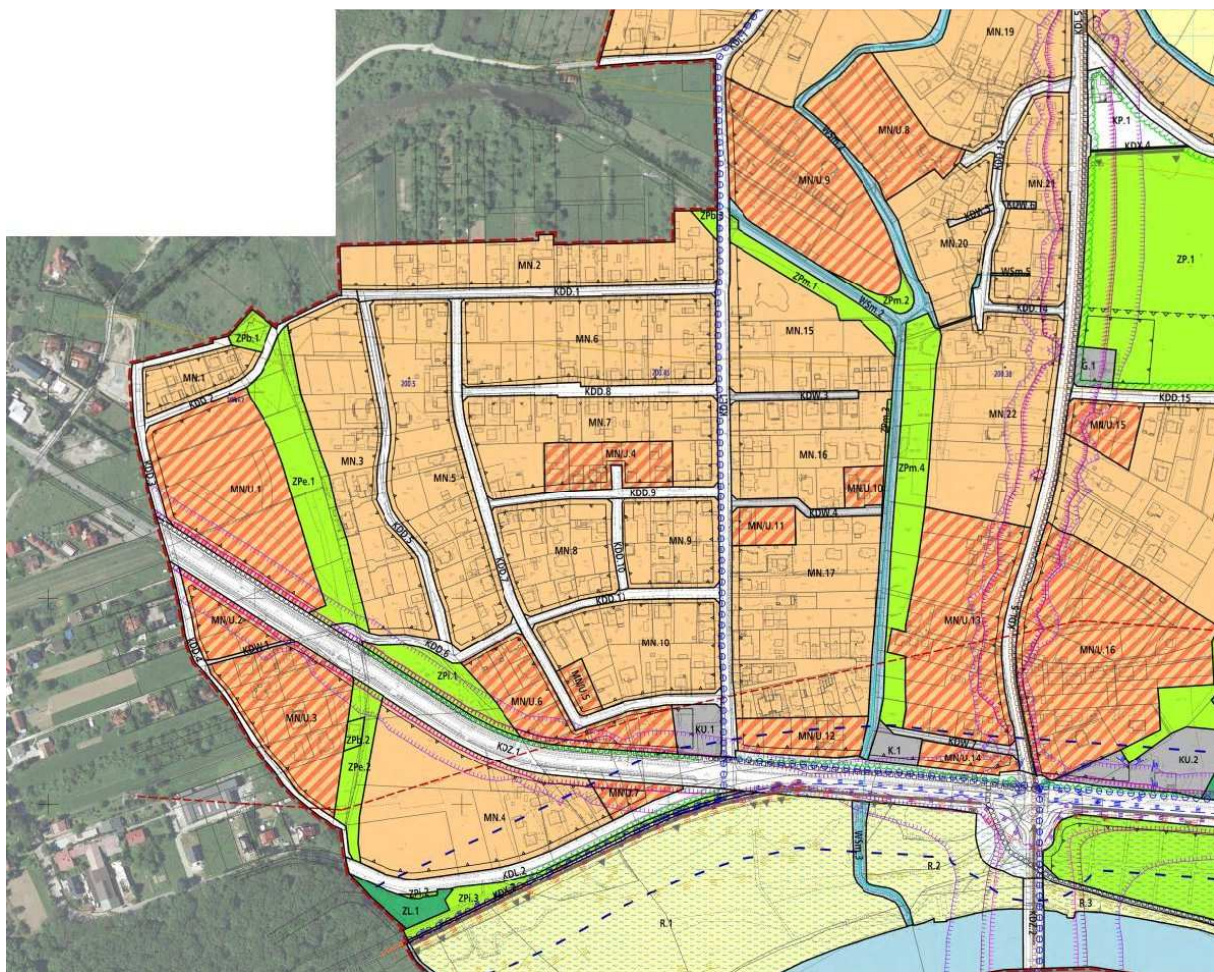


Fig. 3. Designation of the areas in the surrounding of the Works Contract 3A.6 in the *Local Spatial Development Plan (LSDP)*. For explanation of letter symbols, see description in the text of Chapter 4.4. (source: Resolution no. CXIII/2958/18 of the Cracow City Council of October 10, 2018 on the adoption of the local spatial development plan for the “Mogila II” area).

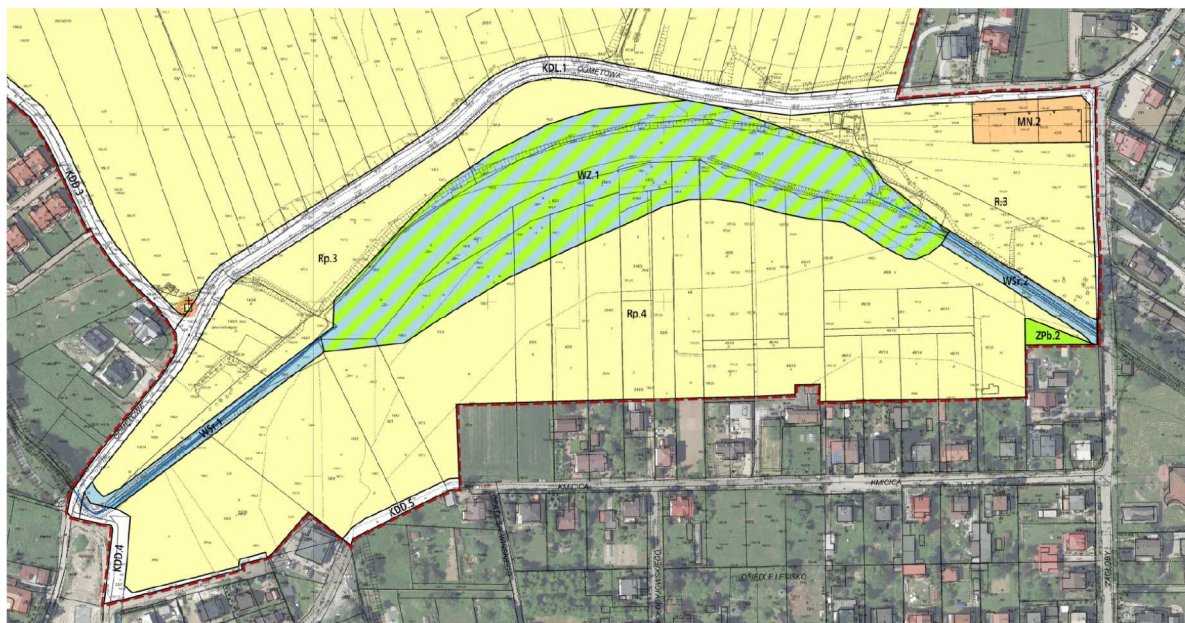


Fig. 4. Designation of the areas in the surrounding of the Works Contract 3A.6 in the *Local Spatial Development Plan (LSDP)*.
For explanation of letter symbols, see description in the text of Chapter 4.4.
(source: *Resolution no. CXIV/3009/18 of the Cracow City Council of October 24, 2018 on the adoption of the local spatial development plan for the “Łąki Nowohuckie” area*).

4.5 Surface water

The Works Contract 3A.6 is located on the left bank of the Vistula River within the administrative boundaries of the city of Cracow, near the 87.7 kilometer of the river course, approx. 100 m upstream from the Wandy bridge and approx. 4.5 km upstream from the Przewóz barrage. The project implementation site encompasses the areas located at 0 to approx. 950 m from the Vistula River bank.

The Vistula River, with a length of 1047 km and a catchment area of 194,424 km², is the longest river in Poland, as well as the longest river flowing into Baltic Sea. The sources of the river are located in southern Poland, at an altitude of 1107 m a.s.l. (Czarna Wisetka) and 1080 m a.s.l. (Biała Wisetka), on the western slope of the Barania Mountain in the Silesian Beskids. The river flows into the Baltic Sea, through the Gdańsk Bay, at a distance of several kilometers east of Gdańsk. The average annual river flow rate in the estuary section is 1046 m³/s.

Hydrological characteristics of the Vistula River in Cracow are presented in the table below:

Designation	Kościuszko barrage	Bielany water gauge	Dąbie barrage	Przewóz barrage
Chainage of Vistula course	63+450	69+280	80+910	92+200
Catchment area [km ²]	7 529	7 634	8 109	8 620
Characteristic flow rates from the period of 1951 to 1980 [m ³ /s]:				
• lowest flow rate (NNQ)	19	19	20	–
• av. low flow rate (SNQ)	30	31	33	–
• av. annual flow rate (SSQ)	92	93	98	–
• av. high flow rate (SWQ)	760	768	790	–
• max. obs. (WW1970)	2 260	2 300	2 350	–
Probable high flow rates from the period of 1931 to 2000 [m ³ /s]:				
• Q _{50%}	570	580	600	630
• Q _{10%}	1 320	1 330	1 370	1 415
• Q _{5%}	1 650	1 660	1 720	1 755
• Q _{2%}	2 070	2 080	2 150	2 190
• Q _{1%}	2 400	2 410	2 480	2 520
• Q _{0.5%}	2 680	2 690	2 760	2 800
• Q _{0.3%}	2 960	2 970	3 040	3 060
• Q _{0.1%}	3 490	3 500	3 560	3 600

Source: Own study based on IMGWM data.

The Lesisko Channel, where the investment in question shall be implemented, remains a left-bank tributary channel of Vistula, which reaches the river approx. 100 m upstream of the Wandy bridge in Cracow. Length of the channel is about 2.5 km, including a section of about 1.5 km within the boundaries of the Contract implementation site (from the beginning of the reservoir along Odmętowa Street in Cracow to the mouth of the channel at Vistula).

The Works Contract 3A.6 is located in the region of the Upper Vistula River of the Vistula River Basin, for which the Water Management Plan was established, adopted with the *Regulation of the Council of Ministers of October 18, 2016 on Water Management Plan for waters within the Vistula River Basin* (OJ of 2016, item no. 1911). The above-mentioned document states that the planned project is located within the Body of Surface Water (BSW) **Wisła od Skawinki do Podłężanki (PLRW2000192137759)**. The said BSW is classified as type no. 19 – a sandy and clayey lowland river, the length of watercourses in the catchment area of BSW is 35.5 km, and the catchment area covers 127.0 km².

BSW *Wisła od Skawinki do Podłężanki* is a highly modified body of water, the condition of which is evaluated as poor. An environmental objective for this BSW is to obtain the good status of waters by achieving the good ecological potential and good chemical status, and also to ensure the possibility of migration of aquatic organisms in the Vistula section within the BSW.

BSW *Wisła od Skawinki do Podłężanki* is at risk of failure to reach the environmental objectives of the Water Framework Directive, hence derogation was determined for it - a less stringent environmental objective was set (for reasons of technical feasibility or disproportionately high costs,) and extension of the date of reaching the environmental objective (until 2021).

Specific environmental objectives also exist on the area of BSW *Wisła od Skawinki do Podłężanki*, established due to the existence of protected areas, such as:

- areas sensitive to eutrophication caused by contaminations coming from municipal sources (the territory of the whole Poland);
- areas designated for the protection of natural habitats or species where the maintenance or improvement of the water status is an important factor in their protection (Natura 2000 sites: *Dębnicko-Tyniecki obszar łąkowy* [PLH120065], *Łąki Nowohuckie* [PLH120069]; Landscape Parks: *Bielańsko-Tyniecki Park Krajobrazowy* [PK3], *Tenczyński Park Krajobrazowy* [PK56]).

The condition of surface waters within the boundaries of the surface water body covering the area of the planned project is monitored on an ongoing basis as part of the state environmental monitoring and its results are published periodically on the websites of the²¹ Chief Inspectorate for Environmental Protection.

Location of the Works Contract in reference to the BSW is given on a figure below (Fig. 5).

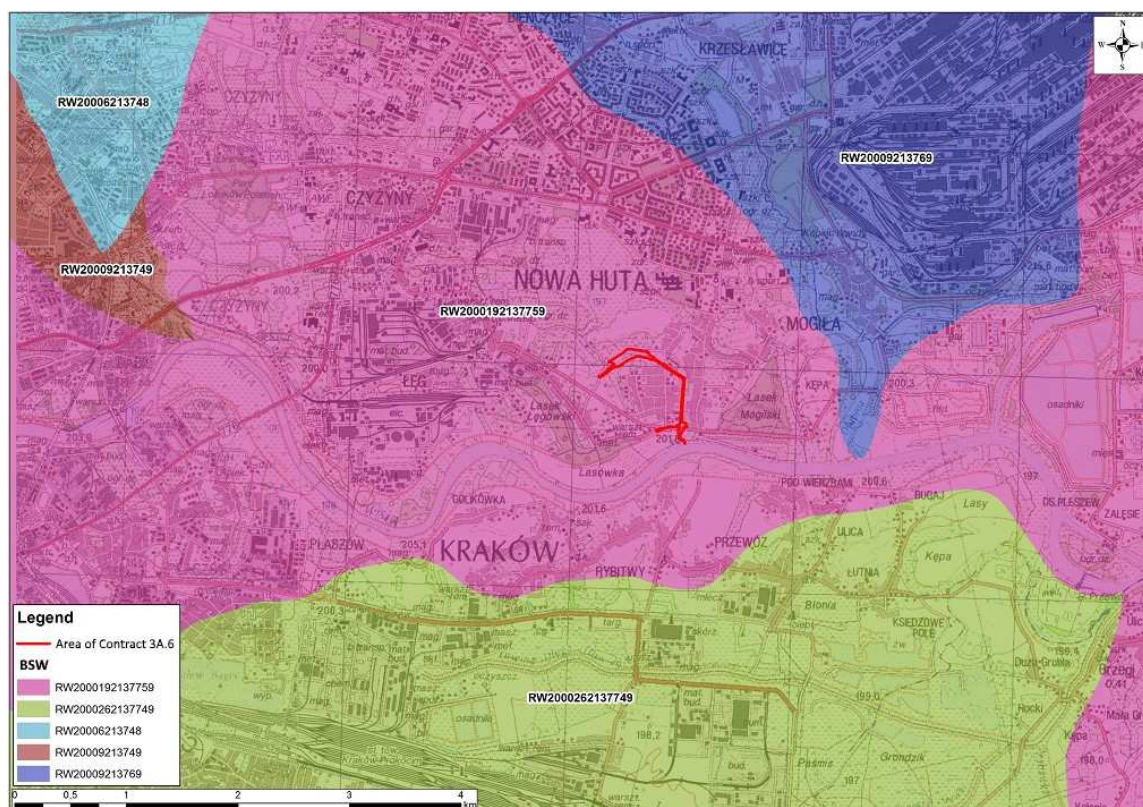


Fig. 5. Location of the Works Contract 3A.6 in reference to the BSW (source: own materials)

²¹ <http://www.gios.gov.pl/pl/stan-srodowiska/monitoring-wod> and http://www.gios.gov.pl/pl/stan-srodowiska/monitoring-wod#mon_wod_pow

4.6 Groundwater

In the implementation area of Works Contract 3A.6 there is one aquifer connected with quaternary formations, developed in the form of gravels and sands. It is a continuous aquifer, and the water table is unconfined. The groundwater horizon depth is varied and mostly ranges from 2 to 5 m b.g.l. The aquifer is fed by the atmospheric rainfall infiltration. Groundwater has a direct hydraulic relationship with surface waters in the Vistula River, and thus the groundwater level is determined by the state of water in the river, depending, among others, on the operation of the Przewóz and Dąbie barrages. The planned project is situated outside the limits of the major groundwater basins (MGB).

Implementation area of Works Contract 3A.6 is located within the boundaries of the Body of Groundwater (BGW) with the code **PLGW2000131**, covering the area of 834.5 km². The evaluation of quantitative and chemical status of BGW waters is good. The environmental objective of this BGW is to maintain the good quantitative and chemical status of the waters and the achievement of this objective is considered as not at risk.

The quantitative and qualitative status of groundwater within the boundaries of the groundwater body covering the area of the planned project is monitored on an ongoing basis as part of the state environmental monitoring and its results are published periodically on the websites of the²² Polish Geological Institute and the National Research Institute.

Location of the Contract in reference to the BGW was presented on the drawing given below (Fig. 6).

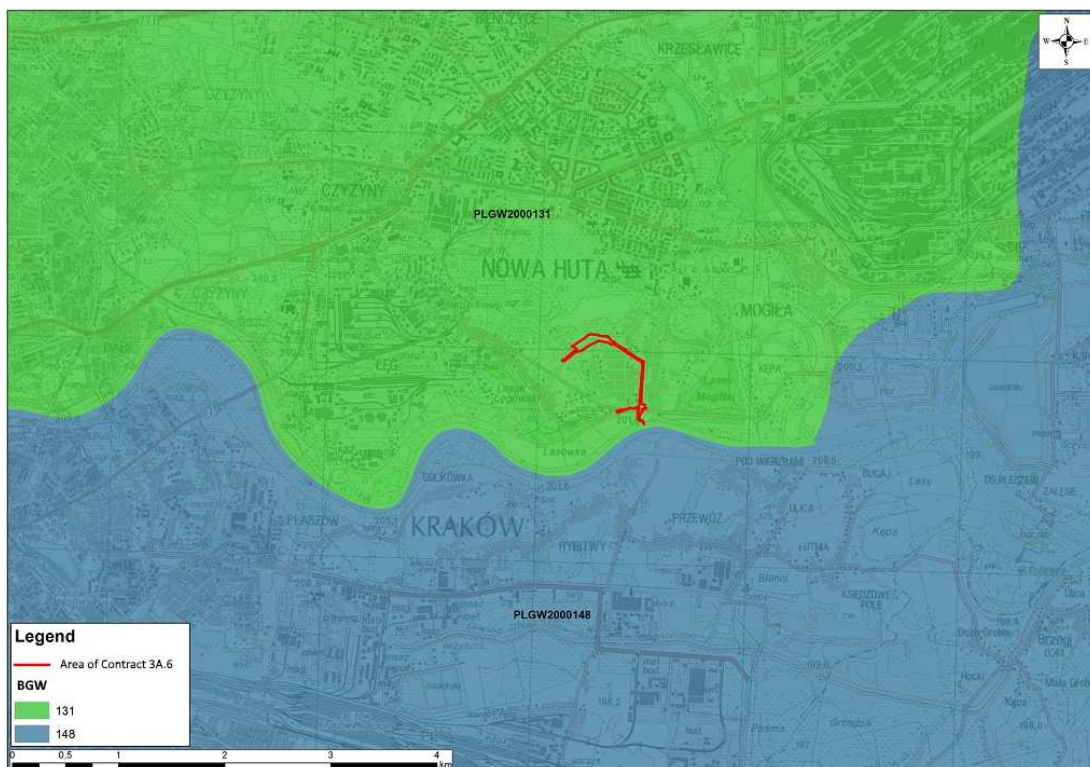


Fig. 6. Location of the Works Contract 3A.6 in reference to the BGW (source: own materials)

²² <https://www.pgi.gov.pl/psh/psh-2/monitoring-wod-podziemnych.html> and <http://mjwp.gios.gov.pl/raporty-art/2017.html>

4.7 Acoustic climate

The Works Contract 3A.6 will be executed within the administrative borders of the city of Cracow, at a distance of approx. 1.5-2 km from the center of the Nowa Huta District, about 1.5-2 km from boundaries of Elektrociepłownia Kraków [Thermal Power Plant Cracow] and from 0 to about 1 km from busy city roads (e.g. Longinusa Podbipięty Street and Jana Pawła II Alley). The acoustic climate of the Contract implementation area is therefore influenced by the surrounding urban areas, although this impact is to a significant range reduced due to the presence of high greenery and the proximity of areas with detached houses and areas without buildings (sites located south from Łąki Nowohuckie and the Vistula's embanked area).

The provisions of the valid Local Spatial Development Plan (LSDP – see mainly Fig. 3 and Fig. 4 in Chapter 4.4) set out that the southern part and the middle part of the Works Contract implementation area are mostly located in a distance of below 50 m from areas subject to acoustic protection²³ (i.e. on areas designated in the LSDP as MN – areas with detached houses). The northern part of the Works Contract implementation area is mainly surrounded by undeveloped sites (in a distance of at least about 85 m from the closest residential buildings), and they are not acoustically protected.

4.8 Nature

4.8.1 Protected natural habitats and protected species

Natural habitats from Appendix I of the Habitat Directive

The phytosociological inventory and the review of available literature data carried out at the stage of obtaining decisions on environmental conditions have revealed that:

- 1 type of natural habitats listed in Appendix 1 of the Habitat Directive have been found in the Works Contract 3A.6 implementation area and its close neighbourhood, i.e.:
 - 91E0 Riparian mixed forests of willow, poplar, alder and ash tree (*Salicetum albo-fragilis*, *Populetum albae*, *Alnenion glutinoso-incanae*) (6 patches of the willow riparian forest, with a total area of 1.15 ha, growing in vicinity of the existing water reservoir in the upper section of the Lesisko Channel).

Protected species of plants and fungi

The botanical inventory and the review of available literature data carried out at the stage of obtaining decisions on environmental conditions have revealed that:

- no protected species of plants and fungi were confirmed in the Works Contract 3A.6 implementation area and its close neighbourhood.

²³ In accordance with the Regulation of the Minister of Environment of June 14, 2007 on admissible noise levels in the environment.

Protected species of animals²⁴

The zoological inventory and the review of available literature data carried out at the stage of obtaining decisions on environmental conditions have revealed that:

- the presence of a few individuals of two common species of protected invertebrate was confirmed in the Works Contract 3A.6 implementation area and in its close neighbourhood, i.e.: Buff-tailed bumblebee *Bombus terrestris*^{(PP),LC} and Roman snail *Helix pomatia*^{(PP),LC}.
- no protected species of fish were found in the Works Contract 3A.6 implementation area. In the close neighbourhood of that area (in the Vistula riverbed) five species of protected fish are likely to occur: Weatherfish *Misgurnus fossilis*^{(PP),HDII,LC}, Stone loach *Barbatula barbatula*^{(PP),LC}, Bitterling *Rhodeus sericeus*^{(PP),HDII,LC}, Whitefin gudgeon *Romanogobio al-bipinnatus*^{(PP),HDII,LC} and Kessler's gudgeon *Romanogobio kesslerii*^{(PP),LC} (these species are listed in the Vistula River literature on the sections located upstream and downstream of the Kujawy port, so they may potentially also occur in the Vistula riverbed at the mouth of Lesisko Channel).
- eight species of protected amphibians and reptiles were found in the Works Contract 3A.6 implementation area and its close neighbourhood: Common toad *Bufo bufo*^{(PP),LC}, Green toad *Pseudepidalea viridis*^{SP,HDIV,LC}, Common frog *Rana temporaria*^{(PP),HDV,LC}, Water frog *Pelophylax esculentus*^{(PP),HDV,LC}, Pool frog *Pelophylax lessonae*^{(PP),HDIV,LC}, Smooth newt *Lissotriton vulgaris*^{(PP),LC}, Sand lizard *Lacerta agilis*^{(PP),HDIV,LC} and Grass snake *Natrix natrix*^{(PP),HDIV,LC} (in most of the cases those species were identified within the boundaries of the existing water reservoir, in upper section of the Lesisko Channel and in its vicinity).
- within the implementation site for the Works Contract 3A.6 and in its close vicinity occurrence of thirty one species of protected birds was identified (common ones mostly, except for some with average number in Poland), including seventeen species occurring e.g. within the Contract implementation boundaries (Whitethroat *Sylvia communis*^{SP,LC}, Grey heron *Ardea cinerea*^{(PP),LC}, Red-backed shrike *Lanius collurio*^{SP,LC}, Blackcap *Sylvia atricapilla*^{SP,LC}, Cuckoo *Cuculus canorus*^{SP,LC}, Fieldfare *Turdus pilaris*^{SP,LC}, European nightjar *Caprimulgus europaeus*^{SP,LC}, Eurasian blue-tit *Parus caeruleus*^{SP,LC}, Common chiffchaff *Phylloscopus collybita*^{SP,LC}, Grey wagtail *Motacilla alba*^{SP,LC}, Common nightingale *Luscinia megarhynchos*^{SP,LC}, River warbler *Locustella fluviatilis*^{SP,LC}, Common starling *Sturnus vulgaris*^{SP,LC}, Song thrush *Turdus philomelos*^{SP,LC}, Yellowhammer *Emberiza citrinella*^{SP,LC}, Eurasian golden oriole *Oriolus oriolus*^{SP,LC}, Common chaffinch *Fringilla coelebs*^{SP,LC}) and fourteen species of birds occurring beyond the boundaries of the Contract implementation site only (Great tit *Parus major*^{SP,LC}, Corncrake *Crex crex*^{SP,LC}, Garden warbler *Sylvia borin*^{SP,LC}, Common blackbird *Turdus merula*^{SP,LC}, Black redstart *Phoenicurus ochruros*^{SP,LC}, Woodlark *Lullula arborea*^{SP,LC}, Eurasian tree sparrow *Passer montanus*^{SP,LC}, Tawny owl *Strix aluco*^{OS,LC}, Eurasian collared dove *Streptopelia decaocto*^{SP,LC}, Eurasian skylark *Alauda arvensis*^{SP,LC}, Eurasian jay *Garrulus glandarius*^{SP,LC}, Eurasian magpie *Pica pica*^{(PP),LC}, European goldfinch *Carduelis carduelis*^{SP,LC}, Long-eared owl *Asio otus*^{OS,LC}).

²⁴ The species protection status is given in the superscripts after the name of each species, according to the scheme:

SP – a strictly protected species in Poland; **(PP)** – a partially protected species in Poland;

HDII,IV,V – species from Annex II, IV and/or V of the Habitat Directive;

LC – a species included on the IUCN Red List, in the category: LC – a least-concern species.

- the presence of flying and/or feeding bats, including, among others, Common noctule *Nyctalus noctula*^{SP,HDIV,LC}, Soprano pipistrelle *Pipistrellus pygmaeus*^{SP,HDIV,LC}, Common pipistrelle *Pipistrellus pipistrellus*^{SP,HDIV,LC} and Daubenton's bat *Myotis daubentonii*^{SP,HDIV,LC} was confirmed in the Works Contract 3A.6 implementation area and its close surrounding. In case of Common noctule, presence of two daily resting places of the species were also identified within the Contract implementation site.
- three species of protected non-flying mammals were found in the Works Contract 3A.6 implementation area and its close neighbourhood: European beaver *Castor fiber*^{(PP),HDII,IV,LC}, European mole *Talpa europaea*^{(PP),LC} and an unidentified species of Hedgehog of genus *Erinaceus sp.*^{(PP),LC}.

Location of the Contract in reference to the protected resources of the natural environment was presented on a map reproduced under Appendix 9 to the EMP – Map with location of the Contract in reference to natural habitats and protected species occurrence sites.

4.8.2 Protected areas

There are no areas and facilities protected under the Act of April 16, 2004 on nature protection in the implementation area of the Works Contract 3A.6 and in its immediate surrounding (up to 100 m from the borders).

The following protected sites and facilities exist in the zone from 100 m to 1.0 km from the borders of the Works Contract 3A.6 implementation area:

- Natura 2000 site “Łąki Nowohuckie” (PLH120069)
(at a distance of about 400 m to the north of the boundaries of Works Contract 3A.6 implementation zone).
- ecological site “Łąki Nowohuckie”
(at a distance of about 400 m to the north of the boundaries of Works Contract 3A.6 implementation zone, mostly overlapping with Natura 2000 site “Łąki Nowohuckie”).
- 9 specimens of old trees under protection as natural monuments
(at a distance of about 300 to about 1000 m to the west, north and east of the boundaries of Works Contract 3A.6 implementation zone).

Location of the Contract in reference to the protected areas was presented on a map in Appendix 6 to the EMP – Map with location of the Contract in reference to natural habitats and places of presence of protected species.

4.9 Cultural landscape and monuments

There are no historic objects, objects of high cultural value nor cultural objects in the Works Contract 3A.6 implementation area and in its close surrounding. No archaeological sites nor any other areas or objects under conservation protection were found here.

4.10 Population

The planned Works Contract 3A.6 is a line project located in the area of the district City of Cracow, in the district XVIII Nowa Huta.

According to data valid for December 31, 2018²⁵ the City of Cracow is inhabited by 771 069 people, and the population density is 2 355 people/km². PIB data for the City of Cracow²⁶ state that area of the left-bank district XVIII Nowa Huta is inhabited by 51 234 citizens (the population density is 783 people/km²).

Based on the information contained in the Feasibility Study (SWECO, 2018), the implementation of the works covered by the Works Contract 3A.6, together with the functionally connected reconstruction of the left-bank flood embankment of the Vistula River on the section from the Wandy bridge do the Przewóz barrage, reconstruction of the left-bank flood embankment of the Vistula River on the section from the Przewóz barrage to Suchy Jar (Works Contract 3A.1/1, so-called Section 1 and Section 2) and construction of a flood gate on the inlet channel to the Kujawy port (Works Contract 3A.5), will provide flood protection for at least 9 thousand people living in an area directly at risk of flooding with a probability of occurring once every 100 years (Q1%). Number of people protected solely as a result of the realization of Works Contract 3A.6 is estimated at around 200 people.

Issues associated with the social context of the planned Contract 3A.6 is described in details in the *Land Acquisition and Resettlement Action Plan* (LA&RAP) for the Contract in question.

4.11 Remaining ES issues

ES related issues (i.e. the ones related to environmental, social and health and safety aspects) are regulated in Poland by several provision given in binding legal acts, including e.g. the Act of April 27, 2001 Environmental Protection Law, the Act of October 3, 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments, the Act of April 16, 2004 on the nature protection, the Act of April 13, 2007 on preventing of damages to the environment and on repairing them, the Act of December 14, 2012 on waste, the Act of July 20, 1991 on Environmental Protection Inspectorate, the Act of March 14, 1985 on the State Sanitary Inspectorate, the Act of December 5, 2008 on preventing and combating infections and infectious diseases in humans, the Act of July 7, 1994 Construction Law, the Act of July 20, 2017 Water Law, the Act of June 26, 1974 Labour Code, the Act of April 13, 2007 on the State Labour Inspectorate, the Regulation of the Council of Ministers of August 24, 2004 on the list of prohibited work for juveniles and the conditions for their employment in some of these work, the Act of December 3, 2010 on implementation of some provisions of the European Union in reference to equal treatment, the Act of April 23, 1964 Civil Code, the Act of June 6, 1997 Penal Code, and others.

Legal regulations included in those acts are to e.g.:

- assure proper condition for abiotic environment and for biotic environment on site and in the areas surrounding the implemented construction investments;

²⁵ CSO – Demography Base: Results of Current Studies: Status and Structure of Population: Population: 2018: Status on 06/30: Population according to sex and cities: Małopolskie.

²⁶ At: https://www.bjp.krakow.pl/?dok_id=105105

- assure safety and health of people in reference to implementation of construction investments;
- prevent cases of sexual harassment and mobbing on work sites;
- assure proper social and labour conditions, and payment for the personnel.

Supervision over observing of provisions included in the aforementioned legal acts is performed by e.g. such numerous institutions and state authorities as the: General Directorate for Environmental Protection, Regional Directorates for Environmental Protection, Environmental Protection Inspectorate, State Sanitary Inspectorate, Construction Supervision Authorities (including Provincial Construction Inspectorates and District Construction Inspectorates), State Labour Inspectorate, Ombudsman, Governmental Proxy for Equal Treatment, Governmental Proxy for Rights of the Disabled, Police, and others.

Nonetheless, considering the importance of ES issues and the requirements of international institutions financing the OVFMP Project (including the World Bank), this Environmental Management Plan and other documents of the Contract contain numerous detailed conditions to assure the proper implementation of any valid provisions and to keep high proceeding standards in the aforementioned scope.

5 Summary of the Environmental Impact Assessment

5.1 Land surface and landscape

Impacts on the ground surface will be associated with temporary and permanent land occupation.

The area of permanent occupation related to the execution of the Works Contract 3A.6 covers about 4.3 ha.

In the construction phase, the temporary exclusion of land from the existing use will be connected, in particular, with construction of an operating backyard, storage yards and technological roads – in total not more than 0.5 ha. After completion of the construction phase, the operating backyard and storage yards will be dismantled and the land reclaimed.

More detailed information on the planned site activities is presented in the *Land Acquisition and Resettlement Action Plan (LA&RAP)*, available on the website of the OVFMP Project Coordination Unit (www.odrapcu.pl).

In terms of landscape values, the impact of the project will be local and mostly limited in time to the stage of construction works (after completion of the works the construction site will be reclaimed and developed in accordance with the design documentation). The most significant permanent change in the landscape related to the planned works will be the construction of a new hydrotechnical facility in the form of a pumping station for mobile pumps (with maneuvering yard and site flood storage reservoir) and increasing the area of the existing water reservoir in the upper part of the Lesisko Channel, as well as the necessary cutting of trees and bushes on the construction site (see also information in Chapter 5.8.1). Considering the small spatial scope of the planned works and the related necessary cutting of trees and bushes²⁷ (spatially limited only to places where the presence of trees and bushes would prevent the performance of construction works and/or safe operation of the hydrotechnical facilities²⁸), the execution of the Works Contract will not cause significant negative impacts on the landscape values.

Mitigation measures planned to limit the Works Contract implementation impact on the surface of land and on the landscape were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.1.

²⁷ In total it is planned to remove maximally about 800 trees and about 500 m² of shrubs (the quantities may be limited in the course of further designing works, see also description in Chapter 5.8.1).

²⁸ In accordance with 176(1)(2) of the Water Law Act, in order to ensure the tightness and stability of flood embankments, it is prohibited, inter alia, to plant trees or bushes on flood embankments and within less than 3 m from the embankment foot.

5.2 Climate

Modification of climatic conditions

The execution of the planned project, consisting on the one hand in modernization and re-construction of the existing and long-established hydrotechnical facilities on the left bank of the Vistula (Lesisko Channel with the existing water reservoir in the upper part of the channel), and on the other hand in construction of a relatively small new hydrotechnical facility (pumping station for mobile pumps, with maneuvering yard and site flood storage reservoir) protecting the Vistula's area beyond the embankment on the left bank against flooding by the Lesisko Stream at bankful discharge in Vistula, is not linked to the emergence of factors which could have a significant impact on the modification of climate conditions, either on a regional or local scale (project implementation does not cause significant changes in the terrain, water conditions, or the current manner of using the area in question).

Emission of greenhouse gases

Due to combustion of fuel by vehicles and construction machines on the performance stage combustion gases shall be emitted, including carbon dioxide accounted as a greenhouse gas. Furthermore, there shall be a need for electric power due to the use of site facilities, operations of machines and devices and provision of lighting for the construction site (the use of electric power is connected with the emission of greenhouse gases during its production in power plants). In view of the small scale of construction works planned to be carried out under Contract 3A.6, as well as the periodic and transient nature of emissions during the construction phase, the above-mentioned impacts can be considered to be completely insignificant in terms of their impact on climate change.

At the operation stage of the constructed hydrotechnical facilities, low demand for electricity and fuel will be associated mainly with lighting and periodic operation of the pumping station at the Lesisko Channel (during the periods of flood swellings).

Adaptation of the Contract to adverse phenomena associated with climate change

The modernized and newly built hydrotechnical facilities on the left bank of the Vistula River have been designed in accordance with binding hydraulic regulations, which include extreme events occurring in the environment due to the changes of climate (it is regulated by relevant regulations on designing, construction, and use of hydrotechnical facilities). On the other hand, Contract performance shall improve flood protection for numerous localities located on the left-bank area beyond the embankment in Cracow; thus, it would contribute to the reduction of effects of adverse phenomena accompanying the changes of climate (sudden downpours causing sudden swells in the Vistula River basin).

5.3 Air quality

The impact of the planned project on the sanitary condition of the atmospheric air will take place mainly at the construction stage, as a result of non-organized emission of gases (exhaust gases from engines of construction vehicles and machines) and dust (dustiness connected with carrying out earthworks and during transport of construction materials) accompanying the construction works. Due to the planned actions limiting the risk and effects of the above-mentioned emissions, the execution of construction works within the scope of the Contract will not cause a significant negative impact on the sanitary condition of air.

At the operational stage, the impact on the condition of the atmospheric air will be limited to occasional exhaust emissions associated with the transport of workers operating the pumping station and operations of mobile pumps (at bankful discharge), as well as periodic maintenance works (including mowing) and hydrotechnical facilities condition checks.

Mitigation measures planned to limit the Works Contract implementation impact on the quality of air were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.3.

5.4 Soil and grounds

Impact on soils on the construction stage shall mainly be associated with direct transformations of the land surface (excavations), modification of soil structure at temporarily acquired land (technological roads, construction sites), as well as with the potential possibility of polluting the soil due to a leakage of diesel derivatives. Those impacts may be local.

After completing the construction works and after the properly done ground reinstatement one shall expect significant changes to soil and water conditions and to soil productivity within temporary acquisition sites.

Except for the listed impact forms there shall be no interference in the soil layer.

At keeping the environmental protection and H&S standards there shall be no significant impact on and deterioration of the quality of soil in connection with the performance of construction works under the Contract.

Mitigation measures planned to limit the Works Contract implementation impact on the quality of soils and grounds were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.4. Information on the amount of ground masses necessary for the Contract implementation and on the planned sources of their origin is given in Chapter 2.2.

5.5 Surface water

The execution of the Works Contract 3A.6 involves local interference in the bank zone and the bottom of the Lesisko Channel (in connection with redevelopment of the embankment lock, construction of the pumping station, and redevelopment of about 1.5 km long section of the channel) and the water reservoir in the upper section of the Lesisko Channel (due to extension of the reservoir), but due to the nature and relatively small spatial scope of the above-mentioned works (the planned works encompass only an approx. 700-metre long section of the channel and an approx. 400-metre long section of the reservoir), artificial character of the channel to be redeveloped, as well as the planned mitigation measures (e.g. a ban to interfere in the channel and banks of water not covered by the performance, obligation to keep the bottom elevation for the existing water reservoir at the Lesisko Channel, ongoing monitoring of water pollution during works in the channel and within the boundaries of the existing water reservoir, etc.), the planned project will not result in a significant impact on hydromorphological, biological and physicochemical elements of standing waters. The planned manner of embankment lock operation (closed only occasionally, during periods of increased flood hazard) does not cause a risk of increase of fragmentation of water habitats or new disturbances in the migration of water organisms, compared to the state before the implementation of the Works Contract. The execution of the Works Contract will not involve the consumption of water or the discharge of sewage into the soil and water, and therefore will not affect the quantitative and qualitative status of surface waters.

The performance of construction works is associated with the potential contamination of the soil and water environment as a result of e.g. breakdown of construction machinery or vehicles causing leakage of oil derivatives, etc. The prevention of such incidents is achieved by an array of mitigation measures specified in this EMP, related to the prevention and reduction of the effects of possible emissions of pollutants to the soil and water environment. In the case of works performed in the Lesisko Channel and within the boundaries of the water reservoir existing at that channel, the Contractor is required to conduct ongoing monitoring of water quality in order to prevent the possibility of exceeding the permissible levels of pollution. Notwithstanding the foregoing, carrying out works in riverbeds or channels, as well as on the banks of waters must comply with World Bank guidelines contained in the document *“Environmental, Health and Safety Guidelines for Ports, Harbours, and Terminals”*²⁹

At the operation stage, in order to reduce the risk of events that may result in a negative impact on the environment, it is planned to carry out regular inspections and assessments of the technical condition of the constructed hydrotechnical facilities and, if necessary, to carry out necessary maintenance works and procedures. The operation of the above-mentioned hydrotechnical facilities will not change the quantitative and qualitative parameters of surface waters.

In consideration of the above circumstances, it was concluded that the performance of the Contract in question will not pose a threat to the achievement of the environmental objectives set for BSW *Wisła from Skawina to Podłężanka* (PLRW2000192137759), in the catchment area of which it will be performed.

²⁹ Document available on the website:
https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_policy_ehs-portsharborsterminals

Mitigation measures planned to limit the Works Contract implementation impact on the quality of surface water were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.6.

5.6 Groundwater

The execution of the Works Contract 3A.6 does not affect the status of quantitative and qualitative parameters of groundwater. Construction of the pumping station, redevelopment of the embankment lock, redevelopment of the Lesisko Channel's section, and extension of the water reservoir at the Lesisko Channel (at keeping the previous elevation of the reservoir's bottom) shall not result in modification of feeding conditions for water-bearing layers in the ground, shall not modify the direction of ground water flow, and shall not cause breaking or deterioration of the hydraulic connection between river water and groundwater on the left bank between the Vistula's embanked area and the area beyond the embankment. The execution of the Works Contract will not involve the consumption of water and the discharge of sewage into the soil and water, and therefore will not affect the quantitative and qualitative status of groundwaters.

The operation of the constructed hydrotechnical facilities will not change the quantitative and qualitative parameters of groundwaters.

In consideration of the above circumstances, it was concluded that the performance of the Contract in question will not pose a threat to the achievement of the environmental objectives set for BGW PLGW2000131, in the limits of which it will be performed.

Mitigation measures planned to limit the Works Contract implementation impact on the quality of groundwater were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.6.

5.7 Acoustic climate

The execution of the Works Contract 3A.6 is connected with periodical noise emission during the performance of construction works. The sources of noise will be the work of individual construction machines and vehicle traffic (including, among others, trucks). The acoustic nuisance resulting from the operation of construction machines and vehicles will be limited, both in time (only the period of works) and space (the area of works with its surroundings and access roads to the area of works). Due to the fact that a part of the Contract implementation site is located in close neighbourhood of developed area under acoustic protection (sites with low residential buildings between Zagłoby Street and Klasztorna Street – see description in chapter 4.7), slight periodic nuisances connected with noise emission may occur during the construction phase in these areas. The reduction of such impacts will be facilitated by limiting the performance of works to the daytime hours and by the Contractor's care for the technical condition of machines and equipment working on the site.

After the completion of the construction stage, the operation of the constructed facilities does not involve noise emissions (except for operations of mobile diesel pumps at the pumping station in period of flood discharge).

Mitigation measures planned to limit the Works Contract implementation impact on the acoustic climate were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.7.

5.8 Nature

5.8.1 Impact on the protected natural habitats and on the protected species of plants, fungi, and animals

Impact of the Works Contract 3A.6 on the protected elements of the natural environment shall be related to:

- The removal of up to about 800 trees and of up to about 500 m² bushes (only non-protected species and specimens) directly colliding with the planned works³⁰, which are the habitat for the occurrence and breeding of over a dozen of common protected species of birds and a feeding ground for several protected species of bats and for a beaver (as described in Chapter 4.8.1), and partly are also a part of the liquidated fragments of natural habitat 91E0 (see below).
- Liquidation of some patches of natural habitat of willow riparian forest 91E0 (with a total area of about 0.23 ha) growing in areas intended for extension of the existing water reservoir at the Lesisko Channel (the removal shall cover about 20% of the habitat's area present within the boundaries and in the close vicinity of the Contract implementation zone – see also description in Chapter 4.8.1),
- Scaring of 2 protected species of invertebrates that occur in the Works Contract implementation area and in its close neighbourhood (see description in Chapter 4.8.1),
- Scaring of 8 protected species of amphibians and reptiles that occur in the Works Contract implementation area and in its close neighbourhood (see description in Chapter 4.8.1),
- Scaring of over a dozen of protected species of birds inhabiting trees and bushes in the vicinity of the works site and additional several species of birds occurring in a close vicinity of the Contract implementation site (see description in Chapter 4.8.1),
- Scaring of several protected species of bats feeding on the edges of trees and bushes and above the water table in the Lesisko Channel and in the water reservoir existing in the upper part of the channel (see description in Chapter 4.8.1),
- Scaring of specimens of 3 protected species of mammals that occur in the Works Contract implementation area and in its close neighbourhood (see description in Chapter 4.8.1),

The above mentioned impacts – resulting mainly from the necessary acquisition of land, traffic of vehicles and machines in the construction period, and logging of trees and shrubs – shall be partially reduced due to the planned mitigation measures (including e.g. replacement planting of trees and shrubs) and in total they shall not have a significant negative impact on the state of resources of protected habitats and species, neither on a local nor regional scale. At the operational stage, the planned project does not have any negative impact on the protected resources of the natural environment (among others, it does not affect the conditions of migration of aquatic organisms – the embankment lock at the Lesisko Channel will be closed for a short period only during large floods of the Vistula and will remain open for the rest of the year).

³⁰ The scope of cutting is determined on the basis of the current state of project documentation.

In accordance with the binding provisions, removal of habitats and disturbance of protected species shall require a prior obtainment of relevant administrative decisions allowing for exceptions from bans related to the protected species (according to conditions described under item 39 of Appendix 1 to the EMP).

Mitigation measures planned to limit the Works Contract implementation impact on the protected elements of natural environment were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.8.

5.8.2 Impact on protected areas

Implementation of the planned Works Contract 3A.6 – both: on the performance stage, as well as on the use stage – shall not cause adverse impact on protected areas and objects located in its wide neighborhood. According to the information presented in Chapter 4.8.2, the nearest protected objects (natural monuments) are located at a distance of approx. 0.3-1.0 km, while the nearest protected areas – at a distance of not less than approx. 1.5 km from the borders of Contract implementation area. The scope of works planned to be carried out under the Works Contract does not cause any environmental impact beyond the boundaries of the works area and its immediate surroundings.

5.9 Cultural landscape and monuments

Implementation of the planned Works Contract 3A.6, both at the construction and operational stage, does not adversely affect historic objects, archaeological sites nor other objects and areas of cultural value. The expected earthworks may potentially result in discovering new archaeological heritage; however, for now no archaeological sites were identified within the area in question nor in its close surrounding (see also description in Chapter 4.9). As a consequence, there is no basis at the moment to forecast adverse impact of the planned works on the cultural landscape and on monuments.

Mitigation measures planned to limit the potential impact of Works Contract implementation on the cultural environment were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.9.

5.10 Material goods

As regards the protection of tangible assets, the execution of the Works Contract 3A.6 will improve the flood safety of the city of Cracow (residential estates located on the left bank of the Vistula River in the Lesisko Channel's catchment). During the works period, periodical impacts on buildings located in the neighbourhood of the construction sites and transport roads are possible, due to the periodic emission of vibrations. The implementation of works in accordance with the conditions specified in the Contract documents, including the Environmental Management Plan, should eliminate the risk and/or significantly reduce the possible effects of the above-mentioned potential negative impacts on material goods.

Issues associated with the social context of the Works Contract 3A.6, including expropriation of properties, restriction of the previous use method, or access to properties, are described in details in the *Land Acquisition and Resettlement Action Plan (LA&RAP)* for the Contract in question.

5.11 Health and safety of people

The designed construction works performed under Contract 3A.6 may temporarily deteriorate the quality and standard of living of residents, but that impact shall be small, temporary and reversible. Due to the performance there will be increased emission of noise in vicinity of the works and dusting shall increase locally, and – due to the increased traffic of trucks – emission of combustion gases shall raise. However it shall be emphasized that those impacts would be temporary and limited, and they would cease at the completion.

The operational stage is associated with a positive impact on the people and their properties. The main objective of the Contract is to protect people and their material goods against flooding by water from the Lesisko Channel during bankful discharge in Vistula. Operations of the developed hydrotechnical facilities shall increase the feeling of safety among people living in the areas located on the left bank of the Vistula in Cracow in the Lesisko Channel's catchment.

Mitigation measures planned to limit the Works Contract implementation impact on the health and safety of people were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.11.

5.12 Exceptional hazards to the environment

Implementation of the planned Works Contract is associated with a possibility of occurrence of the following crisis or emergency situations, which may cause exceptional hazard to the environment:

- **Uncontrolled emission (leakage) of diesel substances**
There may be an emergency situation on the performance stage, what would result in a leakage of diesel derivatives from vehicles, construction machines, tanks, etc., polluting surface water of land surface (including soil). Limitation of the risk and effects of such events takes place based upon proper organization of the site facilities and care for the proper technical conditions of vehicles, and machines and equipment applied on site, and – in case of their occurrence – based upon application of procedures referring to crisis and emergence situations described in the EMP.
- **Fire or explosion of flammable substances**
There may be an emergency situation on the performance stage associated with fire (e.g. due to equipment failure, negligence by the personnel, explosion of flammable substances, lightning strike, etc.). Limitation of the risk and effects of such events takes place based upon strict observance of H&S rules, proper organization of the site facilities and care for the proper technical conditions of vehicles, and machines and equipment applied on site, and – in case of their occurrence – based upon application of procedures referring to crisis and emergence situations described in the EMP.
- **Identification of unexploded shells or ordnance**
Dangerous military materials, e.g. unexploded shells and ordnance, may be found on the performance stage. Limitation of a potential hazard associated with such events takes place based upon provision of an ongoing sapper supervision over the works, and – in case of identifying such materials – upon strict observance of procedures referring to cases of identifying presence of unexploded shells and ordnance described in the EMP.

- Immediate water raise, flood

Water level may raise immediately in water-courses within the construction site or a flood may occur on the performance stage, what would pose risk to health and life of the personnel and cause material damage on site. In order to minimize potential effects of such events the Contractor shall consider flood threat at organizing the site facilities and the remaining part of the construction site, and shall develop a *Flood Protection Plan for the Construction Site* and shall strictly apply conditions contained therein.

- Possible failure of the embankment lock and mobile pumps at the operational stage

Embankment lock operation is associated with a potential risk of limiting or stopping the flow of water through the main duct of the lock due to a failure of non-return flap valves, blocking of the duct by items brought by water, etc. In the case of the pumping station, it is theoretically also possible that the mobile pumps fail at works during the flooding period. Limitation of risk in case of such events takes place based upon particular design and technical solutions applied for the planned objects, in accordance with the guidelines binding for designing of hydraulic objects (e.g. particular dimensions and proper construction of hydrotechnical structures, relevant selection of materials and equipment for objects to be developed, determined operational rules for a set of mobile pumps at the pumping station, etc.). Considering that protection and the fact that the said hydrotechnical facilities have been designed including hydrological data defining the scale of flows in rivers within the discussed area in computational periods, it may be stated that the discussed hazard is highly potential and the probability of its occurrence is minor. At the operational stage, the constructed objects will be applied in accordance with the use manual, including any formal and legal requirements on both: environmental and technical aspects, as well as safety of the structure.

Mitigation measures planned to limit the effects of potential crisis situations, which may emerge due to or in the time of Works Contract implementation were tabulated in Appendix 1 to this EMP – Plan of mitigation measures – and described in Chapter 6.12.

5.13 Other hazards related to ES

Implementation of the Works Contract 3A.6 may relate to numerous impacts related to ES issues (i.e. environmental, social and health and safety aspects). Except for the issues discussed above in Chapters 5.1-5.12, the following additional issues or hazards related to that subject may occur during implementation of the Contract, e.g.:

- Accidents and near misses, including participation of people associated with implementation of the Contract and/or of third parties;
- Cases of such unacceptable behavior on work sites as sexual harassment or mobbing;
- Cases of intentional or unintentional violation of labour law's provisions, including the ones associated with social conditions and labour conditions, and with payment to the personnel;
- Cases of infections with sexually transmitted diseases (including HIV/AIDS) or other infectious diseases (including those caused by coronaviruses, e.g. COVID-19), resulting from the lack of knowledge or from non-compliance with applicable rules on preventing and controlling infections of that type.

Due to significant social effects of those hazards, this Environmental Management Plan and other documents of the Contract contain numerous detailed conditions to prevent and efficiently react in case such events occur, and to assure proper implementation of any provisions of national legislation in that scope (see e.g.: Chapter 6.13).

5.14 Cumulative impact

The Works Contract 3A.6, which is the subject of the EMP, will be executed in the immediate adjacency of the execution area of another project, i.e. Works Contract 3A.1/1 titled *Construction of Vistula embankments in Cracow – Section 1, Section 2*, falling within the scope of Subcomponent 3A of the OVFMP Project (see Fig. 1 in Chapter 2.1). The information presented, inter alia, in the Environmental Management Plans for Contracts 3A.6 and 3A.1/1 as well as in the environmental decisions issued for the aforementioned projects, provides that the execution of none of the aforementioned Contracts involves the occurrence of significant emissions or other significant impacts on the environment, the scale of which would result in the possibility of occurrence of significant threats to the abiotic or biotic environment, even if construction works for both Contracts are conducted at the same time. It can be concluded by analyzing the mitigation actions described in the EMP documents for the above-mentioned Contracts that if construction works are carried out in accordance with the conditions contained therein, there is no risk of significant cumulative negative impacts, even if both Contracts are implemented at the same time. Similarly, at the operation stage of the constructed hydrotechnical facilities on the left bank of the Vistula river in Cracow, no negative environmental impacts are expected to occur as a result of possible accumulation of potential impacts of each of them. Apart from the aforementioned Works Contract 3A.1/1, the authors of this EMP are not aware of any other planned projects that could lead to the occurrence of cumulative environmental impacts with the effects of Works Contract 3A.6.

6 Description of mitigation measures

In order to limit potential adverse impact of the planned Contract onto particular elements of the environment, Appendix 1 to this EMP provides a list of mitigation measures binding for the Contractor of Works Contract 3A.6. The measures have been developed based upon the conditions included in the binding decision on environmental conditions, including a supplementation with additional conditions determined at the development of the EMP. A summary of main mitigation measures' categories has been presented in the following parts of this chapter, with a breakdown into particular components of the environment discussed in Chapters 4 and 5 of the EMP.

Notwithstanding the above (in accordance with the condition in item no. 91 in Appendix 1 to the EMP), the Contractor shall be obliged to apply and observe all ES policies' requirements and conditions (i.e. the ones related to environmental, social and health and safety issues) as determined in the Contract documents, in the Operational Policies and Procedures of the World Bank³¹ concerning protection of health and environment, as well as safeguard policies, in the WBG's Environmental, Health and Safety (EHS) Guidelines³², in the ES Code of Conduct (developed on the stage of filing a bid³³), in documents of the Contractor listed in Chapter 6.14 and in item no. 71 in Appendix 1 to the EMP, and as results from the legislation valid in Poland (including the Labour Code, the Construction Law, and others).

Temporary and permanent land acquisitions in connection with the implementation of the Contract will take place according to the rules specified in the Land Acquisition and Resettlement Action Plan (LA&RAP).

6.1 Land surface and landscape

Basic forms of the potential adverse impact of the planned implementation of Works Contract 3A.6 on the surface of land and on the landscape were provided in Chapter 5.1.

In order to limit those impacts Appendix 1 to the EMP implements mitigation measures to e.g.:

- Limit the impact on the condition of land surface and landscape associated with land acquisition (e.g. items no. 5, 6, 9, 13, 14, 15, 25, 26, 35, 40, 42, 44, 45);
- Limit the damage to landscape values associated with the removal of or damages to trees and shrubs (e.g. items no. 16, 18, 19, 20, 21, 22, 23, 24, 42, 46).

³¹ Available on e.g. a website:
<https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx#S3-2>
(in part titled *Investment Project Financing / Environmental and Social Safeguard Policies*).

³² The guidelines are published on the World Bank's internet service at:
https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/EHS-Guidelines/ and
<https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CVID=jOWim3p>

³³ In accordance with conditions given in the bidding documents in part ITB 11.1 (h).

6.2 Climate

Due to the absence of adverse impact on the climate (see: description under Chapter 5.2), it was not stated necessary to implement mitigation measures for that environmental component. Some mitigation measures – listed in Chapter 6.3 – are indirectly connected to the protection of climate, and they refer to the protection of air against contamination with combustion gas.

6.3 Air quality

Basic forms of potential adverse impact of the planned Works Contract 3A.6 on the air were presented in Chapter 5.3.

For the purpose of limiting those impacts Appendix 1 to the EMP implements mitigation measures to e.g.:

- Limit the contamination of air with combustion gas (e.g. items no. 49, 59);
- Limit the contamination of air due to emission of dust (e.g. items no. 60, 61, 67).

6.4 Soils and grounds

Basic forms of potential adverse impact of the planned Works Contract 3A.6 on soils and grounds were presented in Chapter 5.4.

For the purpose of limiting those impacts Appendix 1 to the EMP implements mitigation measures to e.g.:

- Limit the damage to soil due to land acquisition (e.g. items no. 5, 6, 13, 14, 15, 25, 26, 35, 40);
- Limit the loss of top-soil layer (e.g. items no. 41, 42, 43, 44, 45);
- Limit the risk of polluting the ground on the performance stage (e.g. items no. 47, 48, 49, 52, 53, 54, 55, 56, 57, 58, 66, 67, 68, 69, 70).

6.5 Surface water

Basic forms of potential adverse impact of the planned Works Contract 3A.6 on surface water were presented in Chapter 5.5.

For the purpose of limiting those impacts Appendix 1 to the EMP implements mitigation measures to e.g.:

- Limit the risk of polluting the water on the performance stage (e.g. items no. 5, 6, 13, 14, 15, 25, 26, 35, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 66, 67, 68, 69, 70);
- Limit the risk of polluting the water on the operational stage (e.g. items no. 48);
- Limit the risk of adverse impact on biological elements of the water quality (e.g. items no. 35, 37, 38, 50, 85).

6.6 Groundwater

Due to the fact that the potential implementation impact of Works Contract 3A.6 on groundwater (as described in Chapter 5.6) essentially overlaps impacts on the ground environment

and on the surface water (described in Chapters 5.4 and 5.5), it was not stated necessary to implement additional mitigating measures in that scope, i.e. other than mitigation measures for the ground environment (see: description in Chapter 6.4) and mitigation measures for the surface water (see: description in Chapter 6.5).

6.7 Acoustic climate

Basic forms of potential adverse impact of the planned Works Contract 3A.6 on the acoustic climate were presented in Chapter 5.7.

For the purpose of limiting those impacts Appendix 1 to the EMP implements mitigation measures to e.g.:

- Limit noise generated on the performance stage and to limit the impact of that noise on acoustically protected sites (e.g. items no. 14, 15, 59, 62, 63, 64, 65).

6.8 Nature

Basic forms of potential adverse impact of the planned Works Contract 3A.6 on the abiotic nature's resources were presented in Chapter 5.8.

For the purpose of limiting those impacts Appendix 1 to the EMP implements mitigation measures to e.g.:

- Limit losses in environmental resources associated with land acquisition, including acquisition of environmental habitats and habitats of plants and animals (e.g. items no. 5, 6, 13, 14, 15, 26, 27, 35, 38, 41, 42, 43, 44, 45, 85);
- Limit losses in environmental resources associated with logging of or damages to trees and shrubs (e.g. items no. 16, 17, 18, 19, 20, 21, 22, 23, 24, 34, 38, 39, 42, 46, 85);
- Eliminate or limit losses in environmental resources associated with accidental mortality of specimens of protected species on site (e.g. items no. 17, 25, 26, 27, 29, 30, 31, 32, 33, 34, 35, 37, 38, 41, 50, 85);
- Eliminate or limit the performance impact on the results of breeding and migration of protected animal species (e.g. items no. 25, 26, 27, 30, 33, 35, 36, 38, 39, 47, 48, 50, 51, 62, 85);
- Eliminate or limit the performance impact on the spread of invasive plant species of foreign origin (e.g. items no. 28, 38, 85);
- Limit a risk of adverse impact on biological elements of the water quality (e.g. items no. 35, 37, 38, 85).

6.9 Cultural landscape and monuments

In accordance with a description given in Chapter 5.9, the planned implementation of Works Contract 3A.6 does not provide adverse impact on known cultural assets. In order to eliminate the potential adverse impact on yet undiscovered cultural objects, Appendix 1 to the EMP implements mitigation measures to assure the performance of works under current archaeological supervision and the implementation of relevant procedures in case of discovering mobile heritage or archaeological sites on the performance stage (items no. 82, 83, 84).

6.10 Material goods

In accordance with a description given in Chapter 5.10, the planned implementation of Works Contract 3A.6 does not provide significant adverse impact on the condition of material goods. In order to eliminate the potential adverse impact of the works on material goods, Appendix 1 to the EMP implements mitigation measures to provide protection for buildings, roads, and other infrastructural elements against unfavorable impact of the works and / or transportation associated with implementation of the Contract (items no. 5, 6, 7, 8, 9, 11, 12, 73). Some mitigation measures listed under Chapter 6.1, as well as measures listed under items no. 3 and 4 in Appendix 1 to the EMP – in reference to the purchase and to the compensation due to implementation of the Contract, are indirectly associated with the protection of material goods, and those are to limit the impact of land acquisition during the works (according to the rules specified in the Land Acquisition and Resettlement Action Plan).

6.11 Health and safety of people

Basic forms of potential adverse impact of the planned Works Contract 3A.6 on the health and safety of people were presented in Chapter 5.11.

For the purpose of limiting those impacts Appendix 1 to the EMP implements mitigation measures to e.g.:

- Limit the impact of the planned works on the sanitary condition of air (listed under Chapter 6.3);
- Limit the impact of the planned works on the acoustic climate (listed under Chapter 6.7);
- Eliminate or limit the risk of chemical contamination of water and ground on the performance stage (listed under Chapters 6.4, 6.5, and 6.6);
- Secure safety on site and in its vicinity (items no. 7, 8, 10, 11, 12, 47, 48, 71, 72, 73, 74, 75, 76, 77, 87, 91, 99, 100, 101);
- Assure proper reaction in case of exceptional hazards (items no. 78, 80, 81, 99).

6.12 Extraordinary hazards to the environment

Basic types of exceptional hazards (crisis situations), which may potentially occur due to the implementation of Works Contract 3A.6 were presented in Chapter 5.12.

In order to limit potential effects of crisis situations Appendix 1 to the EMP implements mitigation measures to e.g.:

- Eliminate or limit the risk of chemical contamination of water and ground on the performance stage (listed under Chapters 6.4, 6.5, and 6.6);
- Secure safety in case of fire (e.g. item no. 71);
- Secure safety in case of identifying unexploded shells and ordnance (e.g. items no. 71, 72, 81, 87);
- Secure safety in case of flood (e.g. items no. 78, 79);

- Assure proper reaction in case of exceptional hazards (items no. 78, 80, 81, 99).

6.13 Other ES hazards

Exemplary forms of additional hazards associated with ES issues (other than the ones discussed previously in Chapters 5.1-5.12) were presented in Chapter 5.13.

In order to prevent hazards of that type, except for the measures listed in Chapters 6.1-6.13, Appendix 1 to this EMP implements additional mitigation measures to e.g.:

- prevent accidents and near misses on work site and in other places related to the implementation of the Contract (e.g. items no. 91, 92, 93, 94, 99 and others listed in Chapters 6.11 and 6.12);
- combat such unacceptable behavior on work site as cases of sexual harassment or mobbing (e.g. items no. 95, 96, 99);
- assure proper social conditions, and labour conditions and payment to the personnel engaged in implementation of the Contract, in compliance with the law (e.g. items no. 97, 98, 99);
- assure proper procedures for ongoing information provision on issues and hazards associated with the aforementioned subject (e.g. item no. 99);
- reduce the risk of spreading infectious diseases, especially sexually transmitted diseases (including HIV/AIDS) and diseases caused by coronaviruses (e.g. COVID-19) (e.g. items no. 100, 101).

6.14 Requirements for implementation of action plans in the construction phase

For the purpose of providing proper performance organization, as well as for the proper implementation of conditions determined under Appendices 1 and 2 to the Environmental Management Plan, the Contractor is obliged to develop and obtain the Engineer's acceptance for the following documents, which shall subsequently be implemented (see also item no. 71 in Appendix 1 to the EMP):

- Construction site organization plan, which should contain such elements as e.g.:
 - location of the site facilities,
 - development of the site facilities,
 - protection of the site facilities,
 - service roads,
 - environmental protection on the site facilities, technological roads, and yards.
- Waste management plan, which should contain such elements as e.g.:
 - encountered and predicted types and volumes of waste,
 - means of preventing adverse impact of waste on the environment,
 - means of waste management considering collection, transportation, recovery and treatment of waste,
 - type of generated waste and method for its storage.

- Quality assurance plans (general one and detailed ones), which should contain such elements as e.g.:
 - works performance organization,
 - organization of traffic at the construction site, including marking of the works,
 - H&S and environmental protection,
 - list of working teams,
 - scope of duties of the key personnel,
 - quality control,
 - methods for controlling the level of noise emissions as well as air, soil and water pollution (to the extent relevant to the type of works),
 - laboratory tests.
- Flood protection plan for the site for the performance time, which shall contain the following:
 - monitoring of hydrological and meteorological conditions,
 - conditions for accommodation of flood flows during the performance,
 - the rules of work for the Contractor's team in the period of flood risk,
 - basic duties of the managing staff during the flood risk,
 - list of managing staff in the period of flood risk,
 - list of equipment and transport means needed to conduct rescue actions.
- Health and safety plan (BIOZ Plan), which should contain such elements as e.g.:
 - indication of plot or land development elements, which may create a risk to safety and health of people,
 - information concerning expected hazards that could occur during the performance, defining the scale and types of hazards and the place and time of occurrence, including reference to the natural environment,
 - information on designation and marking for construction work sites, according to the type of hazard,
 - information on the method of training for the employees prior to the commencement of particularly hazardous works,
 - determining the method of storing and transport of hazardous materials, goods, substances and preparations at the construction site,
 - indication of technical and organizational means of safeguarding against hazards connected with the construction works in increased health risk zones, or in their immediate vicinity, including means of safe and efficient communication allowing for quick evacuation in the case of fire, failure, and other hazards,
 - indication of the storage location for construction site's documentation and documents necessary for proper operation of machines and other technical devices,
 - information related to the current rules of conduct in case of an epidemic state or an epidemic risk state being announced (including conditions given in item no. 101 in Appendix 1 to the EMP).

At developing the aforementioned documents the Contractor shall include e.g. provisions of the decision on environmental conditions (and of other administrative decisions related to the

environmental protection, if applicable), conditions determined in the EMP, the appropriate Operational Policies and Procedures of the World Bank³⁴ concerning protection of health and environment, as well as safeguard policies, the WBG's Environmental, Health and Safety (EHS) Guidelines³⁵, the ES Code of Conduct (developed on the stage of filing a bid³⁶) and binding provisions of the state law (including the Labour Code, the Construction Law, and others).

³⁴ Available on e.g. a website:
<https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx#S3-2>
(in part titled *Investment Project Financing / Environmental and Social Safeguard Policies*).

³⁵ The guidelines are published on the World Bank's internet service at:
https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/EHS-Guidelines/ and
<https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CVID=jOWim3p>

³⁶ In accordance with conditions given in the bidding documents in part ITB 11.1 (h).

7 Description of measures related to environmental monitoring

Appendix 2 to this EMP provides a summary of monitoring measures binding for the Contractor for the Works Contract 3A.6. Those measures have been developed based upon the conditions included in the valid decision on environmental conditions, along with additional conditions established on the stage of EMP development.

Monitoring measures listed in Appendix 2 to the EMP belong to one category:

- Monitoring for implementation of mitigation measures from Appendix 1 to the EMP (items no. 1-101 in Appendix 2 to the EMP).

8 Public consultations

8.1 Public consultations on Environmental and Social Management Framework (2015)

The draft ESMF was subject to public consultations conducted in accordance with the World Bank's operational policy OP 4.01. Their purpose was to allow the society to acknowledge contents of that document and to assure the possibility of filing potential remarks, enquiries, and applications to its contents.

Documentation on the public consultations process for the ESMF is available on a website of the Odra-Vistula Flood Management Project Coordination Unit^{37,38}.

8.2 Public consultations on the EIA stage (2019-2020)

In accordance with the Polish EIA procedure, on the stage of issuing a decision on environmental decision, the planned project falling within the scope of the Works Contract 3A.6 shall be subject to obligatory public consultations. On the EIA procedure stage the consultations with the public were done by the unit issuing the ED, i.e. RDOŚ in Cracow.

The description of individual stages of the EIA proceedings conducted at the stage of issuing the decision on environmental conditions, together with the description of public consultations conducted by RDOŚ in Cracow within the framework of the aforementioned proceedings, is presented in the text of the decision of the Regional Director for Environmental Protection in Cracow dated July 27, 2020 on environmental conditions (ref. no.: OO.420.4.4.2019.BM – Appendix 4a to this EMP).

8.3 Public consultations on EMP (2020)

The draft of this document is subject to the procedure of public consultations conducted in accordance with the operational policy of the World Bank (*OP/PB 4.01*).

After the draft of an EMP document has been prepared, its electronic version is placed on publicly available websites. Detailed information on the possibility to get to know the content of this document and possibilities to lodge motions and remarks (jointly with detailed contact data (e-mail address, office hours, telephone numbers) is provided for public information in the local press and on the website of the implementation unit of the Contract being subject to EMP.

In view of the current situation of the COVID-19 epidemic, the action plan for the publication of the Environmental Management Plan takes into account the World Bank's Technical Note *"Public Consultation and Stakeholder Engagement in World Bank Supported Activities, in the event of restrictions on public meetings"*.

The meeting so far organized as part of the publication of the document in the form of an open debate will be replaced by the organization of a webinar, i.e. a type of webinar conducted and implemented with the use of webcast technology, which enables two-way

³⁷ http://www.odrapcu.pl/doc/OVFMP/RPZSiS_Zalacznik_08_Raporty_z_procedury_upublicznienia_projektu_EMAF.pdf

³⁸ http://www.odrapcu.pl/doc/OVFMP/RPZSiS_Zalacznik_09_Raporty_z_konsultacji_spoecznych_RAF.pdf

communication between the meeting leader and participants, using virtual tools. The meeting will be organized through Microsoft Teams application. This program allows you to organize and conduct a webinar, with the possibility of sharing, among other things, a presentation or a screen view, as well as switching between several speakers and asking questions by participants in a chat (only in writing) and answering them by the speakers. Participants are only required to have access to the Internet and a web browser – no other program is required to install on their computer to join the webinar.

In connection with the above, the announcement about the publication of the EMP document will contain information about the date and time of the start of the webinar together with an indication that a link will be made available on the Investor's website to join the webinar.

In order to allow questions to be asked during the period of publication of the EMP, a helpline will be launched. The information about the helpline will also be included in the announcement about the publication of the EMP.

Comments from the public that need to be taken into account are introduced into the EMP document and prepared for its final version. An EMP in this form is also sent to the World Bank to obtain the "No objection" clause.

9 Organizational structure of EMP implementation

Contract 3A.6 is a part of the Odra-Vistula Flood Management Project co-financed from the funds of the World Bank, the Council of Europe Development Bank, the European Union Cohesion Fund, and the State budget. Therefore, the structure of supervision over implementation of the EMP must correspond to both: regulations of the Polish law, as well as the requirements of the World Bank.

9.1 Odra-Vistula Flood Management Project Coordination Unit

The overall coordination of the implementation of the individual EMPs within the Project is the responsibility of the Project Coordination Unit (PCU), which functions as an organizational unit within the structures of the National Water Management Authority (KZGW), which is an organizational unit of the State Water Holding Polish Waters (PGW WP).

The PCU assignments are as follows:

- management of tasks of Project Implementation Units (PIU/JRP) and Project Implementation Units (PIU/JWP), within the scope of tasks included in the Project;
- technical assistance and support to the PIU/JRP and PIU/JWP in the implementation of the tasks of the Project, including the application of World Bank procedures on procurement, environmental protection and social issues;
- preparation of annual work programmes for the Project and evaluation of their progress;
- supervise the work of the Project and evaluate their progress;
- ongoing control and monitoring of funds allocated for the implementation of the Project and participation in the management of funds of the Project;
- reporting, including preparation and submission of quarterly reports on the implementation of the Project to the World Bank, the CEB and the Steering Committee.

9.2 Project Implementation Unit

An entity which is directly responsible for implementation of the EMP for the Contract and for monitoring of the progress of its implementation is the Project Implementation Unit (PIU), i.e. State Water Holding Polish Waters, Regional Water Management Authority in Cracow.

Due to implementation of the OVFM Project, the Project Implementation Office (PIO) was assigned within the PIU structure, which is a separate structure supervised by the President of State Water Holding Polish Waters. This structure is transparent and has a high decisive level, which increases the effectiveness of the Contract implementation.

As a part of EMP implementation supervision, the PIO fulfils the following assignments:

- monitoring of the EMP implementation progress;
- financial management and bookkeeping;
- preparation of required reports for the needs of EMP implementation monitoring and coordination of its execution by all services engaged in the EMP implementation.

The scope of PIO employees' duties connected with the fulfilment of supervision over EMP implementation³⁹ is as follows:

- managing, coordinating, and supervising the EMP implemented by the Designer, the Consultant, and the Contractor;
- direct supervision over the correct Contract implementation;
- cooperation with the PCU;
- conducting an administrative and legal supervision over EMP implementation;
- verifying the Reports and studies on EMP implementation, as prepared by the Consultant and by the Contractor;
- conducting a financial supervision over EMP implementation;
- supervising the proper application of formal procedures during implementation of the EMP, as required by the Works Contract, the Building Law, the Environmental Protection Law, and others.

9.3 Engineer - Consultant

The role of the Engineer is to support the PIU (PGW WP RZGW in Cracow) in an effective conduction of the whole Works Contract process (from preparation of the Contract to its settlement).

The Consultant/Engineer shall be selected using QCBS method (quality and cost based selection), in accordance with the "Guidelines: Selection and Employment of Consultants by World Bank Borrowers".

In accordance with the scope specified in the Contract Engineer Agreement, the Engineer/Consultant shall be obliged to perform e.g. the supervision over EMP implementation⁴⁰, comprising the following:

- monitoring of EMP implementation, as done by the Contractor;
- monitoring of the Contractor's activities;
- checking the quality of construction works performed by the Contractor and built-in construction products, and especially preventing the usage of building materials which are defective and not accepted for use in the construction industry;
- representing the Investor on site by performing the control of the compliance of the construction process with the design and with the construction permit/investment project implementation permit, and with regulations related to the environmental protection and technical know-how;
- supervision over all issues related to the environmental protection by specialists experienced in the field of environmental protection (including a key environmental management expert) and by other Engineer's personnel;
- constant monitoring over proper implementation of measures mitigating the adverse environmental impact;

³⁹ This supervision is carried out mainly by the Environmental Specialist in the PIU team.

⁴⁰ This supervision is carried out mainly by the Environmental Management Expert, OH&S Specialist, Supervision Inspectors and Resident Engineer

- conduction of additional tests, if it would be necessary to verify the reports of the Contractor;
- identifying problems resulting from harmful environmental impact caused by the construction works, and presentation of solutions to those problems;
- verifying and accepting construction works being covered or of concealed works, participation in tests and technical commissioning of technical installations and devices, as well as preparation of and participation in performing the commissioning activities for finished engineering objects and handing them over for use;
- confirmation of the works factually completed and of the removal of defects, as well as, at the request of the Investor, verification of site's settlements.

9.4 Contractor

A Contractor shall be selected for the purpose of performance, and it shall be responsible for implementation of individual EMPs. The Contractor's liabilities in that scope are as follows:

- conducting construction works according to the rules specified in the EMP, in accordance with contract conditions and design documentation, pursuant to applicable legal provisions and requirements of administrative decisions issued for this Contract;
- appointment of the EMP Coordinator, mentioned in item no. 84 of Appendix 1 to the EMP;
- ensuring permanent nature supervision (including a team of experts-naturalists listed in item no. 85 of Appendix 1 to the EMP), sapper supervision (according to item no. 87 of Appendix 1 to the EMP) and archaeological supervision (according to item no. 86 of Appendix 1 to the EMP);
- ensuring the permanent H&S supervision, referred to in item no. 93 of Appendix 1 to the EMP;
- ensuring the Sexual Harassment and Mobbing Prevention Specialist, referred to in items no. 95 and 96 of Appendix 1 to the EMP;
- implementation of the Engineer's recommendations (including environmental supervising experts and the Investor's supervising inspector) concerning implementation of the EMP;
- ensuring – prior to the commencement of works – the preparation of: BIOZ Plan, Waste Management Plan, Quality Assurance Plan/Plans, Flood Protection Plan for the site for the performance time, and Construction Site Organization Plan;
- if it will be necessary, the Contractor's environmental team would develop necessary materials and applications for the obtainment of permits/decisions for departures from bans to protect species of plants, fungi or animals based upon the rules of and in the mode specified by the NP Act (of April 16, 2004). The above-mentioned decisions issued by RDOŚ/GDOŚ are to be requested for by the Contractor. The Contractor's duty is to implement the provisions of obtained decisions for departure from the protection of species of plants, fungi or animals;
- keeping the construction site records;
- drafting the reports (e.g. monthly report and final report, report to the RDOŚ and/or to the GDOŚ [the latter only in the scope resulting from decisions obtained from those authorities on the implementation stage, if the Contract would need to obtain such decisions]);

- preparing memos and reports concerning the environmental protection;
- applying to the Investor for modification of design solutions, if it is justified by a necessity of increasing safety for performance of the construction works or improving the construction process related to implementation of the EMP;
- repairing the potential faults/defects, which would be notified by the Engineer and/or by the Investor (in case the notification period for defects, guarantee, and warranty would be supported by the Engineer) during the works and during the defects, guarantee, and warranty notification period. The Contractor is obliged to report any actions implemented to remove the faults/defects. The report shall be filed to the Engineer/Investor.

10 EMP implementation schedule and reporting procedures

Implementation of the EMP shall allow the parties involved in the preparation, performance and supervision of the Works Contract, for:

- identifying different environmental aspects which have a considerable impact on the state of the environment, and therefore allow for controlling, correcting, and reducing them, but which consequently generate economic effects;
- rectifying adverse consequences of the works conducted during the implementation to the benefit of the environment and financial results;
- determining the aims and measures performed within the adopted environmental policy, covered by the EMP, which require expenditures and bring tangible effects;
- identifying and eliminating prospective hazards and failures, preventing and removing the environmental effects, which may be connected with them and which may entail losses disproportional to the preventive costs;
- using the natural resources reasonably, with minimum environmental loss and optimum generation of costs.

Furthermore, implementation of recommendations and measures required under the EMP may reduce or even eliminate a risk of occurrence of adverse social, environmental and economic events and phenomena related to the Contract, and in particular:

- a risk to ignore the environmental protection issues during the process of implementation of measures by the Contractor;
- a risk of escalation of the local community protests as a result of a failure of the Contractor to adhere to technologies for conducting the works and environmental procedures approved by the Engineer;
- a risk of additional environmental penalties;
- a risk of additional damage to the environment.

Taking into account the significance of the aspects specifying the environmental conditions and community conditions, the following EMP implementation procedures are anticipated:

- prior to the selection of the Contractor, the Employer shall submit a draft of this EMP to the PCU in order to obtain its opinion;
- after the PCU expresses no objection with regard to the submitted documentation of the EMP, the document will be included in the tender documentation for the selection of the Contractor;
- the EMP will then be subject to public consultation according to the procedure currently in force;
- at the same time, the Employer shall submit to the World Bank a draft of this EMP in order to inform about the ongoing procedure and, if possible, to secure an opinion;
- following the public consultation, the EMP will be supplemented with the results of the consultation and the final version will be submitted for approval by the World Bank (issuance of “no objection”);

- after the issuance of “no objection” by the World Bank for this EMP, it will be published in the final version applicable in the Contract and included in the tender documentation for the selection of the Contractor;
- this inclusion will take place no later than before selecting the Contractor and signing the Works Contract with them, in such a way that the final price of the Contractor’s offer relates to and takes into account all the conditions contained in the EMP;
- all activities of the Contractor shall be systematically reported (once a month), in Polish and, if required, in English, in paper and in electronic versions, with reference to the obligations required by the EMP and other contractual documents. Those reports shall be subject to the approval of the Engineer and the Employer.

Furthermore, relevant units involved in implementation of the Contract shall be obliged to fulfil additional obligations related to monitoring and reporting of issues associated with the environmental protection, as determined in administrative decisions issued for the subject Contract (see: Chapter 3.5) and given in Appendix 1 and Appendix 2 to this EMP (Plan of mitigation measures, Plan of monitoring measures).

Monitoring at the works execution stage involves the preparation of summary reports on monitoring of nature by the Contractor, confirmed by the experts of the Contractor’s environmental team, approved by the Engineer’s environmental team, and submitted to RDOŚ by the PIU. Detailed contents of the report shall be defined by the Engineer (commencement report, periodical reports – monthly, ad-hoc, closure); it shall also determine the due dates.

The progress reporting system under the Project shall also base on monthly reports submitted by Contractors to the PIO through the Engineer, and upon Engineer’s monthly and quarterly reports. Monthly and quarterly reports on the EMP implementation (Contractor’s and Engineer’s) shall be prepared as a part of monthly reports or as a separate document.

The PIU shall supply the PCU with quarterly reports in the part referring to measures implemented by them. They shall contain a required set of information and descriptions allowing for the preparation of the Project’s quarterly report by the PCU. Furthermore, especially in the case of problems with the Works Contract implementation, the PCU shall expect the PIU to submit summaries and data in the monthly periods.

The following reporting procedures were established:

1. Reporting:

- a) Reports (monthly, quarterly, ad-hoc, final) shall be developed by the Contractor;
- b) Report review by the Engineer;
- c) Submission of the report to the Employer (for information);
- d) Provision of a report to RDOŚ and / or GDOŚ (only in a range resulting from administrative decisions issued on the performance stage, if they would require reporting of measures in question);
- e) Submission of a PIU’s quarterly report to the PCU;
- f) Final report on implementation of the EMP prepared by the Engineer (after verification by the PIU and by the PCU, submitted to the World Bank not later than 3 months after the completion of works).

2. Filing system:

- a) the Contractor: 1 copy of each report in an electronic version for 5 years from the date of the Works Contract completion;
- b) the Engineer: 1 copy of each report in an electronic version for 5 years from the date of the Works Contract completion;
- c) the Employer: 1 copy of each report in an electronic version for 5 years from the date of the Works Contract completion.

3. Evaluation:

- a) ongoing assessment of the outcomes of the planned measures implementation which arise from the EMP;
- b) ongoing analysis of documentation (Reports of the Contractor) by the Engineer;
- c) providing the Employer with reliable information on the course of the construction process, with special consideration of implementation of the measures limiting the adverse impact on the environment, and recommendations arising from environmental decisions;
- d) development and provision of quarterly reports to the World Bank by the PCU.

The following is planned:

- *ex-ante* evaluation: Report prior to the commencement of the Works Contract implementation (Engineer's Report);
- ongoing evaluation: Engineer's quarterly reports;
- *ex-post* evaluation:
 - Report upon the completion of the works (final reports on implementation of the EMP developed by the Contractor and by the Engineer);
 - EMP Report upon expiry of the Defects, Guarantee and Warranty Notification Period drawn up by the Contractor.

11 Source materials

1. Project Information Sheet for the contract titled "Construction of a pumping station for mobile pumps to drain the Lesisko complex", Cracow, March 2019.
2. Decision on environmental conditions dated July 27, 2020 (ref. no.: OO.420.4.4.2019.BM) for the contract titled "Construction of a pumping station for mobile pumps to drain the Lesisko complex".
3. MasterPlan for the Vistula River Basin. National Water Management Authority, Warsaw 2014.
4. Aquatic legal survey for the Contract 3A.6, Cracow 2020.
5. Feasibility Study for the project "Completion of the rehabilitation of the flood embankments of the Vistula River in Cracow: section 1 – the left embankment of the River Vistula from the Wandy Bridge to the Przewóz Barrage, together with the backwater embankments of the Dłubnia River; section 2 – the left embankment of the Vistula from the Przewóz barrage to Suchy Jar". SWECO 2018.
6. Report on the environment for Małopolskie Province in 2017, Provincial Inspectorate for Environmental Protection in Cracow, Cracow 2018.
7. Environmental Protection Program and Waste Management Plan for the City of Cracow remaining its element – plan for the years 2005-2007, including tasks done in 2004 and perspective for the years 2008-2011 – Volume I Environmental Protection Program.
8. World Bank Operational Policy OP 4.01 – Environmental Impact Assessment (<https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx#S3-2> [in the part titled: *Investment Project Financing / Environmental and Social Safeguard Policies*]).
9. Environmental and Social Management Framework, final document, April 2015 (http://odrapcu2019.odrapcu.pl/en/popdow_documents/).
10. Poland – Odra-Vistula Flood Management Project: environmental and social management framework (<http://documents.worldbank.org/curated/en/2015/04/24502899/poland-odra-vistula-flood-management-project-environmental-social-management-framework>).
11. Odra-Vistula Flood Management Project – Project Operations Manual, Wrocław 2015 (http://www.odrapcu.pl/doc/POM_PL.pdf)
12. Website: http://odrapcu2019.odrapcu.pl/en/popdow_documents/
13. Website: www.isok.gov.pl/
14. Acoustic maps for the City of Cracow (https://www.krakow.pl/encyklopedia_krakowa/13140,artykul,mapa_akustyczna_miasta_krakowa.html)
15. Geo-service GDOŚ (<http://geoserwis.gdos.gov.pl/mapy/>)

12 List of Drawings

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13 Appendices

Appendix 1. Plan of mitigation measures

Appendix 2. Plan of monitoring measures

Appendix 3. List of national legal acts related to environmental protection

Appendix 4. Decisions, resolutions, permits, notices

Appendix 4a. Decision of the Regional Director for Environmental Protection in Cracow dated July 27, 2020 on environmental conditions

Appendix 4b. Resolution of the Regional Director for Environmental Protection in Cracow dated August 06, 2020 on correction of obvious editorial mistakes in contents of the environmental decision dated July 27, 2020

Appendix 5. Map with location of the Contract

Appendix 6. Map with location of the Contract in reference to protected areas

Appendix 7. Map with location of the Contract in reference to areas under potential flood threat

Appendix 8. Map with location of the Contract in reference to areas excluded from the potential flood threat

Appendix 9. Map with location of the Contract in reference to natural habitats and protected species occurrence sites

Appendix 10. Map with location of the Contract's elements