



**ŚWIĘTOKRZYSKI BOARD OF
AMELIORATION AND HYDRAULIC
STRUCTURES IN KIELCE**



ODRA-VISTULA FLOOD MANAGEMENT PROJECT - 8524 PL

EMP - ENVIRONMENTAL MANAGEMENT PLAN

SUB-COMPONENT 3B: Protection of Sandomierz and Tarnobrzeg

Contract 3B.1

Flood protection Sandomierz

ENVIRONMENTAL CATEGORY B - IN ACCORDANCE WITH WB OP 4.01



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ENVIRONMENTAL MANAGEMENT PLAN

Sub-component 3B: Protection of Sandomierz and Tarnobrzeg

Contract 3B.1: Flood protection Sandomierz

This Environmental Management Plan applies to Contract 3B.1: Flood protection Sandomierz, covering six structures:

- 1) Flood protection within the mouth section of the Atramentówka River, construction of a new pumping station "Koćmierzów" and of a gravity-type dam lock in Koćmierzów (in the right embankment of the Vistula River) and of a channel draining water from the Atramentówka River to the pumping station,
- 2) Flood protection within the area of the Struga A watercourse together with an alteration and expansion of the pumping station "Nadbrzezie",
- 3) Expansion of the surrounding embankment protecting Glassworks and a Housing Estate against the flood waters in the town of Sandomierz together with an extension of the embankment of the Vistula River from the Lwowska Street to intersection of Koćmierzów embankment,
- 4) Protection the embankments of Koprzywianka River – left embankment in km 0+ 000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400,
- 5) Construction of the water pumping station in Szewce,
- 6) Expansion of the water pumping station in Zajeziórze.

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Project Implementation Office for Odra-Vistula Flood Management Project in Świętokrzyski Board of Amelioration and Hydraulic Structures in Kielce

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List of definitions and abbreviations used in EMP

Name	Description
Consultant/Engineer	Consultant/Engineer for Świętokrzyski Board of Amelioration and Hydraulic Structures in Kielce
Contract/Task	Odra-Vistula Flood Management Project. Contract 3B.1: Flood protection Sandomierz
Contractor	Company or public body executing Contract 3B.1: Flood protection Sandomierz
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan for the Contract 3B.1: Flood protection Sandomierz
Environmental decision	Decision on environmental conditions
ESMF	Environmental and Social Management Framework – for the Odra-Vistula Flood Management Project ¹
GDOŚ	General Directorate for Environmental Protection (<i>Generalna Dyrekcja Ochrony Środowiska</i>)
JCWP	Surface Water Body (<i>Jednolita część wód powierzchniowych</i>)
JCWpd	Groundwater Body (<i>Jednolita część wód podziemnych</i>)
OH&S	Occupational Health and Safety
PAD	<i>Project Appraisal Document</i> for the Odra-Vistula Flood Management Project ²
PCU	Project Coordination Unit
PIO	Project Implementation Office - An organisational unit allocated as part of PIU
PIU	Project Implementation Unit - Świętokrzyski Board of Amelioration and Hydraulic Structures in Kielce
PIU/Investor/ Employer	Świętokrzyski Board of Amelioration and Hydraulic Structures in Kielce
POM	Project Operations Manual
Project	Odra-Vistula Flood Management Project
RDOŚ	Regional Directorate for Environmental Protection (<i>Regionalna Dyrekcja Ochrony Środowiska</i>)
Roads authority	Organizational unit responsible for the management of public roads in accordance with the Act on public roads
SCI	Site of Community Importance

¹<http://documents.worldbank.org/curated/en/2015/04/24502899/poland-odra-vistula-flood-management-project-environmental-social-management-framework>;
http://www.odrapcu.pl/popdow_dokumenty.html

²<http://documents.worldbank.org/curated/en/2015/07/24763021/poland-odra-vistula-flood-management-project>

SHP	Safety and Health Protection Plan prepared in compliance with the Building Law Act of 7 July 1994
Structure	A material scope allocated in terms of functions, which constitutes a part of Contract 3B.1: Flood protection Sandomierz
ŚZMiUW	Świętokrzyski Board of Amelioration and Hydraulic Structures in Kielce (<i>Świętokrzyski Zarząd Melioracji i Urządzeń Wodnych w Kielcach</i>)
World Bank (WB)	International Bank for Reconstruction and Development

List of short names for legal acts used in EMP

Names of legal acts cited in the content of EMP are provided in a short form. Full names of legal acts are presented in the table below.

Name	Description
Bird Directive	European Parliament and Council Directive 2009/147/EC of 30 November 2009 on wild birds protection (EU Official Journal, L 288 of 6.11.2007)
<i>Environmental Impact Assessment Act</i>	Act of 3 October 2008 on providing information on environment and its protection, public participation in the environmental protection and Environmental Impact Assessments (consolidated text, Journal of Laws of 2016, item 353, as amended)
FWD	Framework Water Directive – European Parliament and Council Directive 2000/60/EC of 23 October 2000 establishing the frameworks for community activity within the scope of water policy (EU Official Journal, L 327 of 22.12.2000, p. 1, as amended)
Habitat Directive	Council Directive 92/43/EEC of 21 May 1992 on the protection of natural habitats and wild fauna and flora (EU Official Journal, L 206 of 22.7.1992, p. 7, as amended.)
NEPA	Act of 16 April 2004 on environmental protection (consolidated text, Journal of Laws of 2015, item 165, as amended)

EXECUTIVE SUMMARY

This document presents Environmental Management Plan for the Contract 3B.1 Flood protection Sandomierz, implemented within the Odra-Vistula Flood Management Project, co-financed by the International Bank for Reconstruction and Development, Council of Europe Development Bank, European Union Cohesion Fund and government budget.

This EMP includes the following elements:

- Abbreviated description of the Odra-Vistula Flood Management Project,
- Abbreviated description of the Contract to which this EMP is applicable,
- Institutional, legal and administrative conditions with listing of public administration bodies participating in issuing administrative decisions at the stage of preparing the Task to be implemented, valid acts of the Polish law regarding environmental protection, main stages of the EIA procedure, as well as presentation of the WB guidelines, and the current state of the EIA procedure for the Task covering Contract 3B.1,
- General specification of the status of respective environment elements in the Task implementation area and adjacent area,
- Summary evaluation of environmental impacts for the aforementioned elements of the environment, including impact of the Task on the environment in the context of the Water Framework Directive (FWD),
- Set of mitigation measures to be carried out by the Contractor and PIU at the Task implementation stage with reference to respective environmental elements. Mitigation measures are presented in the Table in Appendix No 1 to the EMP,
- Set of monitoring measures at the stage of preparation, works construction and exploitation of the Task. Monitoring measures are presented in the table in Appendix No 2 to EMP,
- Procedure and results of public consultations at the stage of EIA procedure, preparing the EMF for the Project and at the stage of development of this EMP (will be updated after completing the public consultations of this EMP),
- The organizational structure of the implementation of EMP, implementation schedule and the reporting procedure.

The Appendices to EMP also include copies of administrative decisions, referring to environmental protection, issued for particular structures implemented under the Task and graphic appendices – a location map of the planned Task (Appendix No 5), a map showing location of protected areas in relation to the Task area (Appendix No 6), a map

showing location of potential flood hazard areas (Appendix No 7) and areas excluded from potential flood hazard as a result of the Contract implementation (Appendix No 8).

The basis for this EMP for the Contract 3B.1 is as follows: EMF, ESMF, PAD, POM, operational policies of the World Bank, project information sheets, environmental decisions, and design documentation.

Characteristics of the Task

The Contract 3B.1 Flood protection Sandomierz comprises of six structures:

- Flood protection within the mouth section of the Atramentówka River, construction of a new pumping station "Koćmierzów" and of a gravity-type dam lock in Koćmierzów (on the right embankment of the Vistula River) and of a channel draining water from the Atramentówka River to the pumping station,
- Flood protection within the area of the Struga A watercourse together with an alteration and expansion of the pumping station "Nadbrzezie",
- Expansion of the surrounding embankment protecting Glassworks and a Housing Estate against the flood waters in the town of Sandomierz together with an extension of the embankment of the Vistula River from the Lwowska Street to intersection of Koćmierzów embankment,
- Protection the embankments of Koprzywnika River – left embankment in km 0+000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400,
- Construction of the water pumping station in Szewce,
- Expansion of the water pumping station in Zajeziorko,

Task shall be implemented in the area of the following communes: Sandomierz, Koprzywnica and Samborzec within Sandomierz District, Świętokrzyskie Province. Location of structures is shown in Appendix No 5 to EMP.

Institutional, legal and administrative conditions

The Task, with regard to its characteristics, expected potential environmental impacts, and location in respect of protected areas, is implemented in accordance with relevant national regulations on environmental protection.

The current condition of the environment elements in the surroundings of the Task

As a result of works related to identification of natural and cultural environment values conducted by a team of specialists during EMP procedure and previous works related to the preparation of relevant documentation and obtaining of administrative decisions, it has been determined that the area of the Task implementation is characterized by the following internal, local and regional conditions:

- occurrence of 5 types of natural habitats listed in Appendix I to the Habitat Directive,
- occurrence of 23 valuable and/or protected species of animals,
- the Task is implemented partially within the SCI Tarnobrzaska Vistula River Valley (Tarnobrzaska Dolina Wisły) PLH180049 and near the SCI Pieprzowe Mountains (Góry Pieprzowe) PLH260022.

Summary of the environmental impact assessment

The surface of the earth and landscape

Works conducted within the watercourses may result in moderate, in terms of scale and importance, transformations in the morphology of their beds. The courses covered by works under the Contract 3B.1 are characterized by strongly transformed morphology, within beds there are no elements typical of natural river beds, therefore, the impacts on the landscape in river valleys including the Vistula River valley, are minor.

In reference to the extension, strengthening and construction of flood embankments, the anticipated impacts are of local nature. Modernization of the existing embankments shall cause only periodic impacts on the surface of the earth and landscape - till the time of vegetation restoration on the embankment and in adjacent area

Climate

Due to a small spatial scope of the Task in the context of impact on climatic conditions and lack of significant interference in elements of the environment shaping the local climate, the Task does not cause adverse impacts in this respect.

Air quality

Emission of pollutants is limited to the phase of the Task implementation; it is short-term and reversible. The Task implementation does not result in important impacts on the air quality. At the operational stage of the Task, there shall be minor impacts related to the maintenance of the area (for instance mowing the surface of the embankments) or use of power generators in case of emergency. However, they shall not cause worsening of the air quality, the impact shall be periodic and not distinctive from urban emission surrounding the area of the Task.

Soil and ground

Impacts caused by modernization and construction of embankments do not stop flooding of regularly flooded areas (marshy areas, peat bogs, other areas valuable owing to soil-forming processes and resources of soil). As a result, there will be no important impacts on soil, including alluvial soil. Impact on the condition of soil is local, concerning mostly temporary occupation of grounds, vehicle and construction machine traffic, etc. It is insignificant in the context of greater segment of the Vistula River Valley. Permanent works construction sites cover small surface due to their linear structure.

Surface water

Works in canal bed will result in changes in parameters of flow, including impacts on the morphology of courses. Works will be implemented within strongly anthropogenically transformed courses, and consequently impacts are insignificant across the whole JCWP.

Works comprising of reconstruction of the existing elements of the flood protection system of Sandomierz do not generate significant changes in parameters of flow or negative changes in the morphology of courses. As a result, impacts (on the scale of particular JCWP) are moderate and do not cause hazards of failure to reach the established environmental goals.

Ground water

The Task does not cause adverse impacts on the condition of JCWPd. It is not planned to execute works which impact may relate to the groundwater level.

Acoustic climate

The Task will cause temporary acoustic impacts, limited to the Task implementation stage. Construction works in the acoustically protected areas and the immediate surroundings will be conducted between 6:00 a.m. - 10:00 p.m. The acoustic emission level after the end of the implementation does not change in the scope significant for acoustically protected areas (concerning only modernized and built pumping stations). It is possible that there will be vibro-acoustic impacts in case of one of the structures³. Relevant monitoring measures have been planned for this scope.

Nature

The Task will be implemented only in a short section within the Natura 2000 area. It applies to a section of the channel draining water from the outer-embankment zone directly after high water levels. According to the obtained administrative decisions, this action will not cause adverse impacts on the SCI Tarnobrzaska Vistula River Valley PLH180049. The structures implemented under the Contract 3B.1 relate mainly to the existing flood infrastructure and are implemented in areas with low or medium natural values (substantial transformation in the morphology of beds, strongly anthropogenically transformed).

At the stage of Task implementation, proper mitigating measures shall be taken together with current prevention of environmental threats, related e.g. to the presence in the impact zone of species of plants, fungi and protected animals presence of which was not earlier indicated in the area of the Task implementation

³ Expansion of the surrounding embankment protecting Glassworks and a Housing Estate against the flood waters in the town of Sandomierz together with an extension of the embankment of the Vistula River from the Lwowska Street to intersection of Koćmierzów embankment.

Cultural assets and tangible assets

The conducted works will not interfere directly in buildings and other structures listed in the commune register of monuments and/or in the register of monuments, in connection with this, at the stage of implementation and operation of the Task, there are no significant adverse impacts on this type of buildings or structures. Potentially adverse impacts may relate to some construction works in the neighbourhood of buildings.

Human health and safety

The Task does not generate essential threats to human health or safety. They may occur only in the event of an emergency and other random events, such as: a fire, contamination spillage, discovery of unexploded shells, danger for unauthorised persons access connected with the performance of construction works (e.g. excavations, traffic of machines and vehicles), flood risk, hazards connected with contagious diseases, etc. EMP specifies relevant conditions in the scope of preventing such events and mitigating of their possible results.

Mitigation measures

Chapter 6 of EMP and Appendix No 1 to EMP put together and describe mitigation measures aimed to limit or eliminate adverse impacts on particular components of the environment, as well as health and safety of people, monuments and tangible assets. The aforementioned mitigation measures contain both the conditions specified in the issued administrative decisions concerning aspects of environmental protection and conditions formulated at the stage of developing EMP.

Environmental monitoring

Chapter 7 of EMP and Appendix No 2 to EMP put together and describe monitoring measures relating to the verification of proper implementation of designed mitigation measures and monitoring of environmental impacts at the stage of preparation and implementation of the Task. The aforementioned monitoring measures contain both conditions specified in the issued administrative decisions concerning aspects of environmental protection and conditions formulated at the stage of developing EMP.

Social consultations

In Chapter 8 of EMP, there are described the results of public consultations at the stage of national EIA procedure and consultations of EMF for the Project. This section will be updated by a description of the public consultations of EMP after the public disclosure of the document.

Organizational structure of EMP implementation

In connection with the specified organizational conditions of the Task, being part of the Project, the structure of supervision over the implementation of EMP must correspond to the regulations of the Polish law, requirements of the WB and requirements of institutions responsible for the Project implementation. Correct implementation of the conditions specified in EMP covers actions of the following units:

- Odra-Vistula Flood Management Project Coordination Unit;
- Project Implementation Unit, as a local administration unit (ŚZMiUW in Kielce),
- The Engineer,
- The Contractor

A detailed list of tasks for particular units being part of the aforementioned structure is specified in Chapter 9 of EMP. Also other sections of EMP include entries concerning responsibility of particular entities participating in the Task implementation.

EMP implementation schedule and reporting procedures

Chapter 10 of EMP presents information about the schedule of implementation of EMP and reporting procedures.

Source materials

Chapter 11 of EMP contains basic source materials used in the works on this EMP.

1 INTRODUCTION

1.1 ODRA-VISTULA FLOOD MANAGEMENT PROJECT

Ensuring and improving flood protection is one of the most important factors determining sustainable and stable social and economic development of regions and countries. Odra-Vistula Flood Management Project assumes the implementation of the most urgent tasks in the field of flood protection within selected parts of river basins of the two largest Polish rivers, the Vistula River and the Odra River (Fig. 1).

The Project includes 3 development components covering improvement of flood protection within: Lower and Middle Odra River (Component 1), Kłodzko Valley, mountain and highland part of the catchment area of the Nysa Kłodzka River (Component 2) and the Upper Vistula River (Component 3).

Component 1 includes various activities carried out within the vast section of the Odra River with total length of approx. 440 km (unregulated section of the Odra River).

All the work necessary for implementation was divided into three Subcomponents:

- 1A – Flood protection of areas in Zachodniopomorskie Voivodeship,
- 1B – Flood protection on the Middle and Lower Odra,
- 1C – Flood protection of Słubice city.

Component 2 will be implemented within Kłodzko Valley, which covers mountain and highland part of the catchment area of the Nysa Kłodzka River.

Two Subcomponents will be implemented within this Component:

- 2A - Active protection (covers the construction of four polders),
- 2B - Passive protection (covers flood protection of areas located along four main rivers of Kłodzko Valley).

The aim of the Component 3 – Flood Protection of the Upper Vistula is the implementation of measures aiming at limiting threats in flood risk management on selected areas, within gradual raise of flood safety in the catchment area of the Upper Vistula River.

Component 3 is divided into the following Sub-components:

- Subcomponent 3A – Flood protection of Upper Vistula towns and Kraków,
- 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.

Within the Project, two more Components will be implemented, which do not include construction activities:

- Component 4 – Institutional Strengthening and Enhanced Forecasting,
- Component 5 – Project Management and Studies.

Description of the Project is to be found in the Environmental and Social Management Framework published on the websites of the World Bank⁴ and the Odra-Vistula Flood Management Project Coordination Unit⁵. Detailed Project description is also presented in PAD document.⁶

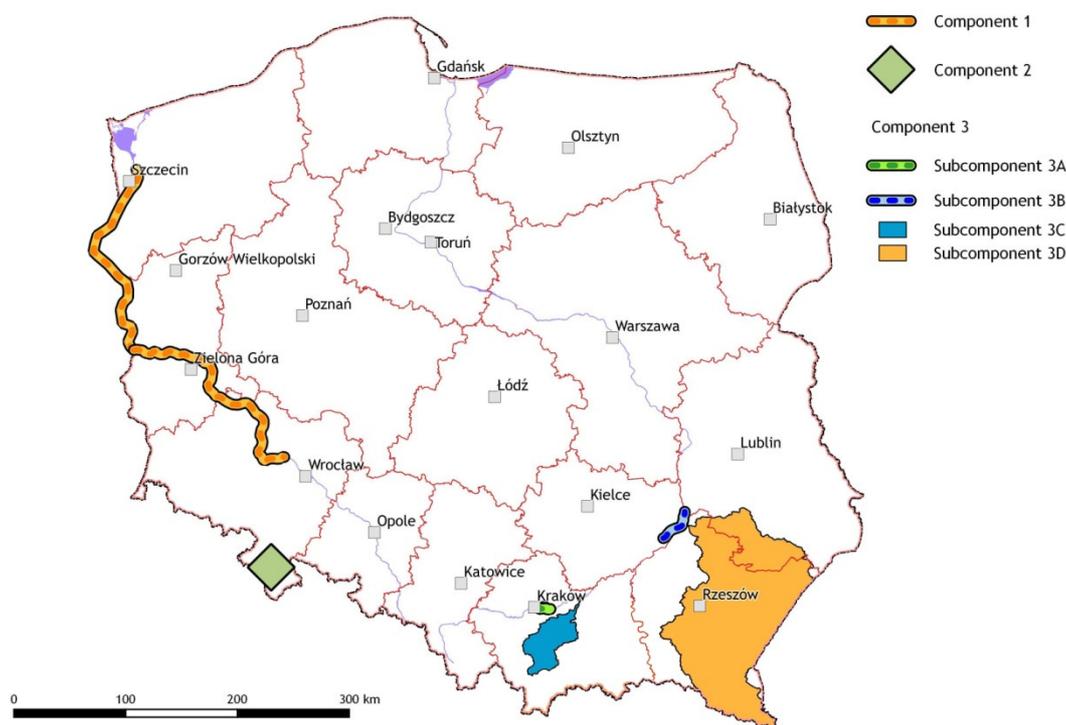


Fig.1 General location of work areas within the Project.

⁴<http://documents.worldbank.org/curated/en/2015/04/24502899/poland-odra-vistula-flood-management-project-environmental-social-management-framework>

⁵http://www.odrapcu.pl/popdow_dokumenty.html

⁶<http://documents.worldbank.org/curated/en/2015/07/24763021/poland-odra-vistula-flood-management-project>

2 TASKS DESCRIPTION

The Task included in this EMP will be carried out within the scope of the Odra Vistula Flood Management Project. The works are included in the Component 3 – Flood Protection of the Upper Vistula, Sub-component 3B - Protection of Sandomierz and Tarnobrzeg.

Contract – 3B.1 – Flood protection Sandomierz.

Świętokrzyski Board of Amelioration and Hydraulic Structures in Kielce, acting on behalf of Świętokrzyskie Province, is the Project Implementation Unit (PIU) of the Contract.

The Sandomierz Valley is a waterway node of the Vistula River and mouths of several important tributaries of Vistula River. The area of Sandomierz is protected by flood banks which condition and protective capacity were verified during the flood of 2010 (the largest in the history of this region) causing flooding of a right-bank part and significant amount of damage. The flood protection system requires improving and adjusting to the flow of great waters. Under the Contract 3B.1, it is planned to conduct sectional modernization of the embankment system along with necessary modernization of the system of pumping stations protecting the areas on the land side of the embankment during the runoff of great waters.

Contract 3B.1 is to: improve the flood protection of the right bank Sandomierz by draining the area within the forks of the Vistula River and the Trześniówka River; secure the Housing Estate and Glassworks against flooding from the Vistula River and Trześniówka River; secure the Koprzywnianka valley against flood; improve the protection against flooding and decrease the flood risk in the following villages Zajeziorko, Szewce and Sońniczany as well as in the neighbouring areas.

2.1 LOCATION OF THE TASK

The Contract 3B.1 includes implementation of six structures:

- 1) Flood protection in the mouth section of the Atramentówka River, construction of a new pumping station "Koćmierzów" and of a gravity-type dam lock in Koćmierzów (in the right embankment of the Vistula River) and of a channel draining water from the Atramentówka River to the pumping station - structure entirely located within Sandomierz City (right bank part of Sandomierz – Koćmierzów), Sandomierz Commune, Sandomierz District, Świętokrzyskie Province, on the right landside of the Vistula River at km 2+328 of the right Vistula embankment. Residential and utility buildings in Koćmierzów are at the distance of approx. 200 m east of the planned location of the pumping station. North of the planned structure there is Glass Works Pilkington in Sandomierz;
- 2) Flood protection within the area of the Struga A watercourse together with an alteration and expansion of the pumping station "Nadbrzezie" - structure is located within Sandomierz City, Sandomierz Commune and Sandomierz District,

Świętokrzyskie Province. The pumping station is located at km 0+664 of the left Trześniówka River embankment. The structure is located in the southern, right-bank part of Sandomierz. The storage and levelling reservoir along with the "Nadbrzezie" pumping station is located on a plot being property of the investor of the structure. The area along the Struga A bed section being rebuilt on the right hand side is restricted by an asphalt local road and by a short section of national road no. 77. On the left hand side at places there are residential buildings and farm buildings with accompanying fencing of plots adjacent to the bed being renovated;

- 3) Expansion of the surrounding embankment protecting Glassworks and a Housing Estate against the flood waters in the town of Sandomierz together with an extension of the embankment of the Vistula River from the Lwowska Street to intersection of Koćmierzów embankment - the structure entirely situated in the Sandomierz Commune. The structure will be constructed in the southern, right-bank part of Sandomierz. The site of investment is surrounded by industrial and agricultural areas as well as by housing development. The area covered by the investment does not change its nature and functions (embankments are already made).
- 4) Protection the embankments of the Koprzywianka River - left embankment in km 0+000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400 - the structure located in the Sandomierz Commune, Koprzywnica Commune, Samborzec Commune (all in the Sandomierz District). The Koprzywianka River valley is surrounded mainly by agricultural lands (farmlands and orchards). The investment area is intersected by county roads and local roads;
- 5) Construction of the water pumping station in Szewce - the structure situated near Szewce, within Samborzec Commune and Sandomierz District. The nearest buildings from the pumping station are within approx. 350 m, in Szewce and Sośniczany;
- 6) Expansion of the water pumping station in Zajeziórze - the structure entirely situated near Zajeziórze, within Samborzec Commune and Sandomierz District. The pump station is surrounded directly by agricultural land (orchards). The closest residential development is located approx. 600 m from the pump station.

General location of the work areas in relation to the surrounding environment is shown in the Fig. 2 below.

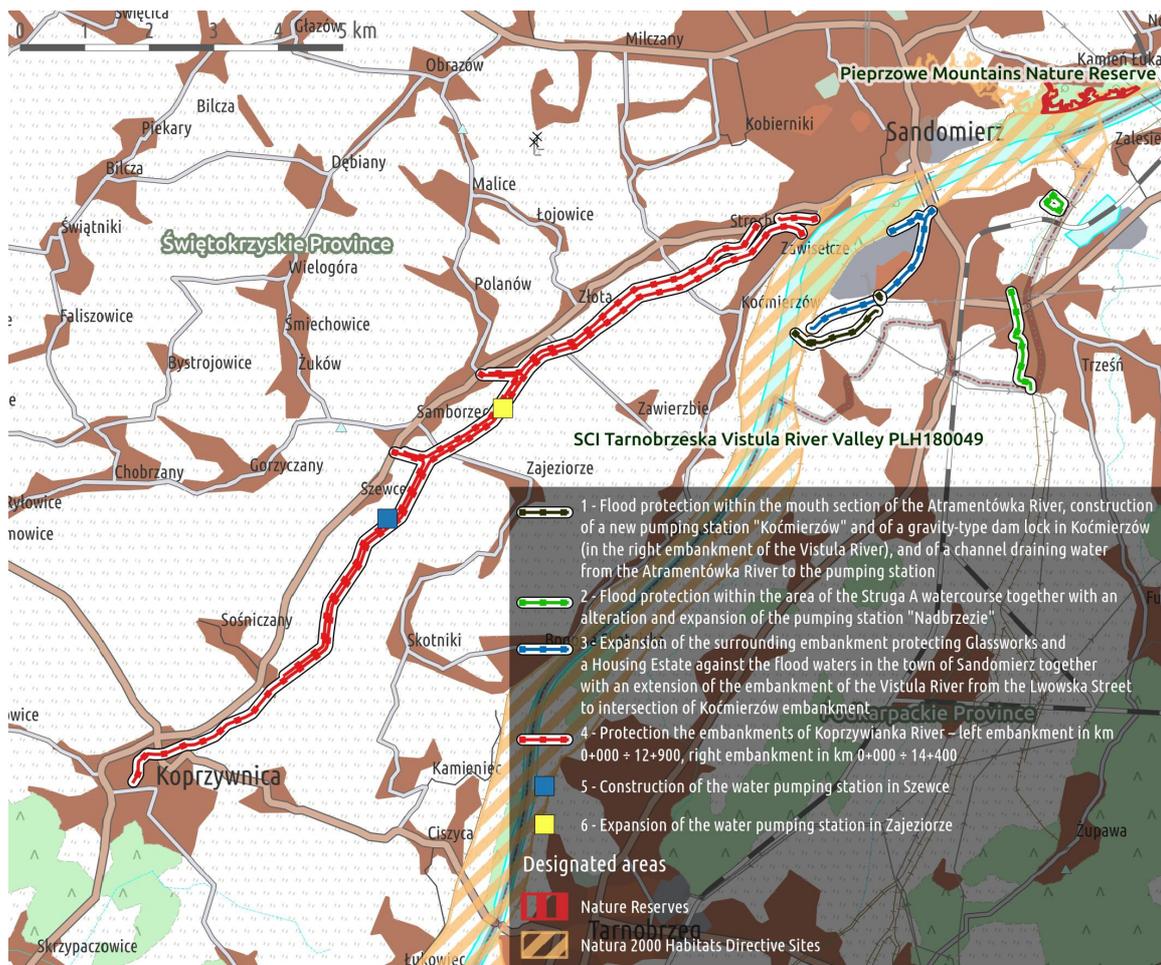


Fig. 1 Location of work implementation areas within the Project (the numbers on the map refer to section 2.2 below).

Detailed location of the work areas is shown in Appendix No 5 to EMP.

2.2 DETAILED TASK DESCRIPTION

The Contract 3B.1, Flood protection Sandomierz includes implementation of 6 structures:

- 1) Flood protection within the mouth section of the Atramentówka River, construction of a new pumping station "Koćmierzów" and of a gravity-type dam lock in Koćmierzów (in the right embankment of the Vistula River) and of a channel draining water from the Atramentówka River to the pumping station, which result in following works:
 - construction of "Koćmierzów" pump station with water reservoir,
 - construction of a channel leading water from Atramentówka River,
 - construction of a drainage channel into the Vistula River,
 - reconstruction of the existing embankment sluice in the embankment surrounding Pilkington Glass Factory,
 - rearrangement of Atramentówka River bed.

- 2) Flood protection within the area of the Struga A watercourse together with an alteration and expansion of the pumping station "Nadbrzezie", under which the works will be performed, including:
 - rebuilding of water reservoir and an embankment sluice,
 - modernization of Nadbrzezie pump station, together with construction of a septic tank and reconstruction of a channel discharging water from the pump station to Trześniówka River,
 - reconstruction of a drainage channel Struga A, reconstruction of culverts and exits within the channel route with insufficient capacity, strengthening of the channel bed.

- 3) Expansion of the surrounding embankment protecting Glass Factory and a Housing Property against the flood waters in the town of Sandomierz together with an extension of the embankment of the Vistula River from the Lwowska Street to intersection of Koćmierzów embankment, where works will be executed, including:
 - expansion of the existing embankment on the section of ca 2849 m along the Mostowa Street and Zarzecze in terms of its width and the height of its crown as well as its sealing along with the widening of embankment passage;
 - expansion of the existing embankment of the Vistula River on the section of 609 m in terms of its width and the height of its crown as well as its sealing;
 - construction of the flooding gates on the canal along with the reconstruction of the entry to the port,
 - reconstruction, expansion and construction of embankment structures and ground utilities networks colliding with the embankment structure.

- 4) Protection the embankments of Koprzywianka River – left embankment at km 0+000 ÷ 12+900, right embankment at km 0+000 ÷ 14+400, in which the works will be performed, including:
 - extension of the left and right flood bank of the Koprzywianka River within the section of the total length of 27.39 km (left bank of 12.9 km, right bank of 14.40 km),
 - construction of service roads.

The designed parameters of embankments:

- embankment crown width 3.0 - 4.0 m,
- water-side slope inclination: 1:2 - 1:2.25,
- outer scarp inclination 1:2.0 - 1:2.25,
- average height ca. 4 - 5 m.

- 5) Construction of the water pumping station in Szewce, where works will be executed, including:
 - cleaning, de-silting and widening the bottom of the discharging canal.
 - extension of the water reservoir,
 - demolition of the existing pump station building and construction of a new one with installment of new pump units,
 - construction of a new outlet,
 - construction of a septic tank.

- 6) Expansion of the water pumping station in Zajeziorko, where works will be executed, including:
 - extension of the water reservoir,
 - rebuilding of the pump station and installation of new pump units and replacement of pumped pipelines, reconstruction of the outlet and modernization of a discharge bed,
 - rebuilding of the embankment sluice gate, rebuilding of the outlet and discharge bed,
 - rebuilding of the parking site and access road to the pump station,
 - construction of a septic tank.

3 INSTITUTIONAL, LEGAL AND ADMINISTRATIVE CONDITIONS

3.1 INSTITUTIONS ENGAGED INTO THE TASK IMPLEMENTATION

Investor of the Task is ŚZMiUW, performing the tasks of Świętokrzyskie Province Marshal, acting on behalf of and to the benefit of the State Treasury performing tasks as part of the government administration. Additionally, at the stage of construction and operation, the implementation of the Task may require involving public administration bodies on the central and regional level. For the purposes of current coordination of the Project implementation by the ŚZMiUW, an organizational unit Odra-Vistula Flood Management Project Coordination Unit has been established.

3.2 APPLICABLE NATIONAL LEGISLATION CONCERNING THE ENVIRONMENT PROTECTION

According to the Polish law, the investment process with regards to environment protection, is subject to several acts and regulations. A list of selected, basic binding legal acts with regard to environmental protection is presented in Appendix No 3 to this EMP. The number and content of legal acts stated in Appendix No 3 may be changed along with amendments in binding regulations regarding environmental protection in Poland. The Contractor is also obliged, except for compliance with the principles specified in this EMP, to apply valid legal regulations regarding environmental protection.

3.3 EIA PROCEDURE IN POLAND

The description of the EIA procedure in Polish legislation is included in the ESMF published on the i.a. web sites of the WB⁷ and the Odra-Vistula Flood Management Project Coordination Unit⁸.

3.4 WORLD BANK REQUIREMENTS

The Task under consideration will be co-financed by the World Bank. For this reason, the conditions of its implementation with regard to environmental protection must be consistent with the following policies of the World Bank:

- OP 4.01 - on the environmental impact assessment,
- OP 4.04 - on natural habitats,

⁷ <http://documents.worldbank.org/curated/en/2015/04/24502899/poland-odra-vistula-flood-management-project-environmental-social-management-framework>

⁸ http://www.odrapcu.pl/popdow_dokumenty.html

- OP/BP 4.11 - on the physical cultural resources.

Details of WB policies are included in the prepared ESMF, published on the i.a. web sites of the World Bank⁹ and the Odra-Vistula Flood Management Project Coordination Unit¹⁰.

3.5 CURRENT STATE OF EIA PROCEDURES FOR THE TASK

The Task is classified as group II of the investments which are most likely to significantly affect the environment in accordance with the classification of the Regulation of the Council of Ministers of 9th November 2010 on investment projects that may significantly affect the environment.

For different structures, the following decisions on environmental conditions were issued:

- 1) Flood protection within the mouth section of the Atramentówka River, construction of a new pumping station "Koćmierzów" and of a gravity-type dam lock in Koćmierzów (in the right embankment of the Vistula River) and of a channel draining water from the Atramentówka River to the pumping station - structure entirely situated in Sandomierz Commune.
 - Decision of the Regional Director for Environmental Protection in Kielce of 19th July 2013 on the environmental conditions of the project entitled „Flood control of the right-bank part of Sandomierz – land drainage in the fork of the Vistula River and Trześniówka River. Task 1: Flood protection within the mouth section of the Atramentówka River, construction of a new pumping station "Koćmierzów" and of a gravity-type dam lock in Koćmierzów (in the right embankment of the Vistula River) and of a channel draining water from the Atramentówka River to the pumping station" (ref. no. WOO-I.4233.2.2013.AM.11);
- 2) Flood protection within the area of the Struga A watercourse together with an alteration and expansion of the pumping station "Nadbrzezie" - the structure entirely situated in Sandomierz Commune.
 - Decision of the Regional Director for Environmental Protection in Kielce of 18th October 2013 on the environmental conditions of the project entitled „Flood control of the right-bank part of Sandomierz – land drainage in the fork of the Vistula River and Trześniówka River. Task 2: Flood protection within the area of the Struga A watercourse together with an alteration and expansion of the pumping station "Nadbrzezie" (ref. no. WOO-I.4233.3.2013.AM.20);
- 3) Expansion of the surrounding embankment protecting Glass Factory and a Housing Estate against the flood waters in the town of Sandomierz together with an extension of the embankment of the Vistula River from the Lwowska Street to

⁹ <http://documents.worldbank.org/curated/en/2015/04/24502899/poland-odra-vistula-flood-management-project-environmental-social-management-framework>

¹⁰ http://www.odrapcu.pl/popdow_dokumenty.html

intersection of Koćmierzów embankment - the structure entirely situated in Sandomierz Commune;

- Decision of the Regional Director for Environmental Protection in Kielce of 12th December 2014 on the environmental conditions of the project entitled "Expansion of the surrounding embankment protecting Glass Factory and a Housing Estate against the flood waters in the town of Sandomierz along with the concept of the protection of Port" (Ref. no. WOO-I.4233.5.2014.KT.10);
- 4) Protection the embankments of the Koprzywianka River - left embankment at km 0+000 ÷ 12+900, right embankment at km 0+000 ÷ 14+400 - the structure located within Sandomierz Commune and Samborzec Commune, Sandomierz District
- Decision of the Regional Director for Environmental Protection in Kielce of 25th October 2013 on the environmental conditions of the project entitled "Protection of Koprzywianka River embankments - left at km 0+000 ÷ 12+900, right at km 0+000 ÷ 14+400" (ref. no. WOO-I.4233.1.2013.AM.20);
- 5) Construction of the water pumping station in Szewce - the structure entirely situated in Samborzec Commune, Sandomierz District
- Decision of the Regional Director for Environmental Protection in Kielce of 30th June 2014 on the environmental conditions of the project entitled "Construction of the water pumping station in Szewce" Samborzec (ref. no. WOO-I.4233.3.2014.KT.8);
- 6) Expansion of the water pumping station in Zajeziórze - the structure entirely situated in Samborzec Commune
- Decision of the Regional Director for Environmental Protection in Kielce of 30th June 2014 on the environmental conditions of the project entitled "Expansion of the water pumping station in Zajeziórze" Samborzec (ref. no. WOO-I.4233.4.2014.MM.6)

Copies of the above decisions can be found in Appendix No 4.

4 DESCRIPTION OF THE ENVIRONMENT ELEMENTS

4.1 LAND AND LANDSCAPE

According to the physical-geographical division of Poland, the area covered by works under the Contract 3B.1 is located on the boundary of the Sandomierz Upland, within the mesoregion Vistula Lowland being the north-western part of the Sandomierz Valley, on the borderland of Małopolska Upland and Northern Podkarpacie (Kondracki 2004).

The Sandomierz Upland is an eastern part of the Kielce and Sandomierz Upland and the Świętokrzyskie Mountains. The landscape of the upland is characterized by varied morphology. Owing to the geologic structure, its surface is undergoing strong erosion, loess gorges and erosive valleys are typical. The area rises 200 - 300 m above sea level. The upland is cut by valleys of the left-bank tributaries of the Vistula River: Koprzywianka River and Opatówka River.

The Vistula Lowland creates the 8-12 km broad Vistula River Valley, and is an extensive tectonic reduction that is filled out with river deposits, with thickness reaching a dozen or so meters. Within its area, several levels of flood and flood-free terraces were formed. The lowland surface is hardly varied, it rises 143-148 m above sea level. On the section where the Task will be implemented, the Vistula River is a lowland river. Its bed was embanked and regulated. The zone on the land side of the embankment is meliorated and mostly used for agriculture.

4.2 CLIMATE

Sandomierz is situated in the latitude of moderate climate – transitional type.

The dominant wind direction is south-western and western. The average annual air temperature in Sandomierz is 8°C. The highest air temperature annually is recorded in July and the lowest temperature in January.

4.3 AIR QUALITY

The most significant issue in the overall balance of pollution sources in municipal areas are emissions of industrial and transport pollutants.

The main sources of pollutants in the region of Sandomierz are:

- pollutant emissions related to vehicle traffic and agricultural equipment;
- local (Glass Factory, Cement Factory) and neighboring industrial centers: pollutants from Staszów, Ożarów, Stalowa Wola, Tarnobrzeg and Połaniec;
- emissions of gases and dusts from individual home heating systems constituting a central heat supply of thermal energy.

4.4 SOIL AND LAND

The area of implementation of Task 3B.1 features mainly alluvial soil, characterized by a great diversity, peat and podzol soil.

Podzol soil and pseudo-podzol soil are present, first of all, in fluvioglacial sands, under coniferous vegetation. A characteristic feature of this soil is the presence of the so-called illuvial level (erosion) and acidic reaction. These are hardly fertile soils.

Brown earth soil formed under deciduous forests and mixed forests is present within high plain areas and on higher flood-free terraces. In the areas of presence of loess, there is black soil. Alluvial soil dominates within the tributaries of the Vistula River. In zones of cavities and gutters of oxbow lakes, there is organic soil such as peat, peat and sludge, sludge.

Within the structure of soil valuation in the area of Sandomierz, the greatest share belongs to 1st, 2nd and 3rd class soils: 1st class soils cover the area of 354 ha (which accounts for 21% of the area of Sandomierz); 2nd class soils - 548 ha (which accounts for 33% of the area of Sandomierz); 3rd class soils 531 ha (which accounts for 32% of the area of Sandomierz); 4th class soil covers 202 ha (which accounts for 12% of the area of Sandomierz), while 5th and 6th class soil covers together 24 ha (which accounts for 2% of the area of Sandomierz) (Environmental Protection Program for the Commune of Sandomierz for the Years 2009 – 2016).

4.5 SURFACE WATER

The task is located in the river basin of the Upper Vistula River. Within the Vistula Valley section under consideration, there are mostly right-bank tributaries which are: Wisłoka River, San River, Łęg River and Trześniówka River. Left-bank tributaries are Koprzywianka River and Opatówka River.

Smaller courses as e.g.: Breń River and Trześniówka River are separated from the current bottom of the Vistula River Valley by zones of eroded terraces levels covered with aeolian sands.

The bed of the Upper Vistula River, originally meandering, was regulated and embanked almost across the whole section and is currently characterized by a slope from 0.36‰ to 0.26‰ in the Sandomierz Valley. The canal width is 80-300 m. The result of regulatory works was a considerable reduction in its width and growth in slope, which both result in an increased bottom erosion and tendency to lower the river bed.

The Task includes the following Surface Water Body (JCWP):

- **JCWP Vistula River from Wisłoka River to San River**

Water region	Upper Vistula
Water category	great lowland river (21).
Status	strongly changed part of waters
Current water condition	bad
JCWP risk of failure to achieve environmental objectives	yes
Derogations	4(4)-3 time derogations due to salinity and impact of after-mine waters

- **JCWP Koprzywianka River from Modlibórka River to the mouth of the river**

Water region	Upper Vistula
Water category	lowland sand and clay river (19)
Status	strongly changed part of waters
Current water condition	weak
JCWP risk of failure to achieve environmental objectives	yes
Derogations	4(4)-1 temporary derogations owing to the presence of the lengthwise and transverse buildings and the flood protection function performed by them

- **JCWP Sielec area tributary**

Water region	Upper Vistula
Water category	course in a valley of a great lowland river (26)
Status	natural part of waters
Current water condition	bad
JCWP risk of failure to achieve environmental objectives	yes
Derogations	4(4)-3 derogations due to salinity and impact of after-mine waters

- **JCWP Trześniówka River from Karolówka River to the mouth of the river**

Water region	Upper Vistula
Water category	lowland sand and clay river: 19
Status	strongly changed part of waters
Current water condition	bad

JCWP risk of failure to achieve environmental objectives	yes
Derogations	-

The description of biological elements in waters, with breakdown into abiotic types, is presented below.

In the works construction area, presence of 3 types of abiotic rivers was distinguished. Each is characterized by different group of fish:

- **TYPE NO. 21 - GREAT LOWLAND RIVER**

For non-transformed sections of abiotic rivers 21 - great lowland river, the presence of various bed forms is characteristic, in particular; deep gutters with hard, sand or gravel bottom, sandy shoals and islands with different degree of durability and overgrowing vegetation, side arms and marginal lakes downstream islands. There is also a broad flood lowland, with many oxbow lakes with different degree of connection with the river. Water vegetation of oxbow lakes, marginal lakes and side arms of the river proves high evaluation of the ecological condition. The investment covers the lower section of the region of the Upper Vistula River in which the river has a transitional character between the land of the common barbel and the land of the bream. Across the discussed section of the Vistula River, due to partially regulated character of the river bed, the prevailing fish species are related to the land of bream. This land covers middle and lower sections of larger rivers, with predominantly sand or muddy bottom, slower stream and warm or moderately warm water.

- **TYPE NO. 19 - LOWLAND SAND AND CLAY RIVER**

The Task includes Surface Water Body of 3 rivers belonging to type 19: Koprzywianka River, Łęg River and Trześniówka River. These are rivers with moderate stream and clayey and sand bottom, with moderately warm or medium oxygenated water. The Flora and fauna of these environments are related to hard, clayey bottom substrate. A substantial habitat-forming role is performed by wood rubble that ensures convenient hiding places or feeding and reproduction places of most taxa.

- **TYPE 26. COURSE IN A VALLEY OF A GREAT LOWLAND RIVER**

These are rivers with free stream and muddy and sand bottom, with warm, poorly oxygenated water. They are populated by macro-invertebrates adapted for moderate speed of stream and quite high water temperatures indicating low oxygen requirements. Flora and fauna of these environments are related to muddy and sand bottom substrate: a substantial habitat-forming role is performed by macrophytes, including plants with floating leaves and wood rubble that provide convenient hiding places and places for feeding and reproduction of most taxa. Rivers of this type belong to the land of the bream and are populated by ecological groups of limnophilic fish or fish without preferences with regard to speed of stream, with predominance of phitophilic and psamophilic species.

4.6 GROUNDWATER

The Task 3B.1 Flood protection Sandomierz is located in the region of the Upper Vistula River, within two JCWPd. The main utility water-bearing level is in Quaternary deposits. The deposits of the Miocene and older feature water with increased mineralization. The main drainage zone are river valleys: of the Vistula River and its tributaries. The water table has infiltration character. 1st water-bearing level waters are vulnerable to contamination. The qualitative condition of groundwater was largely determined by the open-pit extraction of sulphur (Machów mine). The area is within Main Underground Reservoir 425 Reservoir Dębica- Stalowa Wola- Rzeszów.

4.7 ACOUSTIC CLIMATE

The region of Sandomierz and the area of the Task may be divided into several diverse regions. This division results from the form and intensity of land development and degree of environmental impact of human activities:

- areas of suburban housing development - it covers other neighborhoods and housing estates of Sandomierz, among others, Nadbrzezie, Ostrówek, Vitrum Housing Estate, Chwałki and Gołębice;
- areas of industrial development - it covers the area of Pilkington Polska Sp. z o.o. Glass Factory and the site of the railway station. In the direct neighborhood of the Glass Factory there is K.K. Baczyński housing estate of blocks of flats;
- areas of rural and agricultural development - they cover the remaining part of Sandomierz Commune and Samborzec Commune.

In the areas of urban and suburban development, the main sources of point acoustic impacts are events typical of the functioning of an agglomeration. In the period from spring to autumn, Sandomierz is frequently visited by tourists, mainly on days free from work. As a result, short-term increased impacts, associated with concerts and cultural events taking place in the public space, can occur.

In the areas of industrial development two point sources of noise can be indicated: Pilkington Polska Sp. z o.o. Glass Factory in the neighborhood of Zarzekowice and industrial areas in the neighborhood of the Sandomierz railway station, including, among others:

- fodder manufacturing plant DOSSCHE Sp. z o.o.;
- building depot along with cement plant Telwolt-Beton Sp. z o.o.

In the case of the Glass Factory in the neighbourhood of Zarzekowice, noise emission is connected with operation of cooling devices and transport operations, including loading/unloading of products and raw materials. Other technological and production processes take place inside the buildings and do not affect the acoustic conditions. A similar situation takes place in the fodder manufacturing plant and in the concrete elements manufacturing plant: the processes generating noise are vehicle traffic connected with deliveries of raw materials and transport of ready-made products.

The areas of rural and agricultural buildings in the area of the Task within Sandomierz Commune are a combination of detached buildings and utility buildings located mainly in the system of streets with agricultural land and meadows and pastures. On the other hand, the area of the Task within Samobrzec Commune (the region of the Koprzywianka River) is dominated by agricultural land. The villages of Andruszkowice, Samborzec and the city of Koprzywnica make larger concentrations of buildings. The sources of increased acoustic emission are agricultural works and operation of buildings alone. These impacts are short-term and are not associated with significant impact on the environment and people.

An important source of acoustic impacts in the area of Sandomierz is road transport. There are two national roads and two provincial roads in the area of the Task:

- DK77 (national road no. 77): Lipnik – Sandomierz – Stalowa Wola – Przemyśl;
- DK79 (national road no. 79): Warszawa – Sandomierz – Kraków – Bytom;
- DW723 (provincial road no. 723): Sandomierz – Province boundary - Tarnobrzeg;
- DW777: Sandomierz (provincial road no. 777) – Zawichost - Maruszów.

4.8 NATURE

4.8.1 PROTECTED NATURAL HABITATS AND PROTECTED SPECIES OF PLANTS, FUNGI AND ANIMALS

NATURAL HABITATS

The direct area of the Task implementation features 5 types of natural habitats:

- Oxbow lakes and natural eutrophic water bodies with communities with *Nympheion*, *Potamion* 3150,
- Mountain tall herb communities and riverside tall herb communities 6430,
- Extensively used lowland and mountain fresh meadows (*Arrhenatherion*) 6510,
- Alluvial meadows of river valleys of the *Cnidion dubii* 6440,
- Alluvial forests with *Alnus glutinosa* and *Fraxinus exelcior* (*Salicetum albo-fragilis*, *Populetum albae*, *Alnenion glutinoso-incanae*, *Cardamino-Alnetum glutinosae*)¹¹ 91E0.

FLORA

In the area of the Task implementation and its direct surrounding no protected plant species have been confirmed.

¹¹ the so-called priority habitat, particular in terms of protection

FAUNA

Table No. 1: Valuable animal species in the location and in the surrounding of the Task implementation area

Species	Protection status [Ch - protected under Polish law, I DP - species listed in I App. Birds directive. IIDS - species listed in Appendix II of Habitats Directive]	The area of occurrence - structure
European Weatherfish	Ch, II DS	2
European fire-bellied toad	Ch, II DS	1, 4
Common toad	Ch	1, 2, 4
European green toad	Ch	4
Common frog	Ch	1, 2, 3, 4, 5, 6
Marsh frog	Ch	4
Sand lizard	Ch	1, 2, 3, 4, 5, 6
Grass snake	Ch	1, 2, 3, 4, 6
Common whitethroat	Ch	1, 2
Northern lapwing	Ch	1, 2
Whinchat	Ch	1, 2
Common tern	Ch, I DP	1
Skylark	Ch	1, 2, 3, 4, 5, 6
Thrush nightingale	Ch	1, 2, 3, 4
Great reed warbler	Ch	1, 2, 3, 4
Yellowhammer	Ch	1, 2, 4
Western yellow wagtail	Ch	1, 3, 4
Barn swallow	Ch	2
Western marsh harrier	Ch, I DP	2
Oriole	Ch	1, 4
Red-backed shrike	Ch, I DP	1, 2, 3, 4
Eurasian beaver	Ch, II DS	1, 3, 4, 5, 6
Otter	Ch, II DS	1, 3, 4

4.8.2 PROTECTED AREAS

Pieprzowe Mountains Nature Reserve

The Pieprzowe Mountains Nature Reserve was established in 1979. This is a steppe reserve, goal of which is to protect xerothermic grassland and bushes with interesting fauna of insects and places with exposed Cambrian shale clays.

Approx. 3-km-long section of the borderline of the Upland of Sandomierz between the villages of Kamień Nowy and Kamień Plebański form the so-called Pieprzowe Mountains (situated partially within the administrative area of the city of Sandomierz) - reaching the height of approximately 199 m above sea level. In terms of geological structure, the Pieprzowe Mountains are an eastern, boundary part of the Świętokrzyskie Mountains. They are built of Cambrian rocks of about 500 millions of years, termed as shales and quartzites with a characteristic, brown-grey colour. The slopes are covered with a layer of loess, with maintained relics of steppe flora, mainly grass - *Stipa capillata* and *Bothriochloa ischaemum*, as well as dwarf cherry and very numerous population of French rose. The Reserve is located beyond the direct area of works executed under the Task. The Reserve lies within SCI Pieprzowe Mountains PLH260022.

SCI Tarnobrzaska Vistula River Valley PLH180049¹²

The Site includes a section of the Vistula River, located in the Sandomierz Valley between the mouth of the Wisłoka River and Sandomierz. The Site of Community Importance includes the Vistula River bed and directly adjacent areas of the inter-embankment zone. The main qualities of the Site are the natural river bed, numerous and well preserved old beds with stands of protected species, flood meadows and willows and marshy forests. The section of the Vistula River Valley covered by the Natura 2000 area is also an ecological corridor. Object 1 Flood protection in the mouth section of the Atramentówka River, construction of a new pumping station "Koćmierzów" and of a gravity-type dam lock in Koćmierzów (in the right embankment of the Vistula River) and of a channel draining water from the Atramentówka River to the pumping station, partially will be situated within SCI Tarnobrzaska Vistula River Valley PLH180049. Detailed location of the Task on the background of protected areas is shown in Appendix 6 of EMP.

¹² Special Protection Area of Habitats Natura 2000 - name Site of Community Importance is used in connection with lack of Polish legal act establishing "habitat" Natura 2000 areas

Table No. 2: Objects of protection of the SCI Tarnobrzaska Vistula River Valley PLH180049¹³

Name	Code	Area in ha/population	General assessment of importance of the Site to preserve the habitat is included in SDF
Oxbow lakes and natural eutrophic water bodies with communities with <i>Nympheion, Potamion</i>	3150	81,6	A
Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation	3270	246,02	B
Iluvial meadows of river valleys of the <i>Cnidion dubii</i>	6440	444,54	A
Extensively used lowland and mountain fresh meadows (Arrhenatherion)	6510	586,63	A
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus exelcior</i>	91E0	1002,34	A
Asp <i>Aspius aspius</i>	1130	C	B
Eurasian beaver <i>Castor fiber</i>	1337	30	B
<i>Lutra Lutra lutra</i>	1355	10	C
Large copper <i>Lycaena dispar</i>	1060	P (present)	C
Dusky large blue <i>Maculinea nausithous</i>	6179	P (present)	C

Explanations of symbols used in the table: A - excellent, B - good, C – significant

¹³ all Natura 2000 sites have their unique code which identifies site despite translation of its name. First two letter refer to the country name, third to the type of the site (Special Protection Area or Special Area of Conservation), fourth and fifth refers to Province and rest is number of the site in certain Province

SCI Pieprzowe Mountains PLH260022¹⁴

The SCI covers completely the Pieprzowe Mountains Nature Reserve (the above described), oxbow lake at the foot of the bank of the Vistula River Valley and a fragment of the valley slope. The Site has a varied land form, is created by one of the oldest orogenic belts in Poland, dated for a period from before 500 million years.

The main object of protection of the Site is preservation of very well formed xerothermic turfs with *Stipa capillata* and *Bothriochloa ischaemum* and xerothermic bushes with species of roses, blackthorn, European dwarf cherry, hawthorn, Japanese barberry and other species. One of the special qualities of the Site is presence of rare species of wild roses, and some forms were described for the first time in the Pieprzowe Mountains. The Site is also a place of numerous presence of other rare and protected plant species. The object of protection is also species related to old and dying trees - hermit beetle. The SCI Pieprzowe Mountains PLH260022 is located beyond the direct area of works executed under the Task.

Table No. 3: Objects of protection of the SCI Pieprzowe Mountains PLH260022

Name	Code	Area in ha/population	General assessment of importance of the Site to preserve the habitat is included in SDF
Oxbow lakes and natural eutrophic water reservoirs with communities with <i>Nymphaeion</i> , <i>Potamion</i>	3150	1,69	C
Xerothermic turfs (Festuco-Brometea and thermophilic Asplenion septentrionalis-Festucion pallentis)	6210	25,18	B
Mountain tall herb communities (<i>Adenostylin alliariae</i>) and riverside tall herb communities (<i>Convolvuletalia sepium</i>)	6430	0,77	C
Willow-poplar gallery forests, alder and ash	91E0	1002,34	A

¹⁴ Special Protection Area of Habitats Natura 2000 - name Site of Community Importance is used in connection with lack of Polish legal act establishing "habitat" Natura 2000 areas

Hermit beetle <i>Osmoderma eremita</i>	1084	P (present)	C
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Explanations of symbols used in the table: A - excellent, B - good, C - significant, P - present.

4.9 CULTURAL LANDSCAPE AND MONUMENTS

The region of Sandomierz and the city itself are characterized by a great number of real estate monuments found in the register of monuments and/or communal registers of monuments. The area of special value is the Old Town in Sandomierz. The whole Old Town has been covered by conservation protection (entry into the register of monuments) already in 1947 as the so-called ancient city. In the subsequent years of the post-war period, protection of this part of Sandomierz was extended until 1984 when the Old Town was acknowledged as an urban-architectural and landscape complex (the city of 13th - 19th century). Within this complex, it is possible to distinguish several structures or groups of structures with special values owing to the state of preservation of historical structure and serving as an example of past times buildings. There are following cultural assets:

- cathedral church complex, including the Basilica of the Birth of the Holy Virgin Mary - Gothic hall church dating back to the 14th century, bell tower (18th century) and fencing (reg. no. A.720/1-3);
- St. Paul's church (15th-18th century) including: church of St. Paul's Conversion, bell tower, fencing with a gate (reg. no. A.723/1-3);
- monastic complex of Missionary Sisters of St. Benedict (presently spiritual sanctuary) from the 17th - 18th century, which includes: the church of St. Michael the Archangel, bell tower, monastery, wicket of monastery;
- monastic complex of the Dominican Order, including: the church of St. Jacob (1226-1250), bell tower, remnants of monastery and monastic garden along with landscape and trees (reg. no. A.725/1-5);
- "Collegium Gostomianum" Jesuit College of 17th - 17th century (reg. no. A.728);
- castle: 14th-18th century, modifications 19th-20th century (reg. no. A.737);
- remnants of municipal fortifications, partially incorporated in the later urban buildings (reg. no. A.738/1-5);
- town hall: 14th - 17th century (reg. no. A.740);
- "Jan Długosz House" complex - a tenement house from the 15th century, 17th century modifications, the complex includes the so-called "Długosz House" - a tenement house founded by Jan Długosz along with a yard and a garden reg. no. A.741/1-3);
- synagogue from the 18th century, 19th-century modifications. (reg. no. A.735).

In addition, protection will cover tenement houses surrounding the Market Square and the entire town planning of the Old Town. Beyond the area of the urban-architectural and landscape complex, an entry to the register of monuments covers, among others, two cemeteries: military cemetery of Soviet soldiers (reg. no. A.733) and Jewish cemetery at Sucha Street (reg. no. A.732).

In the neighboring commune of Sandomierz, Gorzyce (Podkarpackie Province), in the village of Trześć (the area of the structure flood protection within the Struga A course along with reconstruction and expansion of the "Nadbrzezie" pumping station) a Roman Catholic church from the 19th century is located along with a complex of buildings, manor and granary from the 19th century, constituting residue of the farm of the Tarnowski count. In addition, near the healthcare centre "Eskulap" there are remnants of the cemetery from the Stone Age, including a kurgan.

In the area next to the structure Protection of embankments of the Koprzywianka River - left embankment in km 0 +000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400 there are sacred monuments and urban and landscape complexes. In the area of the village of Złota there is an archaeological site, the so-called Kwacala Kurgan with four tombs from the period of the so-called Mierzanowice culture. In the town of Samborzec, the so-called conservator's protection covers the parish church of St. Trinity from the 17th century, erected in the 13th century, and the oldest part of the parish cemetery. At a distance of approx. 2.5 km from the village of Szewce (Construction of the water pumping station in Szewce), in the village of Skotniki a manor - park complexes is situated: it includes a baroque defensive manor house from the 17th-18th century, surrounded by a park with remnants of a moat (reg. no. A.718/1-3). In addition, the village features also a Gothic church of St. John the Baptist dating back to the 14th century, rebuilt in the 18th and 19th century (reg. no. A.716).

Located within the final section of the modernized embankments of the Koprzywianka River, the city of Koprzywnica is partially covered by protection regarding the urban-landscape system - market square with nearby streets along with the Church of Our Lady of the Rosary of 1470 r. In addition, the north-western part of the city features a complex of the former abbey of the Cistercians, which includes: church (10th - 13th century), monastic building along with an abbatial manor house and a surrounding garden.

4.10 POPULATION

The structures implemented within the Task are located in the Sandomierz Commune, Koprzywnica Commune and Samborzec Commune, in the Sandomierz District, Świętokrzyskie Province.

The Contract implementation will provide protection against flood for the city of Sandomierz, inhabited by approx. 25 000 people. The whole Sandomierz District has nearly 80 000 inhabitants (Central Statistical Office (GUS) 2015).

Villages located in close proximity to the works construction sites within Task are:

- Koćmierzów inhabited by approx. 230 people (Sandomierz District, Samborzec Commune),
- Szewce inhabited by approx. 140 people (Sandomierz District, Samborzec District),
- Sońniczany inhabited by approx. 410 people (Sandomierz District, Koprzywnica Commune)¹⁵,
- Zajeziórze inhabited by approx. 540 people (Sandomierz District, Samborzec Commune)¹⁶.

¹⁵Public Information Bulletin

<http://bip.koprzywnica.asi.pl/pls/koprzywnica/dokumenty/F2710/DANE%20STATYSTYCZNE%20-%20Kop.doc>

¹⁶ Restoration Plan for Zajeziórze village for years 2012-2018
(http://www.samborzec.pl/asp/pliki/pobierz/plan_odnowy_miejscowosci_Zajeziore.pdf)

5 ENVIRONMENTAL IMPACT ASSESSMENT - SUMMARY

5.1 LAND AND LANDSCAPE

Impact on landscape and ground surface will occur at the stage of the implementation of particular stages of works requiring construction equipment. Impacts will be associated mainly with displacement of soil during works, such as: expansion and rise in the existing bodies of embankments, excavations for construction of a new pumping station, construction of a levelling reservoir, construction of transfer canal and draining channel from the pumping station, etc.

Impact of works on landscape will be local. After the completion of works, the area will be ordered, and places of temporary occupancy will be reclaimed (cover with humus layer and sown with grass). New structure will supplement the existing flood protection system, thus they do not generate new, adverse impacts.

In the case of extension of the surrounding embankments in the industrial area of the Glass Factory and housing estate buildings, the planned scope of works will not substantially affect change in the functions of the area, and will essentially improve flood protection safety. The works are implemented on already existing facilities, therefore, the scope of changes in the landscape is minor.

Local impacts on land area and landscape will occur in the case of implementation of the structure Protection the embankments of Koprzywianka River - left embankment in km 0+000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400. At the stage of implementation, impacts will be associated with felling of individual trees and shrubs, in the scope resulting from the design solutions for expansion and stability of the embankment body. These actions will locally affect the landscape and result in decrease of its variety - it is planned to backfill local water holes and field cavities in the zone directly adjacent to the embankments, with min. width of 10 m with macro-levelling to the ordinates of the adjacent land (places of potential hydraulic cut-through). It is recommended to leave selected small water bodies and cavities as valuable morphological forms, as well as habitats for fauna and flora.

At the stage of operation, the Task does not generate new adverse impacts. After completion of earthworks, the areas of temporary occupancy will be ordered. Then, a layer of topsoil shall be spread (prior to the works commencements it shall be removed from the places), the soil surface shall be levelled and sown with a grass mix.

In order to limit the impact of works on the surface of ground and landscape during the Task implementation, mitigation measures should be implemented as described in Appendix No 1 to EMP.

5.2 CLIMATE

The Task will not have impact on changes in the climatic conditions on a large scale (city/region/country). On the other hand, small changes can be seen on the micro-scale, associated with change in base roughness caused by felling of trees or change in levels of the embankments and their extensions. Change in base roughness may cause locally small modifications of wind direction and velocity. It can be, however, stated that these changes will be negligible, and the Task implementation will not involve any actual hazards for climate at the place of implementation and in the environment.

In connection with the above, it is suggested not to introduce mitigation or monitoring measures with regard to climate.

5.3 AIR QUALITY

Emission of dirt, dust and gas will be present, first of all, at the construction stage. In the operation phase, after the completion of construction works, substantial emission of pollutants into the air is not anticipated. Standard works related with facilities maintenance shall be conducted (e.g. mowing of flood embankments slopes), a sporadic, additional emission is possible and related to the need to use generators in case of breaks in power supply to facilities.

The main sources of emission of pollutants at the construction stage will be combustion of fuels during operation of construction machines and transport of materials. At this stage, the main compounds emitted to the air will be: nitrogen oxides, carbon oxides, hydrocarbons and dust particles (suspended solids, and its quantity emitted to the air during works is not easy to estimate). The largest, temporary concentrations of pollutants will be observed at a distance of a few dozen meters from the source and at these places they can exceed acceptable norms (short-term situation, limited to the area of the structures and temporary routes implementation). In the direct neighborhood of the areas of works, there may be short-time growth in concentration of suspended solids in connection with dust from temporary roads and construction sites, lifting of materials from the exposed layers of the soil, etc. areas in association with operation of machines, vehicle traffic and dusting directly from transported materials. The generated pollutants along with the distance from the place of emission will be dispersed in the air. Emission of pollutants into the air at the construction stage will be short-term and reversible. It will not result in significant and permanent environmental impacts.

It was decided, however, that in order to limit the impact of works on the sanitary condition of air during the Task implementation, mitigation measures should be implemented, as described in Appendix No 1 to EMP.

5.4 SOIL AND LAND

At the stage of implementation, adverse impact on the soil is associated with earthworks, organization of the construction site and deep excavations. Sustainable degradation of the soil profile will affect places of permanent occupancy where following works will be

executed: construction of a channel, levelling reservoir, construction of pumping station along with storage reservoir, reconstruction of embankments, etc.

Locally, methods of use of areas will change (e.g. permanent occupancy within pastures). Owing to the scale of works and exclusion of biologically active area, these impacts will be local and will not cause a substantial deterioration in the condition of soils on this territory.

Hazards for soil are associated mostly with emergency situations, such as leakage of petrol derivatives in consequence of which the soil can be contaminated locally. Impacts will be local.

Adverse impacts related to temporary displacement of soil masses during the conducted earthworks will be temporary. After the completion of works, the area will be ordered and reclaimed by Contractor.

It was decided, however, that in order to limit the impact of works on the condition of soil and ground during the Task implementation, mitigation measures should be implemented, as described in Appendix No 1 to EMP.

5.5 SURFACE WATER

Structures implemented under the Task will have diverse character and range, and thereby - different degree of impact on the water environment. For this reason, the description of impacts on surface water will be submitted separately for particular structures.

- **Flood protection within the mouth section of the Atramentówka River, construction of a new pumping station "Koćmierzów" and of a gravity-type dam lock in Koćmierzów (in the right embankment of the Vistula River) and of a channel draining water from the Atramentówka River to the pumping station**

Construction and operation of a pumping station will not affect the condition of surface water. Furthermore, it will keep surface water on a given, pre-determined, safe for human and surrounding nature level.

Waters will be drained through pumping stations to the Vistula River (Surface Water Body the Vistula River from the Wisłok River to the San River) only during freshets. Owing to volume of pumped water to volume of flood flow in the Vistula River, which is 0.00024, and a small volume of drained waters (1.5 m³/s), a significant impact on the condition of Surface Water Body is not anticipated.

The action requires new structures, including construction of a channel and a canal draining water from the pumping station to the Vistula River, and construction of a levelling reservoir. It involves deep excavations within the inter-embankment zone. Impact on surface water will be temporary and local. Growing flow of water will involve

change in the dynamics of fluvial process across its small section. In the zone of the outflow of water bed erosion process may occur.

Works in beds will lead to a slight increase in the quantity of suspended matter in waters (water in the bed of Atramentówka River occurs only temporarily). Impact will cease after completion of earthworks. Potentially, during works construction period, there is a risk of incidental leak of oils and fuels from vehicles and construction machines, in the vicinity of Atramentówka River bed.

The planned action will not have a significant impact on biological elements of the Surface Water Body Vistula River from the Wisłoka River to the San River, due to the local scope of works on the scale of the Surface Water Body. It is possible to increase temporarily inflow of suspended matter into the Vistula River waters, especially while constructing drainage channel in the inter-embankment zone, however, it will not result in lowering ecological potential of the Surface Water Body in question. Construction of a new pumping station as well as making of a canal draining water from the Atramentówka River and the channel draining water from the pumping station to the Vistula River, may have, in the phase of implementation, moderate impact on the Surface Water Body Dopyw spod Sielca (Atramentówka River), due to possible flow of increased quantities of suspended matter along with storm waters running off to the river bed during earthworks.

- **Flood protection within the area of the Struga A watercourse together with an alteration and expansion of the pumping station "Nadbrzezie"**

Impacts within the channel Struga A can be considered hardly significant owing to the fact that this is an artificially excavated channel that drains waters from the land side of the embankment of the Trześniówka River to the "Nadbrzezie" pumping station through the strongly developed and intensively used areas. Change in technical parameters of a channel aims to increase flow capacity of the bed and reduce the risk of flooding the outskirts of Trześnia. The implementation will minimize the probability of sanitary contamination during flooding strongly developed adjacent areas along the Struga A bed.

Impacts at the stage of implementation will include temporary deterioration in quality of surface waters (growth in suspended matter and deterioration in oxygen conditions). At the stage of operation, especially during high waters in the Trześniówka River, greater capacity of the bed of Struga A will improve the quality of waters, due to limited flow of pollutants from presently flooded areas.

At the stage of operation, owing to little quantity of drained waters in the periods of increased water levels, there will not be any significant impact on change in the hydrological regime of the Surface Water Bodies.

The planned investment will not have significant impact on biological elements of the Surface Water Body Trześniówka River, because works will relate to a channel draining the land side of the embankment and the pumping station draining waters from it to Trześniówka River. The operation of the pumping station is planned only in the event of elevated flow of Trześniówka River and closing of embankment locks, and the expected

discharge of waters is in scale 1.1% as compared to flood flows of Trześniówka River, which will not have a significant impact on the Surface Water Body.

- **Expansion of the surrounding embankment protecting Glassworks and a Housing Estate against the flood waters in the town of Sandomierz together with an extension of the embankment of the Vistula River from the Lwowska Street to intersection of Koćmierzów embankment**

At the stage of implementation, impact on surface waters is related to works conducted directly in the port canal and interference in the canal bed. Impacts related to deterioration in water quality will be temporary and will cease after completion of the structure.

Works comprising of expansion and sealing of the existing flood embankments will have a moderate impact on the condition of the JCWP Sielec area tributary, in connection with the possibility of increased runoffs of suspended matter during earthworks on embankments. The location of embankment sections planned for reconstruction does not indicate the possibility of significant impact on the Surface Water Body Trześniówka River. Owing to the character of earthworks conducted within the Surface Water Body as well as related temporary deterioration in quality of the Surface Water Body (growth in suspended matter) which will cease after the completion of works, significant adverse impact on the condition of Surface Water Body Vistula River from the Wisłoka River to the San River is not anticipated.

At the stage of operation, the action will not have a significant impact on the condition of the Surface Water Body (including Surface Water Body Dopyw spod Sielca and Surface Water Body Trześniówka River from Karolówka to the mouth). Owing to a local character of the conducted actions, the action will not affect deterioration in the condition of waters and will not constitute a hazard for the established environmental goals.

- **Protection the embankments of Koprzywianka River – left embankment in km 0+000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400**

At the stage of implementation, impacts on surface waters may appear during earthworks in the vicinity of the river bed. Temporary deterioration in quality of waters associated with an increase of suspended matter will concern protection works conducted in the vicinity of channel outlets or at the places where an embankment is in a close vicinity to the river bed. A factor which can adversely affect the condition of water will be a segment change in the structure of banks as a result of strengthening in the vicinity of channel outlets, in the inter-embankment zone or at places of excessive approach of the embankment footing to the bed. However, the action will not thwart environmental goals in the JCWP Koprzywianka River from Modlibórka River to the mouth. It is planned to backfill some of the local water holes and field cavities in the zone directly adjacent to the embankments. For this purpose soil from works construction areas must be used.

As expected the object at the stage of works execution will have insignificant impact on biological elements in the scale of Surface Water Body Koprzywianka River from Modlibórka River to the mouth. Expansion of embankments across the whole length will

proceed on the side of the inter-embankment zone. Works are associated with the possibility of increased inflow of suspended matter into the waters of Koprzywianka River during earthworks. Precipitation and elevated level of waters while conducting works entail a significant risk of adverse impacts on fish species and macro-invertebrates living in the river.

The best period for execution of works in the immediate areas of the river bed is during summer months: July and August. At the stage of operation, the action will not have a significant impact on the condition of the Surface Water Body.

- **Construction of the water pumping station in Szewce**

All the works conducted within the existing water facilities may cause temporary deterioration in quality of surface waters of the Koprzywianka River, which will result in increased inflow of suspended matter. In the event of works related to sludge removal and clearance of a channel bed and its strengthening and strengthening of banks (from km 0+000 to km 0+101) greater than usually quantities of mineral matter will penetrate to the water. The scope of works is, however, relatively small, and these impacts will cease after the end of earthworks. Bottom and banks will be protected with openwork slabs laid on geotextile and partially buried with excess ground.

At the place of connecting the channel bed with the Koprzywianka River, along the length of approx. 30 m, the river bed and banks will be reinforced to the height of 0.5 m with stone charge, which will result in local interference in the structure of the river bed and banks of the course already strongly hydromorphologically transformed.

While conducting works in the Koprzywianka River bed, quality of the river waters will deteriorate periodically because of growing suspended matter. Local change in the structure of the river bed and banks will not change dynamics of water flow in the perspective of the whole Surface Water Body.

After completion of earthworks, the above impacts will cease. At the stage of operation, new significant impacts, including greater than in the conditions present suspended matter in surface waters, are not anticipated.

The planned object will not have significant impact on biological elements of the Surface Water Body Koprzywianka River. The best period for execution of works in the immediate vicinity of the river bed is during summer months: July and August.

Owing to the character of earthworks conducted within the river bed of the Surface Water Body as well as related temporary deterioration in quality of the Surface Water Body waters (growth in suspended matter), which will cease after the completion of works, significant adverse impact on the condition of Surface Water Body Koprzywianka River from Modlibórka to the mouth and the Vistula River from the Wisłoka River to the San River is not anticipated.

- **Expansion of the water pumping station in Zajeziarze**

Impacts on surface water are related to transfer of storm water via the pumping station from the Course from Zajeziarze to the Koprzywianka River, when the level of water in the Koprzywianka River is higher than normal, preventing gravity run-off from the drainage basin or when flow from the Course from Zajeziarze exceeds flow capacity of the designed lock embankment at the outlet.

Certain adverse impacts will appear at the stage of earthworks conducted both within the canal and within its outlet - in the bed of the Koprzywianka River. However, small interference in the Koprzywianka River bed is planned. The stage of implementation will involve temporary deterioration in physical-chemical parameters (oxygen conditions, increase in suspended matter). Impacts will be short-term and will cease after the completion of works.

At the stage of use, no new impacts substantially influencing the condition of surface waters of the Koprzywianka River are anticipated. Stormwaters and thaw waters discharged to the Koprzywianka River through the embankment lock and pressure pipelines will not deteriorate quality of waters in the Koprzywianka River. The action has no impact on the condition or ecological potential of surface water.

Modernization works will increase the efficiency of the pumping station which will entail a change in dynamics of flow of water in the Koprzywianka River in the section from the canal outlet to the mouth to the Vistula River. Impact related to increasing this change in dynamics of flow will be local and will not have a substantial impact on the hydrological regime and potential of the Surface Water Body Koprzywianka River from Modliborki River to the mouth.

Owing to the character of the planned action consisting in repair of the existing facilities, no adverse impact on the potential of the Surface Water Body Koprzywianka River from Modliborki River to the mouth is anticipated. However, the action does not pose threat to environmental goals.

In order to limit the impact of works on the condition of waters throughout the period of the Task implementation, mitigation measures, as specified in Appendix No 1 to this EMP, should be implemented.

5.6 GROUNDWATER

Owing to the local scope and character of impacts, no significant, adverse impact on quantitative and qualitative condition of ground waters is anticipated.

Owing to the scope and character of impacts, no adverse impact on quantitative and qualitative condition of ground waters of the examined part of the Vistula River Valley and the JCWPd, including on the Main Underground Reservoir 425, is anticipated.

In order to prevent possible adverse impacts at the stage of implementation of works on the condition of ground water, mitigation measures, as specified in Appendix No 1 to this EMP, should be implemented.

5.7 ACOUSTIC CLIMATE

Under the Task implementation, there are the following categories of works distinctively affecting acoustic conditions:

- construction works related to extension and protection of embankments, reconstruction of course beds,
- construction works related to construction/expansion of the pumping station, and demolition of the present hydraulic infrastructure.

In the case of works related to extension and strengthening of embankments, reconstruction of course beds, acoustic impacts may occur in association with operation of heavy construction equipment like: bulldozer, tipper truck, motorized trencher, pull shovel, etc. Additionally, as part of works covering anti-filtration protections in embankments, pile-drivers and cement tankers will be used, which results directly from the planned works technology and the scope of the Contract. Acoustic impacts at the stage of the Task execution will be short-term and temporary - after the completion of works (operation stage) the previous condition will be restored. To ensure protection of residential buildings located near the construction site, works in the acoustically protected areas¹⁷ should be conducted from 6:00 am - 10:00 pm, and construction equipment is to be characterized by adequate for a particular type of vehicle noise emission and be fully operational throughout the period of works execution. In areas adjacent to the working sites nuisance for inhabitants and the environment might be caused also by constant work of pumping engines.

Similar impacts will be present at the stage of execution of construction works related to renovation and construction of the pumping station. Works in the acoustically protected areas will be carried out only in the day time (6:00 am - 10:00 pm). At the stage of operation of the pumping station, it is not planned to exceed standards specified by legal regulations - pumps will be installed in steel tubular shafts protected with reinforced concrete alloy. The whole structure will be placed in new buildings. In the case of power supply (power line) failure with simultaneous occurrence of freshets in the reclaimed drainage area, it is planned to use power generating units - the operation will entail short-term and reversible acoustic impacts.

¹⁷ areas under acoustic protection are areas indicated in Article 113.2 of 27 April 2001 on Environmental protection law (Journal of Laws of 2013, item 1232, as amended) and the Regulation of the Minister of Environment of 14 June 2007 on permissible noise levels in the environment (Journal of Laws of 2014, item 112) for which the standards of acoustic impacts have been specified

It was decided that in order to limit the impact of works on the acoustic conditions throughout the period of Task execution, mitigation measures should be implemented, as described in Appendix No 1 to EMP.

5.8 NATURE

5.8.1 PROTECTED NATURAL HABITATS AND PROTECTED SPECIES OF PLANTS AND ANIMALS

Directly at places of works execution there is no interference in natural habitats. Interference is present in the surrounding of places of works execution and consequently, in order to avoid unfavorable impacts, appropriate mitigation measures should be implemented.

However, during the works, there's a possibility of finding protected plant species, and as a result it will be necessary to implement actions related to monitoring of impacts and supervision over works. In the case of finding protected species of plants, the Contractor will obtain appropriate permits of the Regional Directorate for Environmental Protection/General Directorate for Environmental Protection (RDOŚ/GDOŚ) for deviation from the prohibition in relation to protected species (issued under the Act of 16 April 2004 on environmental protection (NEPA)).

Protected animal species identified in the area of works execution will be subject to indirect impacts related to carrying out earthworks and construction works, traffic of vehicles and machines, and other factors connected with execution of construction works. Some impacts will be caused by cutting down trees and shrubs within construction sites. It is planned to backfill some of the local water holes and field cavities in the zone directly adjacent to the embankments of Koprzywianka River, thus some impacts on flora and fauna might occur.

This impact will concern mainly periodical startling and disturbing of animals as well as potentially increased, accidental mortality. It is necessary to implement mitigation measures impacts at the stage of works, as described in Appendix No 1 to EMP.

5.8.2 PROTECTED AREAS

The Task will be executed only partially within protected areas - within the SCI Tarnobrzaska Vistula River Valley PLH180049. Works will be executed in the Vistula River inter-embankment zone located within the boundaries of the SCI. This area was significantly transformed during the flood in 2010, and currently does not feature significant natural values.

In order to prevent other impacts of works on the protected areas throughout the period of Task execution, mitigation measures should be implemented, as described in Appendix No 1 to EMP.

5.9 CULTURAL LANDSCAPE AND MONUMENTS

Works performed within the Contract 3B.1 shall be located outside of the areas of cultural assets and monuments legally protected by an entry to the register of monuments and/or commune register of monuments. In the case of objects Flood protection within the area of the Struga A watercourse together with an alteration and expansion of the pumping station "Nadbrzezie" and Protection the embankments of Koprzywianka River – left embankment in km 0+000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400 works will be conducted nearby an archaeological site. Moreover due to long history of inhabiting Sandomierz and its surroundings, there is probability of discovering items of great cultural and historical values (within all construction sites).

IAs per the Act of 23 July 2003 on historical monuments law (Journal of Laws of 2014, item 1446, as amended) if a person discovers an object during construction or earth works, which may be a historical monument, such a person shall suspend all the works likely to destroy or damage the objects discovered, shall secure them with the use of available measures and shall notify the Provincial Conservator of Historical Monuments immediately, and if impossible, the Mayor of Sandomierz. The Contractor shall also notify the Engineer in this respect.

The Task's implementation will positively affect protection of cultural goods and monuments owing to improvement in flood protection safety and reduction in the risk of flooding.

In order to prevent and limit the impact of works on cultural landscape and monuments throughout the period of Task execution, mitigation measures should be implemented, as described in Appendix No 1 to EMP.

5.10 TANGIBLE ASSETS

As regards protection of tangible assets, the execution of the Task will improve flood safety to the city of Sandomierz, Samborzec Commune, Koprzywnica Commune and Gorzyce Commune, including significant industrial plants. In the neighborhood of the construction sites and the roads it is also possible that there will be impact on the buildings located in the vicinity. No adverse impacts on tangible assets shall be observed.

5.11 HUMAN HEALTH AND SAFETY

Impact on health and safety of people in the course of the Task implementation may be associated, among others, with the following factors:

- growth in emission of pollutants to the air,
- increased noise emission,
- contamination with oil substances,

- access of unauthorized persons to the area of construction works,
- occurrence of increased water levels in the Vistula River creating hazard for the area of works and adjacent areas,
- increased traffic within works construction sites and adjacent areas.

Therefore this EMP contains appropriate mitigation measures in this respect (Appendix No 1 to EMP).

5.12 EXTRAORDINARY HAZARDS

With regard to the Task in question, the occurrence of flood in the period of running works related to modernization of the existing embankments may be considered similar to industrial breakdown - in the period of a flood wave on the land side of the embankment there can appear construction machines, construction materials and other elements of infrastructure or equipment. Freshets of this kind are extreme phenomena; in the case of the region of Sandomierz a flood wave can be anticipated with a great deal of probability adequately earlier and precautions can be taken - equipment and people can be evacuated from hazard zones. Attention should be also paid to the possibility of occurrence of a flood wave in the period of conducting works related to modernization of the existing embankment near Sandomierz. Before commencing works, the Contractor will prepare an appropriate plan of action in the case of this kind of events (the construction site's flood management plan for the time of the works) and will obtain approval of the Engineer for its content.

Another type of extraordinary hazard is leakage of petrol derivatives to waters or to the soil. For this purpose, however, appropriate preventive measures are used, relating to appropriate organization of sites and construction facilities and permanent control over the used construction equipment.

Another kind of extraordinary hazards for the environment as well as for health and safety of people is a possibility to find unexploded shells. In this case, the Contractor should immediately stop working and evacuate employees and notify the police, licensed sapper's unit, the Engineer and PIU. During earthworks, the Contractor will be obliged to provide sapper's supervision for regular checking of and cleaning of land, of hazardous military objects, along with their utilization. Prior to commencing the works, the Contractor examines the area of works for unexploded shells.

5.13 CUMULATIVE IMPACTS

The impacts of the objects: Construction of the water pumping station in Szewce and Expansion of the water pumping station in Zajeziarze related to the stage of the construction may accumulate with the phase of implementing the object Protection the embankments of Koprzywianka River – left embankment in km 0+ 000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400.

The implementation of these three objects should be carried out in coordination with each other and possible other planned investment projects, so as to eliminate and minimize the inconveniences related to their effects on the environment related to the phase of the implementation by e.g. proper organization of works.

There will be no cumulative impacts related to simultaneous execution of the concerned Task and other possible works in the area where impacts may accumulate with impacts generated under the Task. In the vicinity of the area of Task works, there is no plan to execute other works within a foreseeable time frame, which could lead to accumulation of adverse environmental impacts.

6 DESCRIPTION OF MITIGATION MEASURES

6.1 LAND AREA AND LANDSCAPE

In order to limit the adverse impact of the Task on the land and landscape, mitigation measures have been planned that will be executed before commencement of the works as well as during construction works. The stage of conducting construction works must be preceded by preliminary works involving preparing the area for Task. i.e. preparing the places for storing building materials, for site facilities, etc. and allocating and preparing (and consulting with the road administrators) of traffic routes for machines and vehicles.

Temporarily occupied sites (service roads, sites, building site facilities, construction material deposits, parking, etc.) should be located and provided in accordance with Contractor's environmental team instructions and approved by the Engineer.

Machines and vehicles should use service roads and vehicle circulation areas only. Order should be maintained on the Site as well as proper works' management.

Area occupation as well as land surface transformation during the works must be limited to the necessary minimum. Earthworks which permanently deform the site are not allowed, except for the works executed as part of the Task. Roads, construction sites and site facilities should be arranged in such a way as to keep any trees and shrubs growing outside the places necessary for occupancy in connection with the works execution. Temporary occupation sites (temporary roads, sites, building site facilities, construction material storage, parking sites, etc.) must be located beyond the areas of a natural environment indicated by the Contractor's environmental team and approved by the Engineer, and outside the Odra River inter-embankment zone. They should also be located as far as possible from the built-up areas and river beds. Access to the building site facility and the building site must be led along public road, or if not possible, on concrete slab roads provided for the Task in the inter-embankment zone. It is necessary to minimize the use of heavy duty machines and devices as well as to limit works on the inter-embankment zone only to required works (extension of the embankment, temporary road along the embankment, embankment structures).

Upon completing construction works, it is necessary to reinstate temporarily occupied sites to their previous condition (land reclamation). At the places where topsoil was removed, topsoil should be replaced and sowed with natural grass mixes (composition of grass mix will be agreed on with an expert - botanist of the Contractor) and adequately taken care of, by, among others, mowing in June and September, covering also defects notification period.

Mitigation measures related to the protection of ground surface and landscape have been put together in Appendix No 1 to EMP.

6.2 CLIMATE

In the case of the Task in question, mitigation measures with regard to the protection of local climate conditions have not been found necessary.

6.3 AIR QUALITY

The following mitigation measures aimed at the reduction/elimination of the Task's negative impact on the air quality are recommended:

- equipment used at the stage of construction works and operation must be in perfect technical order and satisfy all the legal requirements for the purpose of ensuring protection against dusts and gases being emitted to the air;
- loose materials and aggregate intended for being used at the construction stage must be protected against being blown away and against excessive dusting during transport, storage, as well as during construction works;
- it is necessary to apply required technical and organizational measures in order to maintain clean access routes and to introduce measures limiting dust emission at the time of transporting construction materials, conducting construction works and from building sites;
- it is necessary to apply required organizational and technical measures in order to limit dust emission at the time of transporting and storing of construction materials. Special attention shall be paid to effective limiting the dusting in case of performing works close to fruit orchards. (Structure: Protection the embankments of Koprzywianka River – left embankment in km 0+ 000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400)
- it is necessary to limit the operating time of combustion engines, construction machines and cars equipped with diesel compression-ignition engines and vehicle speed must be reduced in the area of the building site;

In order to protect air quality, including assurance that no additional unidentified currently impacts appear, it is necessary to implement above mitigation measures. The mitigation measures in the scope of air protection are presented in the Appendix No 1 to EMP.

6.4 SOIL AND LAND

In the course of works execution, mitigation measures reducing the impact on the soil should be implemented, mainly in the areas of temporary occupation.

The protection measures on the work performance areas have also been specified. Prior to the commencement of earthworks, it is necessary to remove approx. 30 cm thick layer of humus which will be re-used for subsequent land reclamation. The Contractor should choose a place for storing humus in a way which will protect it from damage, compacted, and which will ensure its re-use. If the case that ground leveling is needed in the inter-

embankment zone Koprzywianka River, soil from construction sites shall be used for backfilling of cavities.

In the course of works execution, it is required to use only efficient equipment, in order to protect ground against contamination. The Contractor must also comply with other conditions relating to prevention and reduction of impacts on the soil. Surface of the places designated for vehicles and construction machines should be paved and equipped with appropriate sorbents preventing penetration of soils with harmful substances for the time of the works.¹⁸

In the places allocated for re-fueling and parking of vehicles and machines a station with sorbent should be arranged for removal of possible leaks and outpours of petrol derivatives.

Refueling should be carried out with the use of mobile or stationary points of fuels distribution with adequate protection, such as station with sorbent used for removal of leaks and overflows of oil derivatives to the ground.

Additional measures minimizing impact on the soil include: ban on repairing equipment and machines, exchanging oil and re-fueling and warehousing propellants within the Vistula River inter-embankment zone, as well as within the naturally valuable areas designated by the Contractor's environmental team, as well as ban on parking machines in the Vistula River inter-embankment zone and naturally valuable areas designated by the Contractor's environmental team.

The Contractor should maintain the equipment, vehicles and plant and use all available resources to eliminate possible pollution of soil and water environment, in particular occurrence of spills of fuel, hydraulic oil and oil-derived substance during handling, fueling, transport and operation of machines, equipment and vehicles.

Equipment, plant and vehicles used for construction works must be placed in dedicated parking spaces provided with protective measures against spillage of oil derivatives to the soil and water environment. If the equipment, plant and vehicles are not in use, they must be parked in these dedicated places.

Grease and fuel to be stored at adequately prepared place with relevant sealing degree and equipped with sorbent to neutralize petroleum substance.

Mitigation measures related to the protection of the soil and grounds are put together in Appendix No 1 to EMP.

¹⁸ Structures: Expansion of the surrounding embankment protecting Glassworks and a Housing Estate against the flood waters in the town of Sandomierz together with an extension of the embankment of the Vistula River from the Lwowska Street to intersection of Koćmierzów embankment, Protection the embankments of the Koprzywianka River - left embankment in km 0+000 ÷ 12+900, right embankment in km 0+000 ÷ 14+400

6.5 SURFACE WATER

The Task does not cause permanent adverse impacts on the condition of surface water. Only temporary adverse impacts are possible as well as impact as a result of unforeseeable events as failure and penetration of pollutants into water. Actions for the protection of surface water are consistent with actions for the protection against pollution of soil (relating to appropriate works organization and location of places of temporary occupation).

Adverse impacts on the condition of the surface water bodies designated at the place of the Task implementation are not anticipated.

It is required to maintain order on the building site and to ensure appropriate organization of works. Only neutral materials or materials which are not harmful to the environment may be used in the performance of works.

Within excavations, it is necessary to use an appropriate draining system, ensuring the maintenance of excavations without stagnant water.

In the event of oil derivative substance spillage to surface water, the Contractor is obliged to ensure mechanical collection of the substance from the water surface.

In case of possible leakages and spillages of petroleum substances into surface waters proper sorbent must be used. Building site facilities must be equipped with sorbents throughout the Task implementation period. The manner of soil masses management must not change the water levels with detriment to the neighboring soil.

Mitigation measures and prevention from adverse impacts at the stage of works, related to the protection of surface water, are put together in Appendix No 1 to EMP.

6.6 GROUNDWATER

The Task does not generate adverse impacts on the condition of ground water. Preventing measures related to the protection of ground water are put together in Appendix No 1 to EMP.

6.7 ACCUSTIC CONDITIONS

The works planned within the Task shall not cause negative impact on areas under acoustic protection. The impacts shall be periodic and limited directly to the area of the works implementation site. However, it is assumed to implement mitigation measures in order to limit intensity of impact at the stage of works implementation:

- a) construction works in the areas under acoustic protection must be carried out only during the day, i.e. between 6:00 a.m. and 10:00 p.m.;
- b) construction equipment must be in a good technical order, it must have low noise emission level and have sound absorbers;

- c) the Contractor shall perform works with the use of technologies with a low noise emission level and with the maximum limitation of such works in time;
- d) it is necessary to use the technologies of construction works which are least burdensome in terms of acoustics, maintain good work management, correct equipment operation and ensuring correct technical order.
- e) in the areas under acoustic protection and the sites adjacent to these areas, in order to mitigate the nuisance for inhabitants and environment, it is allowed to use only pumping engines equipped with soundproof housing.

It is allowed to conduct works at night only in the event of a flood risk.

A set of actions related to reduction of noise emission is presented in the Appendix No 1 to the EMP.

6.8 NATURE

6.8.1 NATURAL HABITATS, FLORA AND FAUNA

In order to prevent and restrict negative impacts a number of mitigation measures have been suggested to be implemented at the stage of works execution.

The Contractor should provide the schedule for execution of works so that the dates and location of respective stages of construction works are in compliance with requirements of environmental decisions and EMP and so that they do not affect species under protection which are found on the Task implementation area and in its vicinity.

The location of temporary occupation sites (roads, sites, etc.) must be each time agreed with the Engineer's environmental team. Contractor also ensures supervision by its own environmental team. The Contractor's environmental team shall include the following experts: ornithologist, herpetologist, chiropterologist, entomologist, botanist/phytosociologist, water protection expert. Prior to the commencement of works, it is necessary to conduct site survey of the areas of temporary and permanent occupation aimed at determining the current distribution of protected plants and those present in the national and regional red lists of the endangered species of plants and determining the sites of potential occurrence of such species. During construction works it is not allowed to destroy plants outside the Task area.

The period of conducting felling of trees and shrubs to the extent necessary to implement the Task has been determined - from 16th October until the end of February. Trees and shrubs not intended for logging, that are growing in the area of the Task implementation and exposed to damages by vehicles, displacement of equipment, etc. should be protected against damage, e.g. by placing trunk covers of planks around entire tree trunks, up to the height not less than 1.5 m.

Works to be carried out in a way which will avoid animal mortality. In order to minimize possible negative impacts on the species of animals settled in trees, there are

procedures established and a need for conducting an environmental team in order to limit possible negative impacts on the populations of protected species (ex. inspection of trees intended for clearance by experts). In the event of the necessity to transfer plant species, the Contractor is obliged to first – plan the activities, obtain relevant permits and then effectively carry out those activities, as well as implement other measures indicated in the permit (i.e. preparing reports and submitting them to permitting authorities). The methods and requirements have been determined for reducing accidental animal death, e.g. near excavations and other works performance areas.

Prior to commencement of the construction works a site inspection or construction sites should be carried out with participation of botanist or phytosociologist in order to locate the presence and estimate the population of invasive plants (except for Small Balsam *Impatiens parviflora*). After locating and visibly marking the areas where invasive plants grow, there's a need of taking preventive actions during the implementation of the Contract, which will reduce spreading of these plants, including, among others, removing topsoil layer along with invasive plants and transporting them from area of works to the composting plant or neutralizing in any other effective manner. It is unacceptable to mix this topsoil with topsoil overgrown with local native vegetation.

All the excavations must be protected against access of animals and regularly controlled in the period of conducting works. Additionally, according to the recommendations of a herpetologist, it is necessary to secure the routes of amphibians migration to reservoirs and ponds (for instance by making appropriate fencing) in order to limit a death rate among them caused by vehicle traffic. It is also necessary to secure any cavities around building sites, which are filled up with water, against the access of amphibians and their breeding within such cavities – works must be carried out in compliance with the recommendations of a herpetologist. If animals get to the building site, it is necessary to ensure their safe relocation to substitute and appropriate habitats.

Works within the Koprzywianka River bed must be performed in the period from July to August. It is forbidden to conduct works in the fish spawning period (i.a. rainbow trout and grayling) which starts in September and ends in April.

Before commencing earthworks connected with the Task implementation, it is necessary to remove a layer of humus from permanently and temporarily occupied areas. Detailed implementation dates have been specified for this type of works. Within the Atramentówka River bed and adjacent structures covered by works, it is necessary to ensure appropriate conditions, enabling migration of mammals and amphibians. Works on swampy areas will be carried out beyond the amphibian breeding season, i.e. beyond the period from March to April. This period may be extended if a herpetologist determined ongoing amphibians breeding.

In the event of damage to trees, the necessary maintenance measures to be introduced immediately by the Contractor under the supervision of Contractor's environmental team to limit effects of the damage.

The Contractor and Contractor's environmental team is responsible for implementation of the rules and conditions of the EMP for Contractor's management and engineering-technical personnel.

Contractor's environmental team prepares necessary materials and requests, and obtains permits for deviation from prohibitions of protection of species of plants, fungi or animals on the terms and in the mode specified by the NEPA. The above-mentioned decisions issued by RDOŚ/GDOŚ are to be requested for by the Contractor.

Complete list of mitigating activities within the scope of animate nature is included in Appendix No 1 to the EMP.

6.8.2 PROTECTED AREAS

Actions restricting adverse impact of the Task, will be related, above all, with a selection of areas for temporary occupation (sites dedicated for storing materials, earth masses, temporary roads, etc.) in the course of the Task implementation and at the place where the Task will be implemented in the SCI Tarnobrzaska Vistula River Valley PLH180049, actions for the protection of nature habitats, fauna and flora apply also to the Natura 2000 site.

Construction sites within the Natura 2000 area should be fenced for the duration of works. Fencing should protect Natura 2000 site from unauthorized access of employees working on Site and from entering the Natura 2000 site by machines and vehicles.

In the course of works, the Contractor is also obliged to comply with standards, bans and recommendations, and respect limitations resulting from the existence of areas and structures established under the Act on Nature Protection.

Mitigation measures related to protected areas are put together in Appendix No 1 to EMP.

6.9 CULTURAL LANDSCAPE AND MONUMENTS

Gathered knowledge and materials concerning the planned Task indicate lack of significant risks related to the implementation of the Task on monuments and cultural landscape. However, the Contractor will be obliged to implement preventive measures in case of adverse impacts.

As per the Act of 23rd July 2003 on historical monuments law (Journal of Laws of 2014, item 1446, as amended) if a person discovers an object during construction or earth works, which may be a historical monument, such a person shall suspend all the works likely to destroy or damage the objects discovered, shall secure them with the use of available measures and shall notify the Provincial Conservator of Historical Monuments immediately, and if impossible, the Mayor of Sandomierz. The Contractor shall also notify the Engineer in this respect.

In the locations where works will be conducted within archaeological sites, prior to the commencement of works, the Contractor shall ensure archaeological rescue excavations performed by a qualified person. The above will ensure the removal of valuable objects

and other elements of a historical value from the Site and will enable the performance of specific works. During the works, continuous archaeological supervision will be ensured.

In order to execute the aforementioned provisions, the Contractor will also obtain the permit from the Provincial Conservation Officer of Monuments (WKZ) for running archaeological rescue research.

Mitigation measures related to the protection of monuments are put together in Appendix No 1 to EMP.

6.10 TANGIBLE ASSETS

The Task's implementation involves the need for temporary occupation of land (sites allocated to storing of materials, oil, temporary roads, etc.), for necessary felling of trees and difficulties in the road traffic. The scale and scope of changes in the use of areas are relatively small (most works are performed on the existing elements of flood protection infrastructure) in comparison to significant improvement in flood protection safety of all structures located throughout the area of Sandomierz.

Under the Task it is planned to renovate the existing and construct new hydraulic structures, rebuild linear structures colliding with embankments. Residential, agricultural and commercial buildings will not be demolished. Pumping stations included in this Task will be rebuilt.

The Contractor shall be responsible for any damage to the structures, buildings, roads, drainage ditches, culverts, water supply and gas pipe lines, power poles and power lines, cables, land survey control network and any type of services as well as other types of facilities such as vertical and horizontal signs, navigation aids, information boards, cultural assets etc., caused by the Contractor or his Subcontractors during execution of works. The Contractor is also responsible for restoring the flow capacity of drainage ditches and drainage services in the area of conducted works and transport roads, in case of damage caused by execution of works and transport related to works implementation.

The Contractor shall immediately repair any damage at his own expense and also, if necessary, shall perform other works ordered by the Engineer.

The conditions of roads use have been determined for the Task implementation. Prior to commencement of works the Contractor will present to the Engineer for approval, traffic arrangement and works security plans as well as the Programme agreed with the road management authorities. Depending on the needs and works progress, the traffic arrangement plans shall be updated by the Contractor on on-going basis.

The Contractor is obliged to agree with road management authority of the traffic arrangement and works security plan. The Contractor is obliged to organize traffic in accordance with the agreed plans (marking and securing the Site and marking of de-tours and recommended road signage related to change of traffic organization, etc.).

The Contractor will provide traffic arrangement design for the duration of the Works, in accordance with the provisions of Technical Specifications and requirements of Roads Department regarding transport and conditions of roads use.

During works performance the Contractor makes efforts to minimise the burdens for the vehicle traffic existing in the works area (among others by ensuring access to the properties, passages to the public utility places).

The conditions of securing the existing roads have been determined for the Task implementation. The Contractor shall respect the statutory limitations of loads per vehicle axle during transport of materials and equipment to and from the construction site. The Contractor shall also obtain any necessary permits from authorities, for transport of non-standard loads and shall constantly inform the Engineer about each case of such a transport.

6.11 HUMAN HEALTH AND SAFETY

Actions related to the protection of health and safety of people and elated to appropriate organization of works, technical measures, fire protection, construction sites, condition and use of vehicles and machines and training in transmitting HIV-AIDS have been determined.

Contractor's OH&S supervision shall be responsible for adequate marking of building site according to applicable laws. This marking shall be regularly controlled, in the case of destruction or theft of marking the Contractor shall promptly rebuild or supplement it. The Contractor is responsible for Contractor's management and engineering-technical personnel training regarding the rules and conditions of the EMP. Works within the flood embankments must be carried out in a way that does not endanger the safety of persons and property.

Mitigation measures related to the protection of health and safety of people are put together in Appendix No 1 to EMP.

6.12 EXTRAORDINARY HAZARDS

Crisis situation

In the case of emergency, in the first place, the competent services should be notified:

Service	Phone no.
Alarm number available on the mobile phone	112
Police	997
Fire brigade	998
Emergency medical Services	999
Municipal police	986

Flood

With regard to the Task in question, the occurrence of flood in the period of execution of works related to modernization of the existing embankments may be considered similar to industrial breakdown. During the period of a flood wave the construction equipment, construction materials and other elements of infrastructure or equipment can be present on the land side of the embankment. Freshets of this kind are extreme phenomena; in the case of the region of Sandomierz a flood wave can be anticipated with a great deal of probability adequately earlier and precautions can be taken as well as appropriate preventive measures specified in the construction site's flood management plan for the time of the works.

Leak of petrol derivatives

Another type of extraordinary hazard is leakage of petrol derivatives to water or to the soil. However, for this purpose appropriate preventive measures are provided, relating to appropriate organization of sites and site facilities, equipping places of possible leaks with proper sorbents and control of the condition of used construction equipment. In the event of any spillage of oil derivatives, it will ensure that any leakage is immediately removed and contaminated soil layers are managed in compliance with the applicable legal regulations.

Discovery of unexploded shells

Works will be conducted in the Vistula River valley, partially at a small distance from the river bed. Due to the fact that in this area war operations were conducted during War World II, there is a possibility of finding unexploded shells during construction works such as: detonators, missiles, aerial bombs, artillery and rifle bullets, armored missiles, grenades, mines, explosive materials, scrap containing the residues of explosive materials, etc.

In the event of discovering unexploded shells, the Contractor shall immediately stop the works, evacuate workers and notify the police, a licensed sapper unit as well as Engineer and PIU.

It is strictly forbidden to dig out unexploded shells, raise them, bury them, transfer them or throw them to the fire, river, channel, oxbow lake, channel etc. The Client does not explore the Site in terms of the presence of unexploded shells.

The Contractor shall ensure sapper supervision throughout the performance of earthworks, which will consist in on-going inspection and clearance of the area, including the sites of former military ranges, from hazardous objects of a military origin and their disposal.

Fire

Fire safety in the area of the Task rests with the Contractor. Detailed procedure in case of fire will be contained in the SHPP prepared by the Site Manager.

6.13 WASTE AND WASTEWATER

The Task implementation will involve generation of waste, therefore in the course of works it is necessary to minimize their quantity and reduce their adverse environmental impact. Waste management must be carried out in accordance with the Act of 14th December 2012 on waste. It is required to follow a rule of minimizing the amount of the waste generated. The generated waste should be adequately segregated and successively received. At the stage of its temporary storage, it is necessary to ensure appropriate containers and/or separate and adequately adapt for this purpose places preventing dusting and dispersing light fractions and their adverse environmental impact.

Hazardous waste should be handled in the following mode: until transferring it to entities having permit for their disposal, it should be stored in a manner preventing the penetration of hazardous substances to the environment, i.e. in tightly closed containers, covered places, with paved and impermeable base, protected against third party access. Places of storage of hazardous waste should be designated outside the area of the range of flood waters.

It is essential to ensure regular waste disposal of household sewage collected previously in septic tanks by a specialized company holding appropriate permit. Places designated for vehicles and construction machines service should be, for the duration of the works, paved and equipped with appropriate sorbents. There should also be drainage of rain water from paved yards ensuring removal of petrol derivatives.

It is not allowed to store on the building site of any waste connected with repairs and maintenance of equipment, machines and devices used for construction works. Any repairs of machines and servicing must be carried out by specialized companies or persons authorized to perform these works by the manufacturer (authorized service). Waste generated during these works (i.e. damaged parts, seals, filters, containers after lubricants and fluids, used oils, fluids, etc.) must be collected by contractors of repairs and services and they cannot be stored on the building site. They must be managed in compliance with applicable law.

The guidelines related to handling waste are contained in Appendix No 1 to EMP.

6.14 REQUIREMENTS FOR IMPLEMENTATION OF ACTION PLANS IN THE CONSTRUCTION PHASE

The Contractor, on the basis of specified mitigation measures, determined in the environmental impact report and this EMP (Chapter 6, Appendix No 1 and decisions in Appendix No 4) executes works under the Contract 3B.1.

The Contractor prepares their own procedure of implementation of mitigation measures, which is included in the Quality Assurance Plan.

The Contractor shall prepare its own procedure of introducing mitigating measures which will be included in the Quality Assurance Plan and shall obtain the Engineer's approval prior to the commencement of works.

At the same time, the Contractor shall devise the following documents, which are necessary for the performance of construction work and shall submit them to the Engineer:

- Building site organization design, which should include, among others, the following elements:
 - Location of the construction site facility,
 - Managing the construction site facility,
 - Securing the construction site facility,
 - Service roads,
 - Environment protection within the construction site facility.
- Waste management plan, which should include, among others, the following elements:
 - Encountered and estimated types and volumes of waste,
 - Manners of preventing negative impact of the waste on environment,
 - Manners of waste management taking into account collection, transport, recovery and treatment of waste,
 - Type of generated waste and way of its storage.
- Quality assurance plan, which should include, among others, the following elements:
 - Works performance organization,
 - Organization of traffic on the construction site together with marking of the works,
 - OH&S and environment protection,
 - List of working teams,
 - Scope of duties of the key personnel,
 - Quality control,
 - Laboratory tests.
- The construction site's flood management plan for the time of the works, which should include, among others, the following elements:
 - Monitoring hydrological and weather situation,
 - Conditions for allowing overflows in the period of works performance,
 - The rules of work for the Contractor's team in the period of flood risk,
 - Basic duties of the members of the Flood Protection Team,
 - List of people with assigned duties in the period of flood risk,
 - List of equipment and transport means needed to conduct rescue actions
- SHPP which should contain among others such elements as:

- indication of Land development elements, which may create safety and health risks,
- information on anticipated threats, occurring during construction works, defining the scale and types of hazards and the place and time of occurrence,
- information on separation and marking of places of conducting construction works, according to the hazard type,
- information on the way of conducting training of employees prior to the commencement of particularly hazardous works ,
- determining the method of storing and transport of hazardous materials, products, substances and preparations at the construction site,
- indication of technical and organizational measures preventing hazards resulting from the performance of construction works in the zones of particular health danger or close to them, including those ensuring fast and efficient communication, enabling immediate evacuation in the case of fire, accident or other threats,
- indication of the storage location of construction documentation and documents necessary for proper operation of machines and other technical devices.

The aforementioned documents will be approved and supervised by Engineer.

The Contractor, while preparing the aforementioned documents, shall consider applicable Operational Policies of the World Bank for protection of health and safety and environmental issues. The Engineer shall review and approve the above-mentioned documents.

7 DESCRIPTION OF ENVIRONMENTAL MONITORING MEASURES

7.1 ENVIRONMENTAL MONITORING DURING WORKS

7.1.1 LAND AND LANDSCAPE

In case of the Task in question, monitoring will include elements such as: location of places of temporary occupation beyond naturally valuable areas designated by the Contractor's environmental team, location of roads and sites and site facilities, including reducing impacts on plant cover and ground surface. Monitoring will also cover compliance with the principles of movement of vehicles on designated temporary roads, as well as appropriate reclamation of places of temporary occupation. Monitoring will cover also control of land occupation in areas adjacent directly and located outside the boundaries of the Task implementation. The guidelines connected to monitoring of this element of the environment are put together in Appendix No 2 to EMP.

7.1.2 CLIMATE

In the case of the Task in question, monitoring with regard to the protection of local climate conditions has not been found necessary.

7.1.3 SANITARY CONDITION OF THE AIR

It is not necessary to carry out monitoring with regard to air quality in connection with the Task implementation. However, it is necessary to monitor implementation of mitigating measures. Detailed guidelines related to monitoring are specified in Appendix No 2 to EMP.

7.1.4 SOIL AND LAND

It is necessary to monitor the quality of sediments intended for excavation from channel beds and monitoring of mitigating measures execution.

The guidelines related to monitoring of this environmental element are listed in the Appendix No 2 to the EMP.

7.1.5 SURFACE WATER

Owing to the limited scope of the expected impacts of the Task on surface water, there is no need to conduct monitoring of biological elements during works execution and after their completion. It is also necessary to monitor relevant mitigation measures reducing impacts on surface water.

The guidelines connected to monitoring of this element of the environment are put together in Appendix No 2 to EMP.

7.1.6 GROUNDWATER

Continuous monitoring of quality of ground water is not necessary owing to the lack of potential risk of their contamination. The guidelines connected to monitoring of this element of the environment are put together in Appendix No 2 to EMP.

7.1.7 ACOUSTIC CLIMATE

Actions with regard to monitoring of acoustic climate relate to verification and compliance with recommendations resulting from issued administrative decisions, including Decisions on Environmental Conditions and mitigation measures as specified in Appendix No 1 to EMP. Monitoring should be conducted throughout the whole period of construction works. The guidelines connected to monitoring of this element of the environment are put together in Appendix No 2 to EMP.

7.1.8 NATURE

A fundamental condition outlined in the aforementioned decision is appointment of the Contractor's environmental team for the entire period of works, responsible for monitoring adverse impacts on natural habitats and habitats of species under the Community interest, as well as flora and fauna species under legal protection, which are impossible to be estimated and/or were impossible to reveal at the stage of establishing the conditions for the Task implementation. Effectiveness of the activities conducted according to the needs in order to remove external, invasive plant species, should be monitored. The guidelines connected to monitoring of this element of the environment and monitoring of actions related to reduction of impacts on the Natura 2000 sites are put together in Appendix No 2 to EMP. .

7.1.9 CULTURAL LANDSCAPE AND MONUMENTS

Monitoring shall also involve the control of implementing correct procedures in the event of discovering valuable objects including objects of a historic value as well as the performance of works under the permission of the Provincial Conservator of Historic Monuments (archaeological rescue survey). The guidelines for this element are presented in Appendix No 2 to EMP.

7.1.10 TANGIBLE ASSETS

Monitoring of protection of material goods will include checking the correct reinstatement of the previous condition (condition preceding the commencement of construction works) in the area of temporary occupation, as well as monitoring of the structures and buildings which deteriorated as a result of the works. Monitoring will also include condition of

buildings and roads at risk. The guidelines for this element are presented in Appendix No 2 to EMP.

7.1.11 HUMAN HEALTH AND SAFETY

Hazards for health and safety of people should be constantly monitored by relevant staff of the Contractor and Engineer at the stage of works implementation. The guidelines connected to monitoring of this element are put together in Appendix No 2 to EMP.

7.2 ENVIRONMENTAL MONITORING DURING OPERATIONAL PERIOD

Environmental monitoring of the development at the operation stage includes checking proper maintenance of the embankments.

8 PUBLIC CONSULTATIONS

8.1 PUBLIC CONSULTATIONS AT THE STAGE OF ENVIRONMENTAL IMPACT ASSESSMENT

In accordance with Polish EIA procedure the Task was subject to mandatory public consultations performed within the Environmental Impact Assessment at the stage of issuing the decision of environmental conditions for the Task.

For all objects within the Task, environmental decisions were issued by RDOS in Kielce. After reviewing all documents gathered for the purpose of assessing impact on the environment, RDOŚ decided that, due to insignificant impact on environment, there's no need for conducting the whole procedure of environmental impact assessment.

8.2 PUBLIC CONSULTATIONS OF THE ENVIRONMENTAL MANAGEMENT FRAMEWORK (2015)

The draft of EMF was subject to the public consultation procedure carried out in compliance with the World Bank Operational Policy OP 4.01 in order to enable the public to read the document and ensure a possibility of submitting comments and questions to its content.

The documentation of the process of social consultations is available on the website of the Odra-Vistula Flood Management Project Coordination Unit¹⁹.

8.3 PUBLIC CONSULTATIONS OF THE ENVIRONMENTAL MANAGEMENT PLAN (2016)

Draft of Environmental Management Plan (EMP) for the Contract 3B.1 Flood protection Sandomierz was subject to the public consultations carried out in accordance with the requirements of the World Bank Operational Policy (OP 4.01). Public consultations were to enable the natural persons, institutions and all interested parties to become familiar with the document and to ensure a possibility of submitting comments, questions and motions to its contents.

After completion of the draft EMP and obtaining acceptance ("no objection") of the World Bank to start the public disclosure procedure, on 28.09.2016 an electronic version of the document was published on the websites of the Świętokrzyski Board of Amelioration and

¹⁹

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

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

Hydraulic Structures in Kielce (www.szmiuw.kielce.com.pl), Sandomierz Municipality (www.sandomierz.pl) and Project Coordination Unit (www.odrapcu.pl).

Information on a possibility of reading draft EMP and submitting suggestions and comments, including contact details (e-mail address, address of a place where it was possible to read the document, office hours, telephone number) were published in the local press. The Announcement was published on 28.09.2016 in the local supplement to *Gazeta Wyborcza*. Additionally, the Announcement containing the above information (in both PL and ENG language versions) was also placed on the notice boards of Koprzywnica Commune, Samborzec Commune and Sandomierz Municipality, as well as published on the website of SZMiUW in Kielce, website of Sandomierz Municipality and on the website of PCU. The published Announcement contained also information on the venue and date of a consultation meeting within the summing up of draft EMP public disclosure (with providing the date, time, venue and purpose of the meeting).

During the period of public consultations of the draft EMP, there was information published on the website of the Marshall Office of Świętokrzyskie Province (www.sejmik.kielce.pl) on the Odra-Vistula Flood Management Project, actions implemented under Contract 3B.1 Flood protection Sandomierz and ongoing public consultations of the draft EMP. The published material included, among others, information on the possibility to become familiar with the draft document and the date, time, venue as well as the purpose of an open debate as part of public consultations of the draft EMP. A hard copy of the document was also provided and made available for inspection in the period between 28.09.2016 and 12.10.2016 (i.e. for 11 working days), at the offices of:

- Świętokrzyski Board of Amelioration and Hydraulic Structures in Kielce, Witosa Street 86, Kielce, on working days between 8:30 a.m. and 2:30 p.m.,
- Świętokrzyski Board of Amelioration and Hydraulic Structures in Kielce, Sandomierz Department, Staromiejska Street 14, Sandomierz, on working days between 8:30 a.m. and 2:30 p.m.,

During the public disclosure period there were no persons who were interested to become familiar with a copy of the document at the indicated locations. However, downloading of the files from the websites indicated in Announcement was observed.

During the public consultation, questions and comments to the content of the draft EMP were submitted via electronic mail. All comments and questions have been thoroughly reviewed by the Consultant. The Consultant provided answers and explanations to the comments, which were then sent to persons who submitted them.

After the end of the 10-working day public disclosure period of the draft EMP, there was a meeting open to all the interested parties. Meeting took place on 12.10.2016 at the Leisure and Sports Center (ul. Portowa 24, Sandomierz), at 4:00 p.m. Thirty (30) people attended the meeting. The meeting was opened by the representative of the Technical Support Consultant, who, after welcoming the gathered people, presented purpose and plan of meeting. Then representative of the Consultant presented (in the form of multimedia presentation) information on the rules of developing and functioning of

Environmental Management Plans during the implementation of the projects co-financed by the World Bank, as well as detailed data on the draft EMP for the Contract 3B.1 Flood protection Sandomierz.

Upon completing a presentation, the representative of the Consultant encouraged the public to ask questions and submit any suggestions and doubts concerning the document which was subject to public consultations. During the public debate the participants asked a few questions related to draft EMP and to execution of the construction works. The answers and explanations were provided to the audience to all the issues raised. After it was confirmed that the meeting participants received answers to all the questions, those present were thanked for attending the meeting and for their active participation. The meeting was adjourned.

During the debate, on 12th October 2016 Radio Kielce had an interview with Ms. Wanda Filip, the Head of PIU at ŚZMiUW in Kielce and Mr. Marek Bronkowski, Mayor of Sandomierz. After the interviews, on the website of Radio Kielce (www.radio.kielce.pl, Fig. 6), on the basis of the statement made by Ms. Wanda Filip, information on the actions implemented under 3B.1 Contract Flood Protection Sandomierz was provided. Moreover, information regarding other problems pointed out by Mr. Marek Bronkowski, related to managing the Vistula riverbed and its inter-embankment area in the region of Sandomierz was published as well.

Comments handed over during the draft EMP public consultations process and the public debate did not have a direct impact on the need to implement changes to the content of EMP. However, essential amendments and supplements were introduced during the final editing of the EMP.

9 EMP IMPLEMENTATION ORGANIZATIONAL STRUCTURE

The said Task constitutes a part of the Odra-Vistula Flood Management Project, co-financed from the World Bank's funds of the World Bank (3B Subcomponent Contracts). Accordingly, the structure of supervision over EMP implementation must be compliant with the provisions of the Polish law and the requirements of the World Bank.

9.1 ODRA-VISTULA FLOOD MANAGEMENT PROJECT COORDINATION UNIT

PCU is responsible for the entire coordination of the Project implementation. PCU belongs to budget units supervised by the President of the National Water Management Authority.

The PCU tasks in respect to implementation of this EMP are, as follows:

- cooperation with the Ministry of Finance, the Ministry of Interior Affairs and Administration, Ministry of the Environment, the National Water Management Authority and other bodies of government and self-government administration connected with the Project implementation;
- coordination of activities of PIU and supporting such units within EMP implementation;
- monitoring and assessment of the EMP implementation progress;
- ongoing cooperation with the World Bank, including the preparation of quarterly progress reports on the Project implementation.

9.2 PROJECT IMPLEMENTATION UNIT

An entity which is directly responsible for implementing EMP for the Task and monitoring the progress in its implementation is PIU as a regional self-government agency (ŚZMiUW in Kielce). Work of PIO and its correctness are supervised by ŚZMiUW Director.

PIO is a separate organizational cell subordinate supervised by the ŚZMiUW Director. This structure is transparent and has a high decisive level which increases the effectiveness of the Task implementation.

As part of EMP implementation, PIO fulfils the following tasks:

- monitoring of the EMP implementation progress;
- financial management and bookkeeping;

- preparing required reports for the needs of EMP implementation monitoring and coordination of its execution by all services engaged into EMP implementation;

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

- managing, coordinating, supervising over the EMP implementing by the Consultant and Contractor;
- direct supervising over the correct Task implementation;
- cooperation with the PCU;
- conducting an administration and legal supervision over EMP implementation;
- verifying the Reports and accounts of EMP implementation prepared by the Consultant and Contractor;
- conducting a financial supervision over EMP implementation;
- supervising the proper application of formal procedures during the implementation of EMP, as required by the Construction Law, Contracts, the Environmental Protection Law and other documents.

9.3 ENGINEER

The role of the Engineer is to support PIU in the effective performance of the entire Task process (from the preparation of the Task to its settlement) carried out as part of the ŚZMiUW tasks. An Engineer is appointed by means of QCBS (Quality and Cost Based Selection) method, according to the *Guidelines for the Appointment and Employment of Consultants by the World Bank Loaners*. In accordance with the scope specified in the Engineer Contract, Engineer will be obliged to perform the supervision over EMP implementation, comprising, i.a. the following:

- monitoring of EMP implementation;
- monitoring the Contractor's activities;
- verifying the quality of construction works performed by the Contractor and the construction materials, including but not limited to preventing the use of defective and not approved construction products;
- representing ŚZMiUW in Kielce in the construction site through supervising the conformity of its implementation with the design and permit to implement, environmental protection regulations and technical knowledge rules;
- supervising all the aspects connected with environmental protection through experts in environmental protection and other Engineer's personnel;

- continuous monitoring of the implementation of the mitigation measures the negative impact on the environment;
- conducting additional studies, if it is necessary to verify Contractor's reports;
- identifying problems resulting from a harmful environmental impact of the implementation of construction works on environment and presenting a proposal for solving such problems;
- checking and accepting construction works to be covered up and concealed, participating in technical tests and site acceptances of technical plants and devices as well as preparing and participating in the acceptance activities for ready construction works and putting them in service;
- confirming actually completed works and eliminating defects upon the Investor's request;
- controlling the financial settlements of the construction.

9.4 CONTRACTOR

For the purpose of performing construction works, a Contractor will be appointed who will also be responsible for implementing respective EMPs. The Contractor' responsibilities within this scope are as follows:

- conducting construction works according to the rules specified in EMP, Contract conditions and design documentation pursuant to applicable legal provisions and requirements of administrative decisions issued for the Task;
- carrying out the Engineer's recommendations (including the recommendations of experts from Engineer's environmental team and the Investor's supervision) concerning the implementation of EMP;
- ensuring the preparation of a SHPP, Waste management plan, Quality assurance plan, The construction site's flood management plan for the time of the works and Building site organisation design;
- keeping the construction site documentation;
- drafting monthly reports and technical inspection reports;
- preparing reports concerning environmental protection;
- application for the changes in the design to ŚZMiUW in Kielce if it is justified by the necessity of increasing the safety of the construction works performance or improving the construction process within the scope concerning EMP implementation.

10 EMP IMPLEMENTATION SCHEDULE AND REPORTING PROCEDURES

The implementation of EMP will allow the parties involved in the preparation, performance and supervision of Task to:

- identify different environmental aspects which have a considerable impact on the condition of the environment and therefore to control, correct, and reduce them but which, consequently, generate economic effects;
- rectifying adverse impact of the works conducted during the implementation to the benefit of the environment and financial results;
- determine the aims and tasks performed within the adopted environmental policy, covered by EMP, which require expenditure and bring tangible effects;
- identification and elimination of 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;
- reasonably use the nature's resources, with minimum environmental loss and the optimum generation of costs.

Furthermore, the implementation of recommendations and activities required by EMP may reduce or even eliminate risks involved in the Contract, in particular:

- a risk to ignore the environmental protection issues during the process of implementation of the Task by Contractors;
- a risk of the 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 incurring additional losses in the environment.

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

- before appointment of the Contractor, the Contracting Authority will submit a draft of this EMP to the World Bank in order to obtain its opinion;
- EMP will be then subject to public consultations;
- after the public consultations (and supplementing the document with the consultations results), EMP will be supplemented and submitted in its final version for the approval by the World Bank;

- upon the approval of EMP by the World Bank, a final document will be attached to the Bidding Documents for appointment of the Contractor;
- all activities of the Contractor will be systematically reported (once a month), both in Polish and in English, in paper and electronic versions, with reference to the obligations required by EMP and other contractual documents. These documents will be subject to the approval of the Engineer and the Contracting Authority.

Monitoring the environmental impact of the Task consists of:

1. Controlling execution of the construction works related to implementation of the Task under supervision of environmental team, appointed by the Contractor for the period of implementation of the Contract.

2. Environmental team, implemented by the specialists, should include:

- review and ongoing supervision of the area covered by construction and hydraulic engineering works prior to their commencement and controls during the construction project along with preparation of relevant reports, constituting documentation of due execution of environmental team and informing, at the same time, about due introduction of mitigation measures,
- if necessary, forming and reporting motions to the Engineer concerning the needs for undertaking mitigation measures (together with their implementation) necessary to alleviate adverse effects of the Task on the natural habitats and species, and their habitats being the object of interest of the Community and subject to legal (species) protection, which cannot be predicted and/or are impossible to be disclosed, at the stage of establishing conditions of implementation the above-mentioned Task as part of proceedings the purpose of which is to issue the decision on environmental conditions. The measures may be implemented only after the approval by the Engineer,
- if necessary, obtaining required permits for deviation from the prohibitions of the species of protected plants, fungi or animals according to the rules and under the procedure specified in the NEPA,
- keeping reporting in the form of periodical reports, submitted to the regional director for environment protection.

3. The Contractor's environmental team shall include the following experts: phytosociologist/botanist, herpetologist and ornithologist, chiropterologist, entomologist, and water protection expert. Every specialist must hold documented experience within an applicable scope and higher education diploma in the field of earth sciences and environment formation (higher education diploma within the following fields: environment protection, biology, forestry, ornithology, herpetology, chiropterology, entomology, phytosociology; geography, hydrology, environment protection and water protection).

Monitoring at the civil works execution stage involves the preparation of consolidated reports from monitoring of nature by the Contractor, confirmed by the experts of the Contractor's environmental team, approved by the Engineer's environmental team and approved and submitted to RDOŚ by PIU. A detailed report scope shall be defined by the Engineer (commencement report, periodical report – monthly, quarterly, ad-hoc, closure); it shall also define the due dates.

The Project reporting system will also be based on monthly reports submitted by the Contractors to PIU by the Engineer and Engineer's monthly reports. Monthly reports on EMP implementation (Contractor's or Engineer's) shall be prepared as part of monthly reports or a separate document. On this basis there will be consolidated and quarterly reports drawn-up.

PIU shall supply PCU with quarterly reports in the part referring to Task implementation. They shall include a required set of information and descriptions enabling the preparation of the Project quarterly report by PCU. Furthermore, especially in the case of problems with the Task implementation, the PCU shall expect PIU to submit the statements and data in the monthly periods.

The following reporting procedures are determined:

- 1) Reporting:
 - a) Reports (initial, monthly, quarterly, final) drawn up by the Contractor,
 - b) Report review by the Engineer,
 - c) Submission of a report to the Employer (for information),
 - d) Submission of a report to RDOŚ in Kielce (only within the scope required by the environmental decision),
 - e) Submission of a PIU's quarterly report to PCU.
- 2) Archiving:
 - a) Contractor: 1 copy of each report in an electronic version form for 5 years from the date of the Contract completion,
 - b) Engineer: 1 copy of each report in an electronic version form for 5 years from the date of the Contract completion,
 - c) The Employer: 1 copy of each report in an electronic version form for 5 years from the date of the Contract completion.
- 3) Evaluation - on-going assessment of the outcomes of the planned activities implementation which arise from EMP. Ongoing analysis of documentation (the Reports of the Contractor of the works) by the Engineer. Providing the Employer with reliable information on the course of the construction process, including the fulfilment of activities limiting the adverse impact on the environment and recommendations arising from environmental decisions.

PCU shall also prepare quarterly reports and submit them to the World Bank.

The following is planned:

- *ex-ante* evaluation: Report prior to the commencement of the Contract execution for the works (Engineer's Report),
- ongoing evaluation: Engineer's quarterly reports,
- *ex-post* evaluation:
 - ✓ Report upon the completion of the Contract performance (EMP final reports drawn up by the Contractor and the Engineer),
 - ✓ EMP Report upon expiry of the Defects Notification Period drawn up by the Engineer.

11 SOURCE MATERIALS

- Borecka A., Kaczmarczyk R., 2005. Surface Mass Movements in Loess Formations of the Lublin Region and in the Area of Sandomierz. In: Mat. seminar: "Registration and Inventory-taking of Natural Geological Hazards (with Particular Focus on Landslides and Other Geodynamic Phenomena) Across the Whole Country", Krakow, 23.11.2005, pp.35-36
- Directive of the European Parliament and the Council 2009/147/EC of 30th November 2009 on protection of wild birds.
- The Directive of the Council no. 92/43/EEC of 21st May 1992 on conservation of natural habitats as well as wild fauna and flora
- Directive 2000/60/EC of the European Parliament and Council of October 23rd, 2000 establishing a framework for Community action in the field of water policy
- <http://www.krakow.rzgw.gov.pl>; the list of the uniform surface water at risk of failure to reach the environmental purpose up to 2015.
- Ilczewicz Stefaniuk Danuta, Stefaniuk Michal, 2007, Landslide Processes in the Vistula River Valley, Geologos (11)
- Restoration plan for Zajeziorko for the years 2012-2018 (http://www.samborzec.pl/asp/pliki/pobierz/plan_odnowy_miejscowosci_Zajeziorko.pdf).
- Collective Work, 2004, Best Available Techniques (BAT). The guidelines for Glass Industry, Ministry of Environment, Warsaw
- Environmental and Social Management Framework for Odra-Vistula Flood Management Project – in Polish: http://www.odrapcu.pl/popdow_dokumenty.html,
- Environmental and Social Management Framework for Odra-Vistula Flood Management Project - English language version: http://www.odrapcu.pl/doc/OVFMP/RPZSiS_Zalacznik_08_Raporty_z_procedury_u_publicznienia_projektu_EMAF.pdf.
- Demographic Yearbook 2015. Main Statistical Office (GUS), Warsaw.
- Siudak R., Springer N., Siudak K., 2009: Environmental Protection Program for the Commune of Sandomierz for the Years 2009 - 2016, Sandomierz
- Study of the Conditions and Directions of Spatial Development of the City of Sandomierz, Resolution No.XXV/163/2000 of the Municipal Council of Sandomierz of 24 February 2000, amended by Resolution No. XL/344/2009 of 28 October 2009 on change to the Study of the Conditions and Directions of Spatial Development of the City of Sandomierz - Stage 2

- Study of the Conditions and Directions of Spatial Development of the Commune of Samobrzec, Resolution No. IV/18/02 of the Commune Council of Samobrzec of 30 December 2002, amended by Resolution No. XXIV/94/08 of 30 June 2008 on amendments the study of the conditions and directions of spatial management of the commune Samobrzec
- Study of the Conditions and Directions of Spatial Development of the City and Commune of Koprzywnica, Resolution No. XXXVII/181/02 of the Municipal Council in Koprzywnica of 4 October 2002, amended by Resolution No. XLVI/210/10 of the Municipal Council of Koprzywnica of 27 October 2010 and by Resolution No. XL/201/2013 of the Municipal Council of Koprzywnica of 20 November 2013
- Operational Policies of the World bank in the scope of:
 - environmental impact assessment: OP 4.01
<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,contentMDK:20064724~menuPK:64701637~pagePK:64709096~piPK:64709108~theSitePK:502184,00.html>,
 - natural habitats OP 4.04
<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTSAFEPOL/0,,contentMDK:20543920~menuPK:1286576~pagePK:64168445~piPK:64168309~theSitePK:584435,00.html>
 - physical cultural assets OP/BP 4.11
<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,contentMDK:20970737~menuPK:64701637~pagePK:64709096~piPK:64709108~theSitePK:502184~isCURL:Y,00.html>

12 APPENDICES

APPENDIX NO 1 - PLAN OF MITIGATION MEASURES

APPENDIX NO 2 - PLAN OF MONITORING MEASURES

APPENDIX NO 3 - LIST OF NATIONAL LEGAL ACTS CONNECTED WITH ENVIRONMENTAL PROTECTION

APPENDIX NO 4 - COPIES OF THE FINAL ADMINISTRATIVE DECISIONS ISSUED FOR THE TASK (WITH REGARD TO THE CONTRACT 3B.1)

- Decision of the Regional Director for Environmental Protection in Kielce of 19 July 2013 on the environmental conditions of the project entitled „Flood control of the right-bank part of Sandomierz – land drainage in the fork of the Vistula River and Trześniówka River. Task 1: Flood protection within the mouth section of the Atramentówka River, construction of a new pumping station "Koćmierzów" and of a gravitational lock in Koćmierzów (in the right embankment of the Vistula River) and of a channel draining water from the Atramentówka River to the pumping station" (ref. no. WOO-I.4233.2.2013.AM.11)
- Decision of the Regional Director for Environmental Protection in Kielce of 18 October 2013 on the environmental conditions of the project entitled „Flood control of the right-bank part of Sandomierz – land drainage in the fork of the Vistula River and Trześniówka River. Task 2: Flood protection within the area of the Struga A watercourse together with an alteration and expansion of the pumping station "Nadbrzezie" (ref. no. WOO-I.4233.3.2013.AM.20);
- Decision of the Regional Director for Environmental Protection in Kielce of 12 December 2014 on the environmental conditions of the project entitled "Expansion of the surrounding embankment protecting Glass Factory and a Housing Estate against the flood waters in the town of Sandomierz along with the concept of the protection of Port" (Ref. no. WOO-I.4233.5.2014.KT.10)
- Decision of the Regional Director for Environmental Protection in Kielce of 25 October 2013 on the environmental conditions of the project entitled "Protection of Koprzywianka River embankments - left at km 0+000 ÷ 12+900, right at km 0+000 ÷ 14+400" (ref. no. WOO-I.4233.1.2013.AM.20)
- Decision of the Regional Director for Environmental Protection in Kielce of 30 June 2014 on the environmental conditions of the project entitled "Construction of the water pumping station in Szewce" commune Samborzec (ref. no. WOO-I.4233.3.2014.KT.8)
- Decision of the Regional Director for Environmental Protection in Kielce of 30 June 2014 on the environmental conditions of the project entitled "Expansion of the water pumping station in Zajeziarze" commune Samborzec (ref. no. WOO-I.4233.4.2014.MM.6)

APPENDIX NO 5 – LOCATION MAP OF THE TASK

APPENDIX NO 6 - LOCATION MAP OF THE TASK ON THE BACKGROUND OF DESIGNATED AREAS AND THE NATURA 2000 NETWORK

APPENDIX NO 7 - POTENTIAL FLOOD DANGER AREAS

APPENDIX NO 8 – TERRAINS EXCLUDED FROM AREAS OF POTENTIAL FLOOD RISK