ENVIRONMENTAL IMPACT ASSESSMENT OF THE GDANSK WATER AND WASTEWATER PROJECT

MARCH 2006

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March 2006

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1. INTRODUCTION

The object of the Environmental Impact Assessment Statement presented herein is the Gdansk Water and Wastewater project, whose main goal is to adapt the Gdansk city water supply and sewage system to the city sustainable requirements and particularly:

- Supply of drinking water to the inhabitants of Gdansk, of quality compliant with Polish and EU regulations.
- Improvement of waste water management in order to reduce the load of pollutants discharged into the Baltic Sea to ensure the ecological restoration of the Baltic Sea and preservation of its ecological balance.
- Development of a sustainable, economic and environmentally acceptable long term sludge management system.
- Connection of nearly all water intakes to the main distribution system to improve security of supplies and flexibility of operation.
- Extension of the sewerage network to areas of Gdansk that are not connected at present.

The main document of the European Union with respect to water management is the Framework Water Directive 2000/60/EC, enacted on 23 October 2000, whose main purpose is to establish a framework for activities for the protection of inland surface waters, transitional waters, coastal waters and groundwater, including those contributing to the protection of territorial and marine waters, and achieving the objectives of relevant international agreements, including those which aim to prevent and eliminate pollution of the marine environment by Community action under Article 16(3) to cease or phase out discharges, emissions and losses of priority hazardous substances, with the ultimate aim of achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances.

The *National environmental policy for 2003-2006 with an outlook for 2007-2010*, prepared as an implementation of the provisions of the act of April 27, 2001 on the Environmental Protection Law, is the strategic document in the area of environmental protection in Poland. Strategic areas of activity related to water protection set in the plan are:

- restoring surface and subsoil water quality to the level appropriate for its planned use and for its environmental functions;
- restructuring utility water intakes in such a manner, that subsoil water is used exclusively for the needs of the population, such as drinking water and materials for the food industry, while

surface water is used primarily for the needs of agriculture, industry, and the power industry, while maintaining its recreational value;

- building retention tanks and creating small retention to equalize the rivers' flow and to rationally manage the rainwater confluence;
- maintaining natural retention tanks, mainly as part of the activities leading to the protection of biological diversity and sustainable forest management;
- protection of surface and sea water from eutrophication;
- protection of the Upper Wisła and the Upper Odra waters from the salinity of the mine water.

The principles set in the Framework Water Directive 2000/60/EC and the National Environmental Policy are addressed through several programs at the National, regional and local levels.

In the provisions of the *National program for municipal wastewater treatment*, the main goal of wastewater disposal and treatment in Poland is to implement collective sewage and wastewater treatment systems within densely developed areas. Referring to Directive 91/271/EEC, this program lists investments, along with their execution deadline, which are necessary to implement the provisions of the Accession Treaty. Among others it states that it will be necessary to ensure a 75% reduction of the total load of nitrogen and phosphorus in municipal wastewater coming from the entire country in order to protect surface water, including sea water, from eutrophication. According to the act, this term covers water used for water withdrawal by municipal water systems supplying the population with water, water protected for environmental reasons and water vulnerable to eutrophication, including water of the Wiślany Bay, Gdańsk Bay, and Szczeciński Bay.

At the regional level, the basic document outlining trends in the development of the pomorskie voivodship is *The development strategy for the pomorskie voivodship*, whose objectives with respect to water management are:

1. to equalize the standards of water and sewage equipment between urban and rural areas
2. to fully meet the quantity needs, resulting from the necessity to maintain permanent water supply in highly developed as well as in rural areas
3. to systematically improve the quality of water delivered to recipients, meeting the European requirements, norms, and standards
4. to rearrange protection zones for underground water intakes
5. to enable the completion of investments necessary to maintain the quality of water in the Radunia river (protection zone for the Straszyn water intake)

6. to organize disposal and treatment of wastewater from all households in the voivodship, in accordance with the environment protection norms and required levels for the purity of surface water
7. to install equipment for water supply simultaneously with equipment for wastewater collection and treatment
8. to radically decrease the load of pollutants discharged into water and earth
9. to improve the quality of flowing, standing, and underground water
10. to create optimal flood protection conditions.

Development goals, principles, and trends for the voivodship have been defined in a document called *Pomorskie voivodship development plan* passed in Resolution No 639/XLVI/02 by the Pomorskie Voivodship Regional Council on 30 September 2002. The central goal of the development policy is to create a harmonious functional-spatial structure throughout the voivodship, promoting sustainable use of spatial features, resources, and conditions for economic development, improvement of life quality, and permanent preservation of the environment for the needs of the current and future generations.

The goals, trends, and tasks for environmental protection defined in the National Environmental Policy, in the Development Strategy for Pomorskie voivodship, and the Development Plan for Pomorskie voivodship are reflected in the *Program for environmental protection in the Pomorskie voivodship for 2003-2006 with a perspective for 2007-2010* (resolution No. 153/XIII/03), passed on 29 September 2003 by the Regional Council of Pomorskie voivodship in Gdańsk.

These principles and goals are also collected in a series of documents that shape the local strategy within the neighbouring municipalities.

The Gdańsk Water and Wastewater Project will ensure that the requirements set by the Polish and European Union policies are met, and at the same time allows to fulfil Polish obligations resulting from the Convention on the Protection of the Marine Environment of the Baltic Sea Area.

The project itself consists of a total of 28 water and wastewater investments, all of which will be implemented in the city of Gdańsk, except one, which will be located in the neighbouring commune of Kolbudy. These investments are grouped as follows:

- 17 seventeen water supply treatment and distribution projects:
    - Metering and monitoring system for Gdańsk Water Supply System.
    - Construction of Kiełpino reservoir and rehabilitation of Migowo pumping station and water main connecting Kiełpino reservoir with central water supply network

- Construction of Osowa treatment station and reservoir
- Construction of Gdansk to Osowa trunk water main
- Reconstruction of Lipce water treatment station and intakes
- Construction of water main to supply Orunia-Olszynka from Lipce
- Separate treatment of Pregowo water
- Construction of water main for Gdansk-Poludnie quarter
- Development of water treatment station Zaspa Wodna
- Rehabilitation of Dolina Radosci water intake and treatment station
- Water supply for Kokoszki-Bysewo area
- Construction of water pipeline in Zulawy area – Olszynka
- Recommissioning of Stara Dolina reservoir
- Construction of Zakoniczyn intake and water treatment station
- Rehabilitation of Ptasia water pumping station
- Construction of pumping station and reservoirs at Orunia
- Construction of network and pumping station Sobieski

- 9 sewage network projects in Osowa-Barniewice-Klukowo, Zabornia, Jasień Wieś, Łostowice, Sobieszowska Island, Orunia, Olszynka, Kiełpino Górne, Święty Wojciech quarters
- 1 project investment related to the closure of Zaspa WWTP with 3 sub tasks:
  - Reversal of the Zaspa WWTP sewerage system
  - Construction of second pumping main to Wschod WWTP
  - Demolition of Zaspa WWTP
- 1 project related to the modernisation of Wschod WWTP, including:
  - measures to meet the required total N effluent standard
  - measures designed to improve biogas production in the digestion process together with the combined heat and power plant to achieve 100% utilisation of the biogas,
  - sludge management measures including thermal drying of sludge,

- other works including modernisation of existing open digestion tanks and washing facilities for contaminated sludge from gullies.

In order to finance these investments, the City of Gdansk is applying for Cohesion funding. As required by the Cohesion Fund guidelines, all application or the Fund's assistance must include documentation concerning assessment of the project's environmental impact according to the requirement of Directive 85/337/EEC as amended by Directive 97/11/EC (referred to as the EU EIA Directive as amended). Pursuant to European Court of Justice (ECJ), the EU EIA Directive as amended is directly applicable, and Cohesion Fund projects can only be approved by the European Union (EU) if they meet the EU EIA Directive requirements.

Since January 1st 2005 it was established an asset holding company, known as "Gdanska Infrastruktura Wodociągowo Kanalizacyjna" Sp. z o.o. – GIWK, which took over all water and wastewater infrastructures in Gdansk. Consequently, GIWK also took over the "Gdansk Water and Wastewater Project" for its implementation and became a beneficiary of Cohesion Found.

In addition, the GIWK has requested the European Bank for Reconstruction and Development (EBRD) to participate in the co-financing of this project. Accordingly with its policy, the EBRD requires that projects be structured so as to meet applicable national environmental law, and EU environmental standards, insofar as these can be applied to a specific project.

The project will result in the development of a new large collector running through the city, the closure of an existing WWTP and the extension of another, water treatment stations, and new water mains and reservoirs. Although the project will result in the benefits stated above, the implementation of the project may result in environmental impacts. It is therefore, necessary to undertake an assessment of all the impacts that may affect the environment and ensure that the project will not result in significant adverse environmental impacts by including all necessary mitigation measures to minimise any adverse impact.

Although Poland has a long track record in EIA procedures, in the past, the EU has been concerned with the Polish approach to screeening of Annex II projects and assessing the impacts on Natura 2000 sites, including those listed on the so called "shadow list" prepared by NGOs. This situation, however, has recently changed with amendments to the Polish Environmental Protection Law, and one of the aims of this EIA has been to check that appropriate screening is undertaken.

Since the EU requires that the impacts of the entire project are assessed and not just its individual elements, as it is done under current Polish EIA procedure, an EIA such as the one presented herein is required that encompasses all of the concerns listed, and be fully in compliance with the EU EIA Directive as amended as well as Polish environmental regulations.

The EIA statement presented herein identifies relevant Polish and European legislation as well as international treaties. After reviewing the EIA procedure, an analyses of the screening process carried out for each of the project's tasks has been undertaken. The EIA also includes a scoping study to establish the main features the proposed water and wastewater projects in order to identify the environmental key issues to be taken into account in the environmental assessment process. As part of the scoping process, a draft Public Consultation and Disclosure Plan (PCDP) has been prepared, including consultation meetings, one of which will be held once this EIA statement has been subject to public consultation. The environmental baseline for this EIA has been largely based on data already gathered and available through local governmental and non-governmental organizations. The process of impact assessment has been based on the identification of the activities/aspects of the project and the environmental components, which could be affected by those activities/aspects. Quantitative approaches have been used when possible, otherwise qualitative approaches based on expert opinion have been used. Finally, mitigation measures are identified and a monitoring plan has been proposed.

The level of detail of the EIA has been determined by the available environmental information and the available design information. Thus, with regards to design information, some of the projects are applying for a building permit or a permit has already been granted and consequently detailed technical documentation for the task is available, but other the projects do not have detailed design and are even at the conceptual stage. Another objective of the EIA in this regard is to ensure that the detailed design is aware of environmental key issues to be introduced in the design The EIA however, will not develop detail of design issues beyond that provided by GIWK.

2. LEGISLATION AND PROJECT STANDARDS

The following information with regards to the environmental protection legislation related to the Gdansk Water and Wastewater Project has been extracted from the Jacobs Gibb report and updated with the most recent modifications in legislation.

2.1 INTERNATIONAL OBLIGATIONS

2.1.1 Convention on the Protection of the Marine Environment of the Baltic Sea Area

The Convention on the Protection of the Marine Environment of the Baltic Sea Area has been adopted in Helsinki on 9th April 1992. The Republic of Poland is a State bordering the Baltic Sea and a party signatory of this Convention.

The most important premises for signature of the Convention were:

- consciousness of the indispensable values of the marine environment of the Baltic Sea Area, its exceptional hydrographic and ecological characteristics and the sensitivity of its living resources to changes in the environment,
- firm determination to assure the ecological restoration of the Baltic Sea, ensuring the possibility of self-regeneration of the marine environment and preservation of its ecological balance,
- conviction that the protection and enhancement of the marine environment of the Baltic Sea Area are tasks that cannot effectively be accomplished by national efforts clone but by close regional co-operation and other appropriate International measures.

The Convention shall apply to the protection of the marine environment of the Baltic Sea Area which comprises the water-body and the seabed including their living resources and other forms of marine life. The Contracting Parties have declared that they should individually or jointly take all appropriate legislative, administrative or other relevant measures to prevent and eliminate pollution in order to promote the ecological restoration of the Baltic Sea Area and the preservation of its ecological balance.

The following principles concerning pollution from land-based sources have been adopted:

1. The Contracting Parties undertake to prevent and eliminate pollution of the Baltic Sea Area from land-based sources by using, *inter alia*, Best Environmental Practice for all sources and Best Available Technology for point sources. The relevant measures to this end shall be taken by each Contracting Party in the catchment area of the Baltic Sea without prejudice to sovereignty.

2. The Contracting Parties shall implement following procedures and measures:

2.1. Municipal sewage water shall be treated at least by biological or other methods equally effective with regard to reduction of significant parameters. Substantial reduction shall be introduced for nutrients.

2.2. Water management in industrial plants should aim at closed water systems or at a high rate of circulation in order to avoid waste water wherever possible.

2.3. Industrial waste waters should be separately treated before mixing with diluting waters.

2.4. Waste waters containing hazardous substances or other relevant substances shall not be jointly treated with other waste waters unless an equal reduction of the pollutant load is achieved compared to the separate purification of each waste water stream. The improvement of waste water quality shall not lead to a significant Increase in the amount of harmful sludge.

2.5. Limit values for emissions containing harmful substances to water and air shall be stated in special permits.

2.6. Industrial plants and other point sources connected to municipal treatment plants shall use Best Available Technology in order to avoid hazardous substances which cannot be made harmless in the municipal sewage treatment plant or which may disturb the processes in the plant. In addition, measures according to Best Environmental Practice shall be taken.

3. Harmful substances from point sources shall not, except in negligible quantities, be introduced directly or indirectly into the marine environment of the Baltic Sea Area, without a prior special permit.

2.1.2 Aarhus Convention

The objective of the Aarhus Convention is to guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters, in order to protect people's rights to a healthy environment. The Convention entitles the public to participate in environmental decision-making concerning a wide range of economic activities, not only those covered by EIA procedures.

The Aarhus Convention is addressed in Directive 2003/35/EC of 26 May, providing for public participation in respect of the drawing up of certain plans and programmes relating to environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC.

During the IV Ministerial Conference called *Environment for Europe* organized by the European Economic Commission NZ (UNECE) in Aarhus in Denmark, a Convention was proposed on June 25, 1998 which guarantees public access to information, participation of the public in the decision making

process and access to justice in matters relating to the environment. The convention entered into force on October 30, 2001. The Republic of Poland is a signatory of this Convention and ratified it on December 31, 2001. Full text of the Convention was published in the Official Journal (2003, no 78, item 706).

2.2 EUROPEAN LEGISLATION

According to Directive 85/337/EEC on Environmental Impact Assessment, amended with Directive 97/11/EC, all investments having a significant environmental impact, must implement a procedure of assessing the environmental impact.

With regards to specific goal of the project, the main document of the European Union with respect to water management is the Framework Water Directive 2000/60/EC, enacted on 23 October 2000. A document, which identifies the principles for the implementation of this Directive, is the Common Implementation Strategy RDW of 2 May 2001. This Directive governs all aspects of water management and its provisions will replace, after a set transition period, earlier directives, namely Directive 78/659/EEC on water quality for fish, and Directive 76/464/EEC on pollution caused by some substances discharged into the water environment.

The main purpose of the Water Framework Directive is to establish a framework for activities for the protection of inland surface waters, transitional waters, coastal waters and groundwater, including those contributing to the protection of territorial and marine waters, and achieving the objectives of relevant international agreements, including those which aim to prevent and eliminate pollution of the marine environment by Community action under Article 16(3) to cease or phase out discharges, emissions and losses of priority hazardous substances, with the ultimate aim of achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances.

Other pieces of European legislation relevant to this EIA are:

- Directive 98/83/EC on the quality of drinking water, adopted by the Council on 3 November 1998.
- Directive 76/160/EEC on bathing water quality, which determines the quality of water in bathing places, including seaside bathing places.
- Directive 98/15/EC amending Directive 91/271/EEC on municipal wastewater treatment plants.
- Directive 86/278/EEC on wastewater sludge.

- Framework Directive 75/442/EEC on Waste, amended with Council Directive 91/156/EEC, Council Directive 91/692/EEC, and a decision of the Commission 96/350/EC.
- Council Directive 91/689/EEC of 12 December 1991 on hazardous waste. Amended by Commission Directive 94/31/EC of 27 July 1994.
- Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.

2.3 POLISH ENVIRONMENTAL PROTECTION POLICY

2.3.1 Outline of Polish Environmental Protection Policy

The newest strategic document in the area of environmental protection is the *National environmental policy for 2003-2006 with an outlook for 2007-2010*, prepared as an implementation of the provisions of the act of April 27, 2001 on the environmental protection law. This document updates and provides details for the "II National Environmental Policy", adopted by the Sejm of the Republic of Poland in August, 2001.

The main goal of the national environmental policy is to assure the environmental safety of the Polish society in the twenty first century, and to create the foundation for the preparation and implementation of a sustainable development strategy in the country. The process of integration with the European Union greatly supports all activities designed to reach the main objective of the new national policy.

The overriding principle of the Polish environmental policy of the country is the principle of sustainable development included in the Constitution of the Republic of Poland.

The strategic interests of the environmental policy are the following:

- to exercise such influence on the macroeconomic policy so that it becomes conducive to making the development of the country fit the sustainable development model;
- to adapt policies adopted for different sectors to the task of sustainable management and protection of natural resources as well as to the implementation of pro-environmental manufacturing patterns in all sectors of the economy;
- to improve the quality of the environment in all of its elements and all the specific areas within the country (cities and settlements, especially including degraded areas);
- to limit the pressure of consumption on the environment;
- to make information on the environment accessible for the society, to involve the public in the decision making process, and in court proceedings pertaining to environmental protection issues;

- to assure that the Polish environmental policy complies with the trends and the scope of activities adopted by the European Union in its environmental policy as well as to identify ways and means necessary to meet the EU membership requirements;
- to promote sustainable development through international contacts.

2.3.2 Outline of the Regional and Local Strategy

The basic document outlining trends in the development of the pomorskie voivodship is called "The development strategy for the pomorskie voivodship". This document includes the following vision of the pomorskie voivodship: *"The pomorskie voivodship of 2010 is a region of new, well exploited opportunities and partnership cooperation – with a strong and diverse economy and a clean environment, it will maintain its seafaring traditions and cultural diversity, making a transition into a fast development based on abilities and knowledge."*

The above vision translates into a mission statement, which forms a detailed plan of how to execute the vision. The mission statement identifies the following basic principles to execute this vision:

- the sustainable development strategy,
- the focus on human resources principle,
- diversified development principle,
- the principle of protection of market processes, strengthening and creating new markets,
- the public-private partnership principle,
- the principle of regional differentiation of objectives and instruments,
- the principle of conversion.

Development goals, principles, and trends for the voivodship have been defined in a document called "Pomorskie voivodship development plan" passed in Resolution No 639/XLVI/02 by the Pomorskie Voivodship Regional Council on September 30, 2002. A draft of the plan along with a "Predicted environmental impact of the project's execution" was made available, in a publicly accessible registry of documents with environmental data, on the voivodship self-government Internet site. The plan was also displayed for public viewing; it was subjected to a complex procedure of social consultations during sub-regional conventions, discussion and judgement, as provided by law. These proceedings influenced its contents and provisions.

The central goal of the development policy is to create a harmonious functional-spatial structure throughout the voivodship, promoting sustainable use of spatial features, resources, and conditions

for economic development, improvement of life quality, and permanent preservation of the environment for the needs of the current and future generations.

This central goal will be achieved in the course of executing the following main objectives:

1. Making a connection with the European, including the Baltic, land management system
2. Increasing the competitiveness of the Pomeranian region and the effectiveness of land management
3. Achieving the life quality (civilization standard) of people living in the western part of Baltic Europe
4. Restraining the degradation of the environment and protecting its structure and value
5. Improving defence strength and resistance to consequences of failures and natural disasters

On September 29, 2003 the Regional Council of Pomorskie voivodship in Gdańsk passed a document called "Program for environmental protection in the Pomorskie voivodship for 2003-2006 with a perspective for 2007-2010" (resolution no 153/XIII/03).

This document reflects the goals, trends, and tasks for environmental protection defined in the National Environmental Policy, in the Development Strategy for Pomorskie voivodship, and the Development Plan for Pomorskie voivodship. This document was subjected to broad consultations and judgement and constitutes a strategic document for environmental management within the Pomorskie voivodship.

Finally, the documents shaping the local strategy within the neighbouring municipalities, which belong to the reception basin of the Wschód wastewater treatment plant are as follows:

- The most important document setting the development strategy for the City and Municipality of Żukowo is entitled *Development Strategy for the Municipality of Żukowo until 2012*, prepared between April and July of 2002.
- The most important trends for the local development of the Kolbudy Municipality are set in the following two documents:
  - *Development Strategy for the Kolduby Municipality for 1999-2015*,
  - *A study of the conditions and trends in the land use and management for 1999-2015 for the Kolbudy Municipality*.
- The most important document setting the development strategy for the City of Pruszcz Gdański is entitled *Development Strategy for the City of Pruszcz Gdański until 2010*, passed by the City Council as bill no XXXIII/258/2001 on May 30, 2001. The Municipality of Pruszcz Gdański does not have a separate strategic document.

- Priorities for the local development of the City of Sopot have been defined in a document called *A strategic plan for the City of Sopot* passed by the City Council as bill No. XXXIII/523/2002 on June 21, 2002.

2.3.3 Polish Applicable Legislation

In recent years while adapting the Polish law to the EU legal system, all basic legal acts on environmental protection in Poland have been changed. Currently, the fundamental legal act in this area is the Act of April 27, 2001 known as Environmental Protection Law, modified by the Act of 18 May 2005 on changes in the Environmental Protection Law and in other acts. The Act sets the general terms and basic definitions, which also apply to other acts regulating environmental aspects.

The following acts apply to this project in question:

- The Act of 27 April 2001, Environmental Protection Law (Official Journal, No 62, item 627)
- The Act of 18 May 2005 on changes in Environmental Protection Law and in other acts (Official Journal, No 113, item 954)
- The Act of 18 July 2001, The Water Law Act (Official Journal, No 115, item 1229)
- The Act of 19 December 2002 on changes in The Water Law Act and in other acts (Official Journal, No 130, item 1087)
- The Act of 27 March 2003 on land use and management planning (Official Journal, No 80, item 717)
- The Act of 7 July 1994, The Building Law (uniform text: Official Journal of 2000, No 106, item 1126).
- The Act of 27 April 2001 on waste (Official Journal, No 62, item 628)
- The Act of 19 December 2002 on changes in the act on waste and in other acts (Official Journal of 2003, No 7, item 78)
- The Act of 16 April 2004 on the protection of nature (Official Journal, No 92, item 880).
- Decree of Council of Ministers of 9 November 2004 on types of projects which may have significant impact on the environment and specific conditions related to classifying the measures for environmental impact assessment preparation (Official Journal No 257, item 2573)
- Decree of Council of Ministers of 10 May 2005 on changes in decree on types of projects which may have significant impact on the environment and specific conditions related to

classifying the measures for environmental impact assessment preparation (Official Journal No 92, item 769)

- Decree of Minister of Environment of 21 July 2004 on Special Protection Areas within Natura 2000 network (Official Journal No 229, item 2313)
- The Act of 7 June 2001 on collective supply in water and collective wastewater disposal (Official Journal, No 72, item 747)
- The Act of 8 March 1990 on municipal self government (uniform text: Official Journal of 2001, No 142, item 1591)
- The Act of 13 September 1996 on maintaining cleanness and order within municipalities (Official Journal, No 132, item 622)
- The Act of 20 April 2004 on changes and rescind some of Acts in relation to RP accession to the European Union (Official Journal, No 96, item 959 dated 30 April 2004)

The process of changing the legal system is still ongoing. The executory regulations are being prepared for the new acts. The following decrees need to be taken into consideration**:**

- Decree of Minister of Infrastructure of July 3, 2003 on the specific scope and form of the building design (Official Journal, No 120, item 1133)
- Decree of Minister of the Environment of November 27, 2002 on requirements to be met by surface waters used for supply of people with water for consumption (Official Journal, No 204, item 1728)
- Decree of Council of Ministers of November 9, 2004 on types of projects which may have significant impact on the environment and specific conditions related to classifying the measures for environmental impact assessment preparation (Official Journal No 257, item 2573).
- Decree of Minister of the Environment of July 28, 2004 on conditions to be met when discharging sewage into water or into soil and for agricultural use of sewage; place and frequency of sewage sample collection, reference analysis methods, and method of evaluation if the sewage are in compliance with requirements; substances hazardous and particularly hazardous for the water environment (Official Journal, No 168, item 1763)
- Decree of Minister of Infrastructure of July 28, 2004 on definition of methods and basis for investment cost calculation preparation, calculation of estimated design costs and construction costs defined in functional specification (Official Journal No 130, item 1389)

- Decree of Minister of Health of October 16, 2003 on the requirements for baths water (Official Journal No 183, item 1530)
- Decree of Minister of the Environment of October 4, 2002 on the requirements for inland waters, which are inhabited by fish in natural conditions (Official Journal, No 176, item 1455)
- Decree of Minister of Infrastructure of July 20, 2002 on fulfilling the duties of industrial waste disposal providers and conditions for discharging sewage into the devices of the sewage system (Official Journal, No 129, item 1108)
- Decree of Minister of Infrastructure of January 14, 2002 on description of average water consumption standards (Official Journal No 8, item 70)
- Decree of Minister of Health of November 19, 2002 on requirements concerning water quality for consumption by people (Official Journal, No 203, item 1718)
- Decree of Minister of Infrastructure of October 17, 2002 on conditions for discharging liquid refuse into reception stations (Official Journal, No 188, item 1576)
- Decree of Minister of Infrastructure of March 12, 2002 on tariff calculation, application form for tariff approval and rules for collective water supply and sewage collection accounts (Official Journal No 26, item 257)
- Decree of Minister of the Environment of August 1, 2002 on municipal sewage sludge (Official Journal, No 134, item 1140)
- Decree of Minister of Environment of July 8, 2004 on conditions, which must be fulfilled during discharge of wastewater or water into waters or soils and on compounds especially hazardous for water environment (Official Journal, No 168, item 1763)

3. THE EIA PROCEDURE

3.1 GENERAL EIA PROCEDURE ESTABLISHED BY EU DIRECTIVES

EIA is a procedure required under the terms of Directive 97/11/EC amending Directive 85/337/EEC on assessment of the effects of certain public and private projects on the environment. Article 2 requires that "Member States shall adopt all measures necessary to ensure that, before consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regards to their effects." Article 8 then requires that "The results of consultations and information gathered pursuant to (the EIA procedure) must be taken into consideration in the development consent procedure."

As indicated in the document "Guidance on EIA" prepared by the EU Commission (June 2001), these requirements are elaborated further in the Directive and in the EIA systems introduced in each Member State. The guide indicates that these requirements vary in their details, but the practical stages in most EIA systems are generally the ones indicated in the following table, where those stages which are mandatory under the terms of the Directive are highlighted in bold. Other steps, including the formal review of environmental information before it is used for decision-making, are part of good practice in EIA, and have been adopted in some Member States but not all.

PROJECT PREPARATION	The developer prepares the proposals for the project
NOTIFICATION TO COMPETENT AUTHORITY	In some MS there is a requirement for the developer to notify the competent Authority in advance of the application for development consent. The developer may also do this voluntarily and informally.
SCREENING	The competent authority makes a decision on whether EIA is required. This may happen when the competent authority receives notification of the intention to make a development consent application, or the developer may make an application for a Screening Opinion. The Screening decision must be recorded and made public.
SCOPING	The Directive provides that developers may request a Scoping Opinion from the competent authority. The Scoping Opinion will identify the matters to be covered in the environmental information. It may also cover other aspects of the EIA process. In preparing the opinion the CA must consult the environmental authorities (Article 5(2)).
ENVIRONMENTAL STUDIES	The developer carries out studies to collect and prepare the environmental information required by Article 5 of the Directive.

SUBMISSION OF ENVIRONMENTAL INFORMATION TO COMPETENT AUTHORITY	The developer submits the environmental information to the competent authority with the application for development consent. If an application for an Annex I or II project is made without environmental information the competent authority must screen the project to determine whether EIA is required (Articles 5(1) and 5(3)).
REVIEW OF ADEQUACY OF THE ENVIRONMENTAL INFORMATION	In some Member States there is a formal requirement for independent review of the adequacy of the environmental information before it is considered by the competent authority. In other Member States the competent authority is responsible for determining whether the information is adequate.
CONSULTATION WITH STATUTORY ENVIRONMENTAL AUTHORITIES, OTHER INTERESTED PARTIES AND THE PUBLIC	The environmental information must be made available to authorities with environmental responsibilities and to other interested organisations and the general public for review. They must be given an opportunity to comment on the project and its environmental effects before a decision is made on development consent. If transboundary effects are likely to be significant other affected Member States must be consulted (Articles 6 and 7).
CONSIDERATION OF THE ENVIRONMENTAL INFORMATION BY THE COMPETENT AUTHORITY BEFORE MAKING DEVELOPMENT CONSENT	The environmental information and the results of consultations must be considered by the competent authority in reaching its decision on the application for development consent (Article 8).
ANNOUNCEMENT OF THE DECISION	The decision must be made available to the public including the reasons for it and a description of the measures that will be required to mitigate adverse environmental effects (Article 9).
POST-DECISION MONITORING IF PROJECTS IS GRANTED CONSENT	There may be a requirement to monitor the effects of the project once it is implemented.

3.2 THE EIA PROCEDURE IN POLAND

The environmental impact assessment procedure in Poland is regulated by the Environmental Protection Law Act of 27 April, 2001 (Official Journal No.62, item 627 with amendments), and the Act of 18 May, 2005 on changes in The Environmental Protection Law and other acts (Official Journal, No 113, item 954).

According to Article 46 of the EPL Act, obtaining an *environmental decision* (development consent) is obligatory for proposed projects that may significantly impact the environment, if in order to carry out the project it is required to obtain a *decision granting a permit.* Obtaining such an environmental decision implies going through an EIA procedure. The environmental consent procedure differs depending on whether a particular project is included in:

- Projects that always require the EIA report (previously referred to as investments particularly harmful to environment and human health), hereinafter called **group I** projects.
- Projects that may require the EIA report (previously referred to as investments that may worsen the state of environment), hereinafter called **group II** projects.
- Projects that may significantly impact Natura 2000 sites and are neither included in group I nor in group II, hereinafter called **group III** projects.

Article 53 of the EPL Act introduces the requirement that the body responsible for carrying out the EIA procedure must ensure public participation in procedures requiring EIA report. Issues related to public participation are specified in Title I Part V of the EPL Act "Public participation in procedures relating to environmental protection"

The EIA procedure comprises the following four stages:

Initiating the procedure

The EIA procedure is initiated by submitting an application for issuing an environmental decision for carrying out a project that may impact the environment.

With relation to group I projects, for which the EIA report is always required, the EIA report should be submitted along with the application. Before submitting the application, the applicant has the right to request the body issuing a particular decision to specify the scope of the report. In such an event, the applicant should attach to the request, information on the proposed project specified in Article 49 (3) of the EPL Act.

With relation to group II and III projects, for which the requirement to prepare the EIA report must be stated by the body responsible for issuing a particular decision, basic information on the project must be attached to the application. The information required is specified in Article 49 (3) of the EPL Act.

Screening procedure with regard to preparing the EIA report

This stage is carried out solely for group II and III projects. The body responsible for issuing the decision decides whether it is necessary to prepare the EIA report. Prior to this, the body must consult other bodies responsible for environmental protection issues as well as sanitary inspection bodies. Moreover, it must consider information supplied by the applicant, data on local environmental and social conditions, and criteria relating to the characteristics of the project, emission-levels, location, type and extent of the impacts.

Specifying the scope of the EIA report

If the relevant body states that the EIA report is required it must also specify the scope of the report. Prior to this, it must consult other bodies responsible for environmental protection as well as sanitary inspection bodies. During the scoping procedure the body should also consider the type and location of the project as well as the extent of its impact on environment.

Before submitting the application to issue the decision, the applicant planning a project from group I is entitled to request the body responsible for issuing the decision to specify the scope of the EIA report.

Issuing the decision

Having obtained the EIA report, the body responsible for issuing a particular decision is obliged to check whether the report fulfils the requirements specified in the EPL Act and whether it constitutes the basis for issuing the decision.

The body issues the decision only after examining the EIA report, comments and recommendations submitted by representatives of society, as well as approvals granted by bodies responsible for environmental protection and sanitary inspection (the bodies are specified in the EPL Act).

In the event of lack of obligation to prepare the EIA report, the body issues the decision after considering information submitted along with the application (specified in Article 49 (3) of the EPL Act) and the opinions of the bodies granting the approvals.

The EIA procedure in Poland is then in accordance with the requirements and guidelines set in Directive 97/11/EC amending Directive 85/337/EEC.

Past concerns with the Polish approach to screening of Annex II projects and assessing the impacts on Natura 2000 sites, have been overcome with the recent modification of the Environmental Protection Law Act of 27 April, 2001 by the Act of 18 May, 2005.

A detailed description of the screening, public participation, and scoping processes in Poland is given in chapters 4, 5 and 6 of this EIA report.

4. PROJECT SCREENING

4.1 INTRODUCTION

The screening process is undertaken to focus on those projects with potentially significantly adverse environmental impacts or whose impacts are not fully known. This is so, because the number of projects that could be subject to EIA is potentially very large and yet many projects have no substantial or significant environmental impact,

Screening can be partly determined by the EIA regulations operating in the country where the project takes place at the time of the assessment. In the EU, including Poland, there are some projects, those included in Annex I of European Union Directive 85/337/EEC as amended by Directive 97/11/EC, that will always be screened out for full assessment, by virtue of their scale and potential environmental impacts. There are other projects, those in Annex II, for which the screening decision is not as straightforward. In such cases, it is important to have working guidelines, indicative criteria and thresholds on conditions considered likely to give rise to significant environmental impacts.

In this regards, Member States may choose to place projects in categories and setting thresholds for each project type related to project characteristics, anticipated project impacts or project location, or a case by case approach may be preferred, involving the appraisal of the characteristics of projects as they are submitted for screening, against a checklist of guidelines and criteria. Hybrid approaches may also be used.

This chapter describes the screening process carried out for EIA of the Gdansk Water and Wastewater Project, consisting of 28 subprojects.

The GIWK has requested the EBRD to participate in the co-financing of a number of these water and wastewater projects in the City. The GIWK is also applying for Cohesion funding for all of these projects.

As required by the Cohesion Fund guidelines, all application for the Fund's assistance must include documentation concerning assessment of the project's environmental impact according to the requirement of Directive 85/337/EEC as amended by Directive 97/11/EC. Cohesion Fund projects can only be approved by the European Union (EU) if they meet the EU EIA Directive requirements. In addition the EU requires that the impacts of the entire project are assessed and not just its individual elements.

On the other hand, EBRD Environmental Policy states that projects supported by the Bank must always meet the requirements under the applicable national legislation.

For these reasons an EIA is required that will encompass all the water and wastewater subprojects and fully comply with the EU EIA Directive as amended, as well as Polish environmental regulations.

In order to understand the screening process, first the screening guidelines recommended by the EBRD and the EU Commission are described, along with the screening procedures established by Polish regulations. The screening process to which the project has been subject is then addressed.

4.2 SCREENING GUIDELINES

4.2.1 Overview of the EBRD Environmental Policy on Screening

Screening is the first step in the EBRD's environmental appraisal process. It is carried out to identify potential environmental issues associated with a proposed project and to specify the types of environmental information required in order to assess environmental risks, liabilities, regulatory compliance, any adverse environmental impacts and other concerns. Screening is also used to identify potential environmental benefits or enhancements, which could be built into proposed projects.

The screening process results in the categorisation of projects. Direct investments are categorised under three categories, A, B or C, depending on the type, location, sensitivity and scale of the project seeking EBRD funding and the nature and magnitude of its potential environmental impacts, to determine the level of investigation required.

Projects are classified as Category A when the project receiving EBRD funding could result in potentially significant adverse future environmental impacts which, at the time of screening, cannot readily be identified or assessed. An Environmental Impact Assessment (EIA) is therefore required to identify and assess the future environmental impacts associated with the proposed project, identify potential environmental improvement opportunities, and recommend any measures needed to prevent, minimise and mitigate adverse impacts. Annex I of the Environmental Policy includes an indicative list of Category A projects.

Projects are classified as Category B when the project receiving EBRD funding could result in future environmental impacts which are less adverse than those of Category A projects, taking into account their nature, size and location, as well as the characteristics of the potential environmental impacts. Category B projects require an Environmental Analysis to assess any potential future environmental impacts associated with the proposed project, identify potential environmental improvement opportunities, and recommend any measures needed to prevent, minimise, and mitigate adverse information is available at the time of screening to determine the appropriate category.

Projects are classified as Category C when the project receiving EBRD funding is likely to result in minimal or no adverse future environmental impacts and therefore requires neither an EIA nor an Environmental Analysis.

In addition, projects supported by the Bank must always meet the requirements under the applicable national legislation.

4.2.2 Screening Guidelines Developed by the European Commision

EIA is a procedure required under the terms of European Union Directives 85/337/EEC and 97/11/EC on assessment of the effects of certain public and private projects on the environment.

Screening represents the first stage in the process required by the Directive, where it is determined whether an EIA is required for a particular project.

The requirements for screening are contained in Article 4 of Directive 97/11/EC. Article 4(1): "*…projects listed in Annex I shall be made subject to an assessment…*". EIA is therefore mandatory for the categories of projects listed in Annex I. The Annex I list defines 21 categories of projects for which EIA is mandatory. Screening of these projects must lead to a "yes" decision that EIA is required.

Article 4(2) requires that for "*…projects listed in Annex II, the Member States shall determine through*

(a) a case-by-case examination, or

(b) thresholds and criteria set by the Member State

whether the project shall be made subject to an assessment…"

The Annex II list defines 80 categories of projects for which EIA is required if significant effects on the environment are likely to occur.

For Annex II projects, Article 4(3) requires that "*When a case-by-case examination is carried out or thresholds or criteria are set….. the relevant selection criteria set out in Annex III shall be taken into accoun*t". These require to consider the sensitivity of project locations and potential impacts, as well as the characteristics of projects, in deciding whether EIA is needed.

Finally Article 4(4) requires that "*Member States shall ensure that the determination made by the competent authority…..is available to the publi*c." This is, screening decisions must therefore be made public.

A specific additional requirement for environmental assessment arises under Article 6(3) of the Habitats Directive (92/43/EEC). Member States must implement legislation requiring an assessment to be made of any project, which is likely to have significant effects on a Natura 2000 site (a Special Protection Area, SPA, designated under Directive 79/409/EEC or a Special Area of Conservation, SAC, designated under Directive 92/43/EEC). In many cases this assessment can be achieved through the EIA procedure implemented under Directives 85/337/EEC and 97/11/EEC, but in some cases, for example, where the project does not fall under either Annex I or Annex II, a separate procedure is needed. Special guidance on these requirements is available in the EU publication *Assessment of Plans*

and Projects Significantly Affecting Natura 2000 Sites. Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. November 2001.

4.2.2.1 General Guidance on Screening

A document to provide practical help to those involved in the screening process of the EIA has been published by the European Commission. This document is titled *Guidance on EIA. Screening. June 2001*. It outlines a five-step process in which the first three steps basically consist of determining whether:

1. the project is an Annex I or II project of Directive 97/11/EC or any equivalent Member State lists. If a project is not of a type listed in Annex I or II or any equivalent Member State lists, EIA is not required, unless a Habitats Directive assessment is required.
2. there is a mandatory requirement for EIA for the project under Member State legislation. Included here are also the procedures of donor agencies (e.g. the EBRD) funding the project.
3. the project is on an exclusion list exempting it from EIA.

If after step 3, the need for EIA has not been determined yet, step 4 is carried out using a Case-by-Case consideration, where the key question is: Is the project likely to have significant effects on the environment? In undertaking case-by-case screening, the factors listed in Annex III of the Directive must be considered, along with any Member State guidance. The European Commission has developed tools designed to help answer the key question.

When a formal screening decision is finally made, the last step is the recording of the screening decision and the reasons for it, making this record available to the public.

Case-by-Case Screening Tools

Thresholds and Criteria

Thresholds and criteria provide a clear cut method of defining whether or not a project requires EIA. A threshold or criterion can be:

- a specific defined quantitative characteristic of a project
- a specific defined qualitative characteristic of a project
- a combination of both quantitative and qualitative characteristics

Checklists

To help in the application of the criteria set in Annex III of the Directive for deciding whether or not a project is likely to have significant effects on the environment, the European Commission has developed two checklists:

- Screening Checklist. Provides a list of questions about the project and its environment, which users can use to help answer the question "Is this project likely to have a significant effect on the environment?"
- Checklist of Criteria for Evaluating the Significance of Environmental Effects. Designed to be used alongside the Screening Checklist. These questions can be asked for each "Yes" answer in the Screening Checklist and the conclusion and the reasons for it noted in the checklist. The questions are designed so that a "Yes" answer will generally point towards the need for EIA and a "No" answer to EIA not being required.

Interpreting the Results

The guide does not specify any particular rule that can be used to decide whether the results of using the Screening Checklist should lead to a positive or negative screening decision. In theory if there is one "Yes" answer to the question, is it likely to result in a significant effect, EIA may be required; however, as a general principle, the greater the number of "Yes" answers and the greater the significance of the effects identified, the more likely it is that EIA is required. "?" answers, indicating uncertainty about the occurrence or significance of effects, should also point towards a positive screening decision (i.e. that EIA is required) because the EIA process will help to clarify the uncertainty.

Information for Screening

In considering whether a project requires EIA, some information about the project will be required. Where a formal screening decision is made by the competent authority the developer may be required to provide information to the Authority. The details of the information, which can be requested will be set out in Member State legislation and guidance.

The guide provides a list of information that the developer may be asked to supply for screening purposes. Some or all of this information may be required to the developer. This information includes:

Contact Details of the Developer: name of the company, address, telephone, etc.

Characteristics of the Project: brief description of the proposed project; reasons for proposing the project; a plan showing the boundary of the development including any land required temporarily during construction; the physical form of the development; description of the main processes; any

new access arrangements or changes to existing road layout; a work programme for construction; operation and commissioning phases, and restoration and after-use where appropriate; construction methods; resources used in construction and operation; the relationship with other existing/planned projects; information about alternatives being considered, information about mitigating measures being considered; other activities which may be required as a consequence of the project; details of any other permits required for the project.

Location of the Project: maps and photographs showing the location of the project relative to surrounding physical, natural and man-made features; existing land-uses on and adjacent to the site and any future planned land uses; zoning or land-use policies; protected areas or features; sensitive areas; details of any alternative locations which have been considered.

Characteristics of the Potential Impact: brief description of the likely impacts of the project considering the following factors; nature of the impacts; extent of the impact; magnitude and complexity of the impact; probability of the impact; duration, frequency and reversibility of the impact; mitigation incorporated into the project design to reduce, avoid or offset significant adverse impacts, transfrontier nature of the impact.

4.2.2.2 Screening for Projects which may Affect Natura 2000 Sites

Where a project or plan may affect a Natura 2000 site, an Environmental Impact Assessment may be required as specified in Articles 6.3 and 4 of the Habitats Directive 92/43 EEC. For such cases, the European Commission has prepared a *Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites* (November 2001).

A flow chart showing the assessment process for Natura 2000 sites is shown at the end of this section.

As in any Environmental Impact Assessment process, there is a screening stage to determine if it can be objectively concluded that the effects of a proposed project upon a Natura 2000 site will or will not be significant, either alone or in combination with other projects.

The approach to decision-making in this screening stage recommended by the European Commission is to apply the precautionary principle proportional to the project and the site in question. The precautionary principle requires that the conservation objectives of Natura 2000 should prevail where there is uncertainty.

Thus, for very minor projects or plans, it may be possible for the competent authority to decide that there will be no significant effects on the basis of a description of the project alone. Similarly, that level of information may be sufficient to decide that there are likely to be significant effects for large

projects. Such decisions can be made on the basis of the competent authority's knowledge of the Natura 2000 site in question and the fact of its designation and conservation status. Where it is less obvious that there are or are not likely to be significant effects, a much more rigorous approach to screening is necessary.

The application of the precautionary principle and the need for transparency of decision-making require that the conclusion that there are unlikely to be significant environmental effects should be recorded and reported. For this reason, it is considered good practice to complete a finding of no significant effects report where it has been objectively concluded that there are unlikely to be significant environmental effects on the Natura 2000 site. Where, without any detailed assessment at the screening stage, it can be assumed (because of the size or scale of the project or the characteristics of the Natura 2000 site) that significant effects are likely, it will be sufficient to move directly to a full Environmental Impact Assessment rather than complete the screening assessments explained below.

Also, if the proposal is for a project to which the EIA directive applies, then the trigger of significance used to screen EIA projects is likely to also screen projects for their potential significant impacts on Natura 2000 sites.

The screening approach described in the European Commission guide comprises four steps:

1. Determining whether the project is directly connected with or necessary to the management of the site;
2. Describing the project and the description and characterisation of other projects that in combination have the potential for having significant effects on the Natura 2000 site;
3. Identifying the potential effects on the Natura 2000 site;
4. Assessing the significance of any effects on the Natura 2000 site.

These steps are briefly described below.

Step One: Management of the site

In this step, it is determined whether the project is directly connected to or necessary for the management of the Natura 2000 site. The "management" component must refer to management measures that are for conservation purposes, and the "directly" element refers to measures that are solely conceived for the conservation management of a site and not direct or indirect consequences of other activities.

Two: Description of the project or plan

This step consists of the identification of those elements of the project, alone or in combination with other projects, that have the potential for having significant effects on the Natura 2000 site. The guide includes a checklist (non comprehensive) of the main type of project parameters that will normally need to be identified.

Step Three: Characteristics of the site

The identification of impacts upon the Natura 2000 site will require a characterisation of the site as a whole or of the areas where impacts are most likely to fall. The guide suggests sources that will need to be consulted in order to identify key features of the Natura 2000 site.

There will be key aspects of the project that will have impacts upon key characteristics of the site. In order to ensure all impacts upon the site are identified, including those direct and indirect impacts that are a result of cumulative impacts, the guide suggests a methodology showing the steps for assessing whether or not the potential cumulative impacts are likely to be significant.

Step Four: Assessment of significance

The next step of the screening stage is the assessment of the significance of the impacts identified in previous steps (the concept of "significance" is discussed in Annex 1, Section 4 of the Guide).

The significance test may require little more than consultation with the relevant nature conservation agency. In other cases, particularly where there is a difference of opinion between stakeholders, it may be necessary to carry out further investigations to establish whether the effects on a project or plan are likely to be significant. A common means of determining the significance of effects is through the use of key indicators. The guide provides examples of indicators with suggestions as to how they can be used.

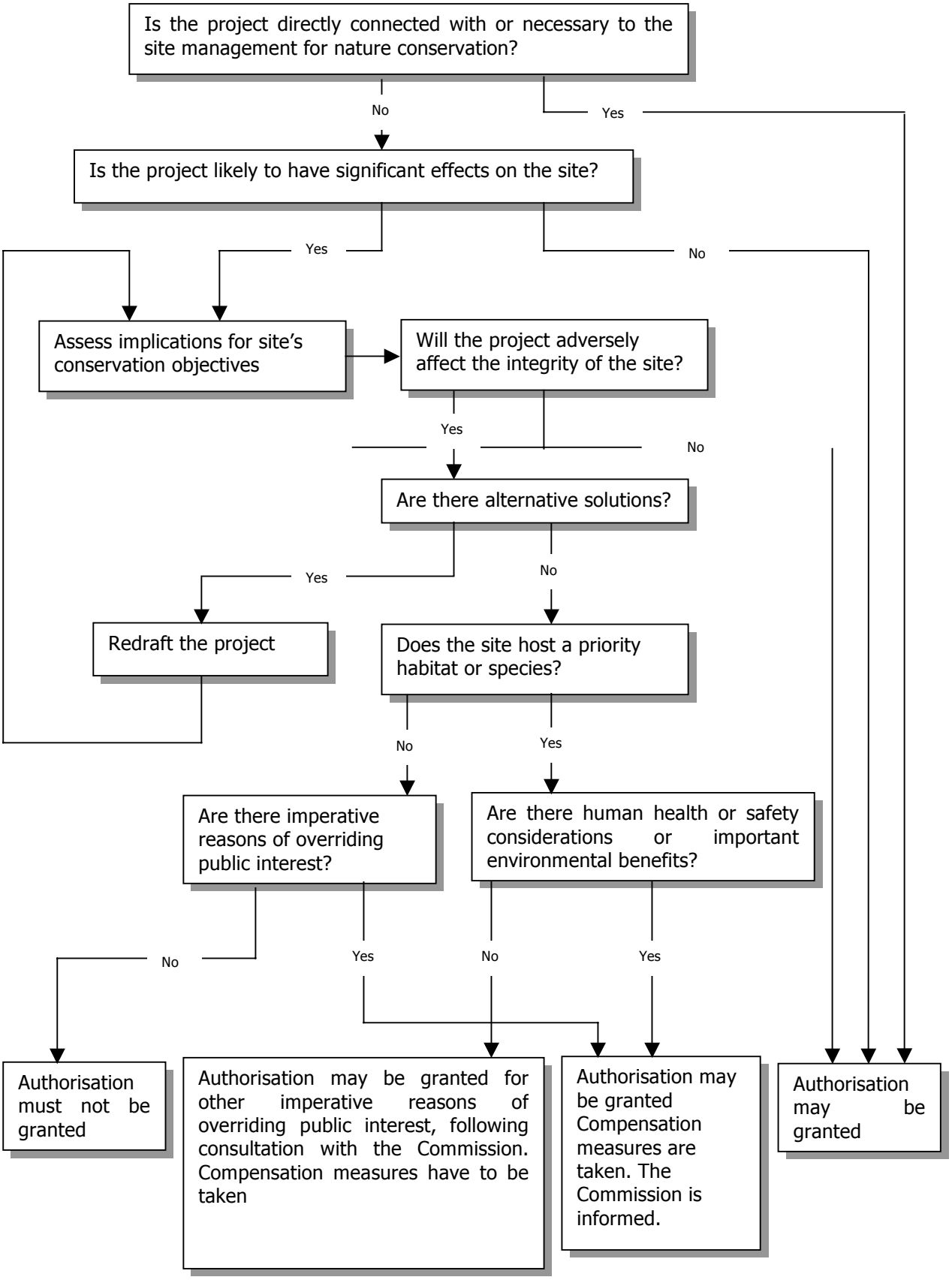
Where it has been decided to carry out further investigation, it will be important to make use of verifiable assessment techniques. In order that the test of significance of effects can be carried out in a systematic and objective manner, further checklists and matrices may be used. The guide provides a worked example of the screening matrix. Once the screening matrix has been completed, the decision could be in the form of one of two statements:

1. *it can be objectively concluded that there are not likely to be significant effects on the Natura 2000 site; or*
2. *the information provided either suggests that significant effects are likely or that sufficient uncertainty remains to indicate that an appropriate assessment should be carried out.*

Outcome of the Screening Stage

Following the screening assessment, and where it has been concluded that significant effects are likely, or that there is not sufficient certainty to conclude otherwise, the next stage of the assessment process described in the guide should be followed. If, however, it can be concluded at this stage that there are unlikely to be significant effects on the Natura 2000 site, it should be good practice to complete the finding of no significant effects report, which should be made available to relevant stakeholders.

Flow chart for determining affection or not to Natura 2000 sites (Article 6.3 and 4 of the Habitats Directive 92/43 EEC)



4.2.3 The Screening Process in Poland

The environmental assessment process in Poland is regulated by the Environmental Protection Law Act of 27 April, 2001 (Official Journal No.62, item 627 with amendments), and the Act of 18 May, 2005 on changes in The Environmental Protection Law and other acts (Official Journal, No 113, item 954).

According to Article 46 of the EPL Act, obtaining an *environmental decision* (development consent) is obligatory for proposed projects that may significantly impact the environment, if in order to carry out the project it is required to obtain a *decision granting a permit.* Obtaining such an environmental decision implies going through an EIA procedure.

A decision granting a permit can be(according to the Article 46 (4,5) of the EPL Act):

- Decision granting a consent for construction or demolition of a built structure and decision granting a consent for changing the use of a built structure or a part of it.
- Decision granting a consent for demolition of nucelar obects,
- Concession for exploration of, or prospecting for, mineral deposits, extraction of minerals from their deposits, open storage of substances in the rock mass and storage of waste in underground mine headings
- Water-law permit for execution of water facilities (as specified in Water Act)
- Decision which sets out the conditions for the execution of works consisting in water regulation and the construction of flood control dikes as well as land amelioration works, constructing site drainage and other earthworks which change the water regime - on sites with significant natural values, particularly on sites with concentrations of vegetation with significant natural values, sites with landscape and ecological values, the grounds of mass breeding of birds, those with concentrations of protected species and fish spawning grounds, wintering areas, fish passes and sites of mass migration of fish and other aquatic organisms.
- Decision granting authorization for a project of restructuring of rural land holdings.
- Decision on changing a forest into agricultural land.
- Decision granting authorization for the location of a motorway,.
- Decision granting location indications for a motorway.

The environmental consent procedure differs depending on whether a particular project is included in:

- Projects that always require the EIA report, hereinafter called **group I** projects.
- Projects that may require the EIA report, hereinafter called **group II** projects.

- Projects that may significantly impact Natura 2000 sites and are neither included in group I nor in group II, hereinafter called **group III** projects.

With relation to group II and III projects, the EPL Act provides for a special screening procedure where the requirement to prepare the EIA report must be stated by the body responsible for issuing a particular decision.

The EIA procedure is initiated by submitting an application for issuing an environmental decision for a project that may impact the environment.

For group I projects, the EIA report should be submitted along with the application.

For group II and III projects, basic information on the project must be attached to the application, as specified in Article 49 (3) of the EPL Act.

Screening is carried out for group II and III projects. The body issuing the decision is responsible for the screening stage.

The screening stage for a group II or III project requires issuing an interim decision on either the obligation of preparing the EIA report for the project or the waiver for not preparing it.

If the relevant body states that the EIA report is required, it must also specify the **scope** of the report.

For group I projects, the applicant has the right to request the body issuing a particular decision to specify the **scope** of the report. Such a request is to be done before submitting the application. Information on the proposed project must be attached to the request as specified in Article 49 (3) of the EPL Act.

Guidelines for the screening stage

Step 1: Verifying provided information

Aims at verifying whether information provided by the applicant is sufficient to issue the interim decision on the obligation to prepare the EIA report.

Step 2: Checking obligatory registers of projects and exemptions

It is a formal step and assumes checking whether a given project is included in group I, i.e. whether it is placed in the register included in the Council of Ministers Regulation on specifying the types of projects that may significantly impact the environment and detailed criteria for screening the project with relation to preparing environmental impact assessment report.

According to Article 51 (7) of the EPL Act, the EIA report is required for group II projects, if the implementation of the project depends on designation of a restricted use area. Such a provision is

necessary due to the possibility, introduced by the EPL Act, to designate a restricted use area at the stage of project's implementation, if the necessity to designate such an area results among other things from the EIA procedure (Article 135 (1) of the EPL Act). The obligation to prepare the EIA report with relation to the aforementioned situation regards only the following investments: sewage treatment facilities, municipal waste landfills, composting plants, transport routes, airports, power lines and stations, as well as radio-communication, radio-navigation or radiolocation installations. The restricted use area is designated for those projects, only if despite utilizing all available technical, technological and organizational solutions, environmental quality standards are not met at the area outside the plant or another site.

Projects requiring public participation according to the provisions of the Aarhus also require the EIA report as, according to the provisions of the EPL Act, public participation procedure is carried out only for those projects for which the EIA report is prepared.

Step 3: Checking the register of projects that may require the EIA report

The register of projects that may require the EIA report should be checked for group II projects. The register is included in the Council of Ministers Regulation on specifying the types of projects that may significantly impact the environment and on detailed criteria for screening the project with relation to preparing environmental impact report.

For group III it should be checked wether the project is located close or within Natura 2000 site.

The body responsible for issuing one of the decisions must decide individually for each project from the register whether the EIA report is required.

Step 4: Using supplementary registers in the screening process

If applying the detailed criteria specified in the Regulation is not sufficient to decide whether the EIA report should be prepared for a given project, the next step is to evaluate characteristic traits of the project, environmental conditions of the area surrounding it, types of probable impacts as well as other factors that may have influence on the decision regarding the obligation to prepare the EIA report. Supplementary Register No. 1 will help in identifying project's potential impacts. This register is very similar to the Screening Checklist and the Checklist of Criteria for Evaluating the Significance of Environmental Effects of the EC screening guideline.

4.3 SCREENING OF THE PROJECT

The Poland Gdansk Water and Wastewater comprises 28 sub projects, of which 17 are related to drinking water management issues, and 11 are related to wastewater issues. Among the drinking water management projects there are a number of projects that involve the abstraction of

groundwater and the construction of water pipelines, which are addressed in both annexes I and II of the European Union Directive 85/337/EEC as amended by Directive 97/11/EC. Likewise, among the wastewater projects, there are wastewater treatment plants and wastewater pipelines also addressed in these annexes of the Directive.

The City of Gdansk is applying for Cohesion funding for all of these projects. Concern has been raised regarding the Polish approach to screening of Annex II projects as well as assessing the impacts on Natura 2000 sites, including those listed on the so called 'shadow list' prepared by NGO's.

An assessment has been conducted to evaluate the screening process that Polish authorities have conducted on these projects. This assessment has involved checking that the process has followed EU screening criteria. For this, the following information has been reviewed:

- Application for Assistance for the Cohesion Fund 2000-2006. Annex I. Environmental Impact Assessment. The document provided includes the application as well as the attachments (Official Polish documents related to the process).
- Applications for environmental decisions regarding affection to Natura 2000 Network Areas.
- Responses from the Authority responsible for monitoring the Natura 2000 Network Areas.

4.3.1 Screening of Annex I Projects

		Directive 85/337/EEC, as amended by Directive 97/11/EC		
Task No	**Task**	**Annex I**	**Annex II**	**Not covered**
1.	Building of a measuring and monitoring for the Gdańsk Water System	-	-	**X**
2.	Building of Kiełpino water reservoir along with rebuilding of Migowo pumping station and building of water mains to connect Kiełpino water reservoir with the central Gdańsk water supply system.	-	**X** (AII-10j)	-
3.	Building of water treatment station Osowa complete with water reservoir Osowa	-	**X** (AII-10j)	-
4.	Building of water main connecting Gdańsk-Osowa with the central Gdańsk water supply system	-	**X** (AII-10j)	-
5.	Rebuilding of Lipce water intake and water treatment plant	**X** (AI-11)	-	-
6.	Building of water main supplying Orunia-Olszynka area from Lipce water	-	**X**	-

Task No	Task	Directive 85/337/EEC, as amended by Directive 97/11/EC		
		Annex I	Annex II	Not covered
	intake		(AII-10j)	
7.	Treatment of water from Pręgowo water intake (building a water treatment station in Pręgowo)	-	-	**X**
8.	Building of water main for Gdańsk-Południe district	-	**X** (AII-10j)	-
9.	Extension of water treatment station Zaspa Wodna	-	-	**X**
10.	Rebuilding of water intake and water treatment station Dolina Radości	-	**X** (AII-10l)	-
11.	Water supply to Kokoszki-Bysewo area (building of water supply network in the area of Kokoszki –Bysewo)	-	**X** (AII-10j)	-
12.	Building of water pipeline in Żuławy – area of Olszynka	-	**X** (AII-10j)	-
13.	Recommisioning of Stara Dolina water reservoir	-	-	**X**
14.	Building of water intake and water treatment plant Zakoniczyn	-	**X** (AII-10l)	-
15.	Reconstruction of water pumping station Ptasia	-	-	**X**
16.	Building of new pumping station in the area of Orunia reservoirs, plus building of two water reservoirs	-	**X** (AII-10j)	-
17.	Building a water supply network and new pumping station for lowland area – pumping station Sobieski	-	**X** (AII-10j)	-
18.	Extension of Wastewater Treatment Plant Gdańsk-Wschód-step III-connection of Wastewater Treatment Plant Zaspa discharge area	-	**X** (AII-10j)	-
19.	Sewage system for Osowa-Barniewice-Klukowo	-	**X** (AII-10j)	-
20.	Sewage and storm water system for Zabornia district	-	**X** (AII-10j)	-
21.	Sewage system for Jasień-Wieś	-	**X** (AII-10j)	-
22.	Sewage system for Łostowice district	-	**X** (AII-10j)	-
23.	Sewage system for Sobieszewska Island	-	**X** (AII-10j)	-

		Directive 85/337/EEC, as amended by Directive 97/11/EC		
Task No	**Task**	**Annex I**	**Annex II**	**Not covered**
	Island			
24.	Building a sewage system for Gdańsk – Orunia	-	**X** (AII-10j)	-
25.	Building a sewage system for Olszynka district	-	**X** (AII-10j)	-
26.	Building a sewage system for Kiełpino Górne district	-	**X** (AII-10j)	-
27.	Sewage systems for Święty Wojciech and Lipce districts and the areas adjacent to Trakt Św. Wojciecha Street	-	**X** (AII-10j)	-
28.	Extension of Wastewater Treatment Plant Gdańsk Wschód – step II b – sludge management, adjustment to stricter nitrogen removal requirements	**X** (AI-10)	**X** (AII-13/AI-13)	-

The classification shown in the Table is considered to be correct. The project category and the Annex where it belongs are indicated in the Table in an abbreviate form. The abbreviated project categories shown correspond to the following:

Projects related to the Poland Gdansk Water and Wastewater project that are in Annex I

(AI-10): 10 Waste disposal installations for the incineration or chemical treatment (as defined in Annex IIA of Directive 75/442/EEC under heading D9) of non-hazardous waste with a capacity exceeding 100 tonnes per day.

(AI-11): 11 Groundwater abstraction or artificial groundwater recharge schemes where the annual volume of water abstracted or recharged is equivalent to or exceeds 10 million cubic metres.

(AI-13): 13 Waste water treatment plants with a capacity exceeding 150.000 population equivalent as defined in Article 2 point (6) of Directive 91/271/EEC (5).

Projects related to the Poland Gdansk Water and Wastewater project that are in Annex II

(AII-10j): 10 Infrastructure projects, (j) Installations of long- distance aqueducts.

(AII-10l): 10 Infrastructure projects, (l) Groundwater abstraction and artificial groundwater recharge schemes not included in Annex I.

(AII-11c): 11 Other projects, (c) Waste-water treatment plants (projects not included in Annex I).

(AII-11d): 11 Other projects, (d) Sludge-deposition sites.

(AII-13): 13 Any change or extension of projects listed in Annex I or Annex II, already authorised, executed or in the process of being executed, which may have significant adverse effects on the environment.

The two subprojects classified in Annex I are:

Subproject 05. Rebuilding of Lipce water intake and water treatment plant. This project involves an average water abstraction of 12.775.000 m^3/year.

Subproject 28. Extension of Wastewater Treatment Plant Gdańsk Wschód – step II b – sludge management, adjustment to stricter nitrogen removal requirements.

Subproject 05 involves the modernization of the existing underground water intake located in Gdansk-Lipce, Niegow and areas of commune Pruszcz Gdansk. This involves the liquidation of one Cretaceous well and reconstruction (or perforation of a new borehole) of one Cretaceous well; replacement of well casings, hydrants, submersible pumps, hydrants, gate vents and valves. This water intake was designed in 1970 for 1.800 m^3/hour (15,768 million m^3/year), and authorized, according to the water permit issued in 2003, to pump 20.000 m^3/day (7,3 million m^3/year). The current working capacity is 1.100 m^3/hour (9,636 million m^3/year), this is less than 10 million cubic meters per year. However, with the modernization of the water intake, the intake capacity is planned to be increased to 35.000 m^3/day (14,583 million m^3/year), this is over 10 million m^3/year.

Subproject 28 consists of the extension of a wastewater treatment plants with a capacity exceeding 150.000 population equivalent, and thus it would be classified under Annex I. It also involves the production of dried sludge in a granulated form at the treatment plant. This final product will be stabilized chemically and biologically. The projected production of dried sludge is of 37 tons/day 90% dry substance content, for 2008, and 48 tons/day 90% dry substance content, for 2030. This represents 370 tons/day and 480 tons/day, respectively as wet sludge. These capacities exceed the 100 tonnes per day threshold set in Annex I and, thus, the project should be included in this Annex.

If the environmental assessment of impacts is to be considered for the project as a whole, even if it is comprised of several subprojects, which under Polish regulations are screened and assessed separately, it suffices to have only one subproject or one project activity, which needs Environmental Impact Assessment under the EU screening process, for having the entire project being subject to the assessment. Since subprojects 05 and 28 are included in Annex I, there should be no need for further screening as far as the necessity for an Environmental Impact Assessment to be prepared for the entire project in order to apply for funding of the Cohesion Fund.

4.3.2 Screening of Annex II Projects

Under Polish regulations, the EIA procedure under the Cohesion Fund is part of the application process for investment decisions. There are two levels of investment decisions:

First step: the investor (developer) makes the application for decision on conditions for development and use. However, if the investment (project) is located in an area covered by a local land use development plan, there is no need to apply in this first step.

Second step (final): the investor makes application for decision granting a consent for construction (building permit).

As explained previously, the Environmental Protection Law Act of 27 April, 2001 has recently been modified by the Act of 18 May, 2005. Since the permitting process for the individual subprojects started in 2003, most of them were screened according to the specifications set in the 2001 Law. According to the article 10 of the 2005 amendment to the Environmental Protection Act, for those subprojects that can affect Natura 2000 sites, it was an obligation to receive environmental decision for Natura 2000 sites within 6 mounths period.

The following Table shows the decisions issued for the subprojects under the 2001 EPL Act and the results of the associated screening process. It is also indicates whether they need to apply for additional environmental decision on the environmental conditions so as to obtain consent for the project execution and whether an application was submitted.

No	Task	Decisions issued under 2001 EPL Act	Need for additional environmental decision/Application has been submitted
1.	Building of a measuring and monitoring for the Gdańsk Water System	Out of Annexes I and II.	NO / NO
2.	Building of Kiełpino water reservoir along with rebuilding of Migowo pumping station and building of water mains to connect Kiełpino water reservoir with the central Gdańsk water supply system.	An investment decision on location of a public project was given to this project on 06/11/2003. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
3.	Building of water treatment station Osowa complete with water reservoir Osowa	An investment decision on conditions of land and building development was given to this project on 10/03/2004. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
4.	Building of water main connecting Gdańsk-Osowa with the central Gdańsk water supply system	An investment decision on location of a public project was given to this project on 07/11/2003. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES

No	Task	Decisions issued under 2001 EPL Act	Need for additional environmental decision/Application has been submitted
5.	Rebuilding of Lipce water intake and water treatment plant	An investment decision on location of a public project was given to this project on 03/08/2004. An **EIA** was obligatory . An **EIA** was **prepared**.	YES / YES
6.	Building of water main supplying Orunia-Olszynka area from Lipce water intake	An investment decision for building consent was given to this project on 25/08/2004. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
7.	Treatment of water from Pręgowo water intake (building a water treatment station in Pręgowo)	Out of Annexes I and II.	NO / YES
8.	Building of water main for Gdańsk-Południe district	An investment decision on conditions of land and building development was given to this project on 20/05/2003. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
9.	Extension of water treatment station Zaspa Wodna	Out of Annexes I and II.	NO / YES
10.	Rebuilding of water intake and water treatment station Dolina Radości	An investment decision on location of a public project was given to this project on 21/10/2004. An **EIA** was **required** by the competent authority (City of Gdansk). An **EIA** was **prepared**.	YES / YES
11.	Water supply to Kokoszki-Bysewo area (building of water supply network in the area of Kokoszki – Bysewo)	An investment decision on location of a public project was given to this project on 31/12/2004. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
12.	Building of water pipeline in Żuławy – area of Olszynka	An investment decision for building consent was given to this project for phase III-V on 25/08/2004 and an investment decision on location for phase VI on 10/05/2004 . **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
13.	Recommisioning of Stara Dolina water reservoir	Out of Annexes I and II.	NO / NO
14.	Building of water intake and water treatment plant Zakoniczyn	An application to the local land use development plan was submitted on 20/12/2004. The expected date of the plan approval is 31/12/2005.	YES / YES
15.	Reconstruction of water pumping station Ptasia	Out of Annexes I and II.	NO / NO
16.	Building of new pumping station in the area of Orunia reservoirs, plus building of two water reservoirs	An investment decision on location of a public project was given to this project on 06/07/2005. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES

No	Task	Decisions issued under 2001 EPL Act	Need for additional environmental decision / Application has been submitted
17.	Building a water supply network and new pumping station for lowland area – pumping station Sobieski	An investment decision on location of a public project was given to this project on 11/07/2005. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
18.	Extension of Wastewater Treatment Plant Gdańsk-Wschód-step III-connection of Wastewater Treatment Plant Zaspa discharge area	An investment decision for building consent was given for each of the three sub tasks of this project: on 03/02/2005 for sub task 3; on 26/07/2005 for sub task 1 and 11/10/2005 for sub task 2. An **EIA** was **required** by the competent authority (City of Gdansk and Pomorski Voivod).	YES / YES
19.	Sewage system for Osowa-Barniewice-Klukowo	An investment decision for building consent was given for each of the six sub tasks of this project on 27/12/2004, 20/06/2005, 04/07/2005, 20/06/2005 and 08/08/2005. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
20.	Sewage and storm water system for Zabornia district	No need for investment decision on conditions for development and use due to current local land use development plan (Act of Gdansk City Council No.XI/350/99 of 24 June 1999).	YES / YES
21.	Sewage system for Jasień-Wieś	No need for investment decision on conditions for development and use due to current local land use development plan (Act of Gdansk City Council No. LXII/882/98 of 17 June 1998).	YES / YES
22.	Sewage system for Łostowice district	An investment decision on location of a public project was given to this project on 26/07/2005. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
23.	Sewage system for Sobieszewska Island	No need for investment decision on conditions for development and use due to current local land use development plan (Act of Gdansk City Council No. XV/483/99 of 28 October 1999).	YES / YES
24.	Building a sewage system for Gdańsk – Orunia	An investment decision on location of a public project was given to this project on 07/05/2004. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
25.	Building a sewage system for Olszynka district	An investment decision for building consent was given for stage III-V on 25/08/2004, and an investment decision on location of a public project was given for stage VI on 10/05/2004. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES

No	Task	Decisions issued under 2001 EPL Act	Need for additional environmental decision/Application has been submitted
26.	Building a sewage system for Kiełpino Górne district	An investment decision on location of a public project was given to each of the two subtasks of this project on 10/05/2004 and 29/12/2004. An **EIA** was **required** by the competent authority (City of Gdansk) only for sub task V. An **EIA** was **prepared**.	YES / YES
27.	Sewage systems for Święty Wojciech and Lipce districts and the areas adjacent to Trakt Św. Wojciecha Street	An investment decision on location of a public project was given to each of the five subtasks of this project: on 10/05/2004 for subtask I and 27/10/2004 for subtasks II-V. **No need for EIA** was decided by the competent authority (City of Gdansk).	YES / YES
28.	Extension of Wastewater Treatment Plant Gdańsk Wschód – step II b – sludge management, adjustment to stricter nitrogen removal requirements	An investment decision on location of a public project was given to this project on 03/08/2005. An **EIA** was **required** by the competent authority (City of Gdansk). An **EIA** was **prepared.**	YES / YES

Note: For water treatment station Zakoniczyn (task 14) first the project of local land use development plan was applied. During this procedure (until plan will be approved), according to Polish law, it is not possible to get environemntal deciosion as well as building permit before the plan is accepted. As of today, it has not been approved yet.

Screening results under the 2001 EPL Act procedure

An EIA study has been prepared for subprojects 05 and 28, which are in Annex I of the Directive.

The screening process for those projects in Annex II has resulted in the need to prepare EIA studies for subprojects:

10. Rebuilding of water intake and water treatment station Dolina Radości.

18. Extension of Wastewater Treatment Plant Gdańsk-Wschód-step III-connection of Wastewater Treatment Plant Zaspa discharge area.

26. Building a sewage system for Kiełpino Górne district.

Decisions on location of public projects have been issued for sub projects 10 and 26, and building consents for the sub tasks of sub project 18.

These documents and associated documents have been reviewed for these projects.

The review of these documents indicate that the EIA study for sub project 10 was requested because the project is located within Tri-city Landscape Park and close to the designed nature conservation reservoir "Meadows in Dolina Radosci". The documents do not provide very extensive information on the exact criteria used to screen the project, but the location of the project in a protected area and

the closeness to a landscape of cultural and archaeological significance, included in Annex III of the Directive, seem to be screening factors that would have determined the need for the EIA study.

The review of the screening procedure for task 18 revealed that the reasons for the need to prepare an EIA study were, in the first place, the size of the project – it consists of three sub-tasks, including WWTP liquidation and connection with modern WWTP "Gdansk-Wschod". Moreover, to connect both WWTPs, "Zaspa" with "Gdansk-Wschod", it is necessary to provide works within the city center and in areas with high groundwater level. It seems that size of the project, as well as densely populated areas and wetlands, were screening factors that would have determined the need for the EIA study.

In the case of task 26, the reason for the EIA study was clearly stated in the decision to carry out an environmental impact assessment study: "…building of sewage system for district Kiełpino Górne will improve sanitary conditions in the district, but regarding topographic features, methods for preventing earth sliding should be analyzed".

Subprojects 14, 20, 21, and 23 were screened out because they are located in an area covered or to be covered by a local land use development plan. This implies that projects to be implemented in these areas need to meet specific requirements set in the local land use development plan.

For the rest of the projects, no significant environmental features have been associated to them and, therefore, have not been considered to need an EIA.

Screening results under the 2005 amended EPL act procedure

Applications for environmental decision concerning the affection on Natura 2000 sites have been submitted for all of the subprojects that are likely to have a significal impact.

The amended EPL also provides EIA procedure (applications for environmental decision have been submitted to the competent authority) for those tasks that are compatible with the agreements of land use development plans. This concerns for tasks 14, 20, 21, 23 and 19 (subtasks VII-VIII).

In August 2005, GIWK prepared applications for all twenty eight projects.

Each application submitted contained the following information:

Sponsor identification and contact information

A general description of the entire Gdansk Water and Wastewater Project, including its objectives and reasons for proposing it.

Detailed information of the subproject for which the application is being submitted, including:

1. Type, scale, location of the project and description of the individual elements of the project.
2. Land use and surface occupied by the project.

3. Description of the technology to be used in the construction of the elements of the project.
4. Alternatives studied.
5. Amount of water, raw materials, materials, fuel, power, etc. to be used during construction and operation
6. Environmental mitigation measures to be implemented.
7. Types and amounts of the emissions to the environment.
8. A consideration of potential transboundary effects.
9. Identification and description of nearest Natura 2000 sites, indicating the distance to them and the potential affections.
10. Identification of other sensitive and protected areas that might be affected.

This information was reviewed for each of the applications and it is considered in compliance with the information requirements set in Polish regulations as well as in European guidelines and Polish procedures.

All the applications have been assessed by the authority in charge of the procedure leading to the decision concerning the environmental prerequisites of the project approval, the Vovoid of Pomerania and Powiat Sanitary Inspektor. For each of the projects it has been considered that the project is not expected to exert any potential impact on Nature 2000 areas, considering the anticipated environmental impact of the planned project tasks at both their implementation and operation stages, and recognizing the fact that the sites are substantially distant from the closest Nature 2000 sites (see Table below). Except for subprojects 01, 13 and 15, in taking this decision, the authority in charge took into account the opinion to that effect expressed by the Provincial Nature Conservator in letter No. SR/S.VII.JJ.66335/46/2005, dated 22 September 2005. For subprojects 01, 13, and 15, the investment was found not to carry any potential significant impact on Natura 2000 areas because of substantial distance between the project sites and the Nature 2000 areas, and because of the nature of the investments, which correspond to minor projects.

		DISTANCE TO NATURA 2000 SITE (km)				
		Zatoka Pucka	Twierdza Wisłoujście	Ujście Wisły	Dolina Dolnej Wisły	Zatoka Pucka i Półwysep Helski
No	**NAME OF TASK**	PLB220005	PLH220030	PLB220004	PLB040003	PLH220032
01	Building of a measuring and monitoring for the Gdańsk Water System.	5	3	10	15	-
02	Building of the "Kielpino" water reservoir and reconstruction of the pumping station Migowo, building a new pipe connecting Kiełpino reservoir with Gdansk Water Supply System (GSW).	11	12	17	26	28
03	Building of water treatment station Osowa complete with water reservoir Osowa.	7,5	15	22	22	18
04	Building of water main connecting Gdansk Osowa with the central Gdansk water supply system	8	11	18	28	20
05	Reconstruction of water intake and water treatment plant Lipce.	12	9	11	18	31
06	Building of water main supplying Orunia - Olszynka area from Lipce water intake.	6	6	8	17	28
08	Building of water main for Gdansk South.	10	12,5	19	29	28
09	Extension of water treatment plant Zaspa Wodna.	1,8	4	15	24	19
10	Reconstruction of water intake and water treatment plant Dolina Radości.	6,5	10,5	18	28	-
11	Water supply for Kokoszki – Bysewo.	7,5	13,5	20	32	19
12	Building of water pipeline in Żuławy - area of Olszynka. Stages III, IV, V.	6	6	8	17	28
	Building of water pipeline in Żuławy - area of Olszynka. Stage VI.	6	7	8,5	17	22
13	Recommisioning of Stara Dolina water reservoir	5	3	10	15	-
14	Building of water intake and water treatment plant Zakoniczyn.	10	9	13	21	25
15	Reconstruction of water pumping station Ptasia	5	3	10	15	-
16	Building of new pumping station in the region of Oruńskie reservoirs and two reservoirs.	11	10	13	21	28
17	Building of network and new pumping station for lower located areas - pumping station Sobieski.	6	5,5	11	21	28
18	Extension of wastewater treatment plant Gdansk – Wschod – connection of Zaspa WWTP basin.	2	3,5	8	18	20

		DISTANCE TO NATURA 2000 SITE (km)				
		Zatoka Pucka	Twierdza Wisłoujście	Ujście Wisły	Dolina Dolnej Wisły	Zatoka Pucka i Półwysep Helski
No	**NAME OF TASK**	PLB220005	PLH220030	PLB220004	PLB040003	PLH220032
19	Sewage system Osowa – Barniewice – Klukowo. Stage I.	8	13	22,5	30	18
	Sewage system Osowa – Barniewice – Klukowo. Stages II to VI.	7,5	12	19	29	22
	Sewage system Osowa – Barniewice – Klukowo. Stages VII to VIII.	9	14	22	33	18
20	Sewage and storm water system for Zabornia.	9	9	13	24	27
21	Sewage system for Jasien Wies.	9	9	14	24	28
22	Sewage system for Łostowice district.	12	10	12	22	30
23	Sewage system for Sobieszewska Island.	8	17	< 1	< 1	30
24	Building of sewage system for Gdansk – Orunia.	6,5	6,5	9	18	28
25	Building of sewage system for Gdansk Olszynka. Stages II – V.	6	6	8	17	28
	Building of sewage system for Gdansk Olszynka. Stage VI.	6	7	8,5	17	22
26	Building of sewage system for district Kiełpino Górne.	11	12	18	27	32
27	Sewage system for districts Święty Wojciech , Lipce and surrounding areas. Stage I.	11	9,5	12	19	28
	Sewage system for districts Święty Wojciech , Lipce and surrounding areas. Stage II- V.	12	11,5	12,5	19	32
28	Extension of WWTP Gdansk Wschod – stage II b – sludge management, more strict nitrogen removal requirements	3,5	8	2,5	11	28

		DISTANCE TO NATURA 2000 SITE (km)				
		Dolina Reknicy	Jar Rzeki Raduni	Hopowo	Przywidz	Dolina Kłodawy
No	**NAME OF TASK**	PLH22008	PLH220011	PLH220010	PLH220025	PLH220007
07	Water treatment from Pregowo water intake.	4	13	13	11	10

Despite the favorable decisions issued by the Vovoid of Pomerania, the Powiat Sanitary Inspektor, and the Provincial Nature Conservator, the European Commission has requested a duty of confirmation of EIA procedure for tasks 7 and 9.

As explained in section 7.4. task 7 involves the construction of a new treatment station to treat the water, which is abstracted from the Pregowo intake. Currently, this water is distributed without removing the excess iron and manganese concentrations. The production capacity of the Pregowo water intake is 390 m^3/h (3.369.600 m^3/year) and, according to GIWK, there are no plans to perform modifications on this water intake. Unless, the European Commission would consider the treatment plant as an extension of the water intake, it is not considered that this project could be classified under Annex II project category AII-13: 13 Any change or extension of projects listed in Annex I or Annex II, already authorised, executed or in the process of being executed, which may have significant adverse effects on the environment.

Task 9 involves the extension of the existing water treatment station located at the Wrzeszcz quarter, at the Zaspa-Rozstaje housing estate in Gdańsk. The existing plant treats the water currently abstracted from twelve wells drilled in the Quaternary aquifer and three wells drilled in the Cretaceous aquifer, totalling a production capactity of 400 m^3/h (3.456.000 m^3/year). Again, according to GIWK, there are no plans to perform modifications on this water intake, and, therefore, it is not considered that this project could be classified under Annex II project category AII-13.

Nonetheless, GIWK has reapplied for environmental decisions on these projects, arguing the necessity of constructing the associated water and refuse water pipelines as the basis for a reapplication under Annex II project category AII-10j.

5. PUBLIC CONSULTATION AND DISCLOSURE PLAN

5.1 INTRODUCTION

The GIWK has requested the European Bank for Reconstruction and Development (EBRD) to participate in the co-financing of a number of water and wastewater projects in the City. The project itself consist of 28 sub projects, with the main objective being the elimination of existing gaps in water supply and wastewater systems.

The project will result in the development of a new large collector running through the city, as well as closure of an existing WWTP and water abstraction station.

The GIWK is applying for Cohesion funding for all of these projects. As required by the Cohesion Fund guidelines, all application or the Fund's assistance must include documentation concerning assessment of the project's environmental impact according to the requirement of Directive 85/337/EEC as amended by Directive 97/11/EC on assessment of the effects of certain public and private projects on the environment. The EIA procedure addressed under the terms of EU Directives includes the need for stakeholder involvement in the EIA process.

Thus, because the EBRD believes that meaningful public consultation is a way of improving the quality of projects it finances, and its policy states that projects are structured so as to meet applicable national environmental law, and EU environmental standards, a Public Consultation and Disclosure Plan (PCDP) has been prepared for the Gdansk Water and Wastewater Project.

5.2 PURPOSE OF THE PUBLIC CONSULTATION AND DISCLOSURE PLAN

Communications with stakeholders is an important part of the way that the sponsor conducts its business, and communication with the project stakeholders is an essential component of any environmental assessment process. In this process, the sponsor should be committed to active and ongoing communication with all organizations and individuals with an interest in the proposed project. The EBRD specifically pays particular attention to informing the public on the Project and to involving the public in the EIA process.

The PCDP seeks to define a technically and culturally appropriate approach to consultation and disclosure. The goals are to ensure that adequately and timely information is provided to project-affected people and other stakeholders, that these groups are given sufficient opportunity to voice their opinions and concerns, and that these concerns influence project decisions.

This PCDP first analyses international and national regulations and requirements on public participation so as to establish the criteria on how communication will work throughout the EIA process. It will define the roles and responsibilities of those involved in the public consultation and

disclosure process, the identification of stakeholders, the information disclosed, the means and timing of information disclosure, and the review and analysis of the consultation results.

5.3 INTERNATIONAL AND NATIONAL REGULATION REQUIREMENTS

International and national regulations and requirements that will be reviewed to prepare this PCDP are:

- European Bank for Reconstruction and Development (EBRD)
- European Commission
- Aarhus Convention
- Polish regulation

These requirements are briefly described in the following sections.

5.3.1 European Bank for Reconstruction and Development (EBRD)

The EBRD's principles of public consultation are documented in the Bank's Environmental Policy, Environmental Procedure, and the Public Information Policy. The EBRD fosters the principles of public consultation within its region of operation, and is guided by the underlying presumption that, whenever possible, information concerning the Bank's operational activities will be made available to the public in the absence of a compelling reason for confidentiality.

The EBRD standards require that projects, which have been classified as Category A and thus require an Environmental Impact Assessment, are held to the more stringent of national standards and European Union standards. In the area of public consultation, EBRD requires the European Union requirements in the EIA Directive, as amended, and concurs with the principles of the Aarhus Convention.

According to EBRD policy, public consultation and information disclosure is the responsibility of the project sponsor, and will be reviewed by the Bank, in line with its Policy commitments.

At a minimum, sponsors must ensure that national requirements and the EBRD requirements for public consultation are met.

EBRD guidelines for conducting public consultation include:

Notification

For "A" level projects, if there has been no previous notification, the project sponsor will need to provide the potentially affected public and interested non-governmental organisations (NGOs). The way that notification is undertaken will depend on local political, legal and cultural practice.

Scoping

By means of a scoping process, the project sponsor must ensure identification of all key issues, in particular, by consulting the affected public on the project and taking their comments into account. This scoping process will involve contact by the project sponsor with representatives of the affected public, government agencies, local authorities and other organisations.

As part of the scoping process, the project sponsor is required to prepare a draft Public Consultation and Disclosure Plan (draft PCDP) describing the public who may be affected by the project, how communication will work throughout the Environmental Impact Assessment process, and what information will be disclosed in relevant languages and by what means (e.g., Web site, libraries, etc.). The public should be able to provide comments and recommendations on the PCDP as well as the other scoping documents.

EIA disclosure

Project sponsors must make the EIA publicly available for comment in strategic locations, including at or near the project site, and where relevant, in the capital or other major cities. EIA documents, including the executive summary, must be made available in a language which is accessible to the majority of people affected by the proposed project. There may also be other tools used during disclosure, such as fact sheets on issues, prepared to increase understanding of issues in the EIA.

Timing of disclosure

For private sector projects there will be a minimum of 60 days between the date that the EIA is made available to the EBRD Board of Directors and the date of Board consideration. For public sector projects this period will be a minimum of 120 days. In practice, a longer disclosure period may be required by the Bank for more complex projects.

Public comments on EIAs

Following the completion of the public comment period, the project sponsor will need to provide information to those commenting and the affected public on how comments were taken into account.

5.3.2 European Commission

The EIA procedure addressed under the terms of Directive 97/11/EC amending Directive 85/337/EEC requires that the Member States ensure that:

Environmental information is made available to the authorities with environmental responsibilities and to other interested organisations and the general public for review.

These parties must be given an opportunity to comment on the project and its environmental effects before a decision is made on development consent. The detailed arrangements for such information

and consultation are elaborated in the EIA systems introduced in each Member State. (Article 6).

Environmental information and the results of consultations must be considered by the competent authorities in reaching its decision on the application for development consent (Article 8); and

The decision must be made available to the public including the reasons for it and a description of the measures that will be required to mitigate adverse environmental effects (Article 9

5.3.3 Aarhus Convention

The objective of the Aarhus Convention is to guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters, in order to protect people's rights to a healthy environment.

The Convention obliges public authorities to make sure that environmental information is available to the public upon request without discrimination and without having to state an interest. Although provisions are made for limitation of access to certain types of environmental information, this limitation is not strict and should take into account the public interest served by the disclosure.

The Convention entitles the public to participate in environmental decision-making concerning a wide range of economic activities, not only those covered by EIA procedures.

Public authorities ensure that the public is involved at as early stage of the project planning as possible when various project options are open for discussion. Any activities that may lead to environmental deterioration shall be subject to consideration in public and to teh public's consent.

Under the Convention the government ensures that anyone who considers that her or his request for information has been inadequately dealt with has access to court for a review procedure.

The Aarhus Convention is addressed in Directive 2003/35/EC of 26 May, providing for public participation in respect of the drawing up of certain plans and programmes relating to environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC.

5.3.4 Polish Regulation on Public Participation

Public participation in the Polish EIA procedure is specifically regulated in the Environmental Protection Law (EPL) Act of 27 April of 2001. Article 53 of the EPL Act specifies that the body responsible for issuing the decision must ensure public participation in EIA procedures requiring EIA reports. Title I, Part V of the EPL Act "Public participation in procedures relating to environmental protection" (Articles 31 to 39) regulates issues related to public participation.

Moreover, since the Aarhus Convention was ratified and included in the Journal of Laws of the Republic of Poland, it has become, according to Article 91 of the Constitution of the Republic of

Poland, a part of the Polish law. Therefore, the relevant provisions of the Aarhus Convention are also applied.

According to the Act, apart from parties in the procedure (e.g. applicants, owners of neighbouring real estates) and environmental organizations, which after stating their wish to participate in the procedure may do so with the rights of a party (Article 33 of the EPL Act), all the members of the society may actively participate in the procedure. However, their entitlements are less extensive than that of parties to the procedure or subjects participating with the rights of a party (e.g. they do not have the right to appeal or to file a complaint against the decision to the Chief Administrative Court).

The EPL Act does not change rights of a party in administrative procedure; it alters however, procedural rights of social organizations. The provisions of the Code of Administrative Procedure Act of 14 July 1960 (unified text, Dz.U. 2000 No.98 item 1071), hereinafter referred to as CAP, relating to comments and recommendations are not applied to comments and recommendations submitted under the provisions of the EPL Act. The change has been introduced mainly in order to remove the obligation provided for in the CAP to answer each comment and recommendation individually. The Act provides instead for the possibility of a collective response to all the comments and recommendations submitted during a given procedure.

Public participation procedure, which is a part of the EIA procedure, is conducted only in those cases that require the EIA report. Initiating public participation procedure and making information on the procedure public, **take place only after obtaining the report**.

In a "preliminary procedure", where, prior to initiating the procedure for issuing the decision for a group I project, the applicant may ask the relevant body to issue an interim decision on the scope of the EIA report (Article 49 (1) of the EPL Act), data on this interim decision should be placed in publicly accessible records. However, the body is not obliged to notify the public about it, as the EIA procedure is initiated only when the application with the EIA report is submitted.

Likewise, for group II and III projects, if the report is not required, the public is not notified about conducting the procedure, but the information on issuing the decision on the lack of obligation to prepare the report should be placed in publicly accessible records.

Thus, once the EIA report is submitted, the public participation procedure starts and consists of the following stages:

- The body informs (notifies the public) that information on initiating the procedure has been placed in publicly accessible record and that there is a possibility to access the documents and to submit comments and recommendations;
- Interested parties become familiar with the documentation;

- Interested parties submit comments and recommendations;
- The body considers the comments and recommendations submitted;
- The body may conduct an administrative trial.
- The body informs (notifies the public) that it has reached the decision and that interested parties have access to the decision and to information on comments and recommendations submitted and on the manner in which they were considered;

Issuing the decision finalises public participation procedure. Therefore, public participation procedure finishes at the same time as the procedure for issuing a particular decision.

Placing the data on the application in publicly accessible records

The preliminary stage of public participation procedure is to place the data on the application in publicly accessible records. In order to do it, the body has to fill in the information sheet. The form for such a sheet is specified in Annex to the Regulation of the Minister of Environment of 20 February 2001 on the form of publicly accessible records of data on documents including information on the environment and its protection (Dz.U. No. 15 item 164).

If the applicant submits the EIA report, the body should fill in Form E, an information sheet on the EIA report, which can be found in Annex to the Regulation of the Minister of Environment of 20 February 2001.

Notification of the public

Notifying the public is one of the most significant elements of the public participation procedure.

In the public participation procedure the body is obliged to notify the public about (Article 32 of the EPL Act):

- Placing in publicly accessible records, data on the application to issue the decision and on the EIA report attached to the application, if the report is required (therefore, for group I projects);
- Placing in publicly accessible records, data on the EIA report, if it is not required to submit the report along with the application (therefore, for group II and III projects).
- The possibility, place, and starting date and deadline date, for submitting comments and recommendations;
- Conducting administrative trial open to the public;
- Placing in publicly accessible records data on the decision.

Manners of notifying the public

According to Article 3 (19) of the EPL Act, the body may notify the public in the following ways:

- Provision in a customary manner at the seat of the body responsible for the procedure;
- Bill-posting in the vicinity of the proposed project;

Moreover, if the seat of the body responsible for the procedure is located in a municipality other than the municipality that is relevant in terms of location given the subject of notification, the public may be notified by:

- Publication in the local press, or
- In a customary manner, in locality or localities which are relevant given the subject of the notification.

The EPL Act introduces an additional requirement of placing the information on the web site of the body issuing the decision, if the body has such a web site.

For projects that are implemented in large areas, information should be placed not only in the offices of municipalities where the project is implemented but also in other places that are frequently visited by people (e.g. schools, post offices, markets, roads, shops, churches). The body conducting the procedure is responsible for informing the local community. If the body responsible for the procedure does not represent local authorities, the body may request the municipality to disseminate already prepared information and to confirm that the public has been notified. If the body does not receive the confirmation, it has to notify the public by itself.

Interested parties get familiar with the documentation

It is by means of publicly accessible records that interested parties have access to the application, to documents attached to the application (i.e. the EIA report), as well as to the decision issued, comments and recommendations supplied during the procedure, and to information on how they were considered. This means that interested parties should have access to the documents on the same day and free of charge for search of information.

Submitting comments and recommendations

According to Article 32 (1) (1) of the EPL Act, comments and recommendations must be submitted within the period of twenty-one days, starting from the day established by the body.

The situation of environmental organizations is, however, different. Environmental organizations may state their wish for participating in the procedure with the rights of a party if they gave their comments or recommendations. However, neither the EPL Act, nor the CAP specify the period within

which an organization must state such a wish; it must be, however, prior to issuing the decision. If the organization obtain the rights of a party in the procedure it may participate in any stage of the procedure.

Administrative trial

According to Article 32 (1) (2) of the EPL Act, the body responsible for issuing the decision may conduct an administrative trial open to the public. According to the provisions of Part II Chapter V of the CAP, the body should conduct an administrative trial if:

- It speeds up and simplifies the procedure,
- It ensures that educational objectives are reached,
- It is required by law,
- It is necessary to reach the agreement between different parties,
- It is necessary to consider the case with the participation of witnesses, experts or to submit it to an examination.

Such circumstances are quite frequent for the majority of procedures requiring the EIA report. Provisions of the CAP enable active participation not only of parties in the procedure and social organizations, but also of other subjects such as state and local organizational units, social organizations, witnesses, experts and other subjects, if their participation is justified.

All the aforementioned subjects should obtain a written summon stating the date, place and subject matter of the trial. If it is likely that apart from the parties summoned there exist other subjects that are not known to the body and that should be informed about the trial, the body should make public the information on the date, place and subject matter of the trial either by means of announcements or in a customary manner in a particular locality.

The requirement to sign the protocol (specified in Article 68 (2) of the CAP) applies to all the people actively participating in the trial. It is not necessary, however, that all the people who were just listening to the trial sign the protocol. On the other hand, if there are just a few people who did not take active participation in the trial, they may sign the protocol.

5.4 ROLES AND RESPONSIBILITIES

The sponsor, as the project proponent, will take overall responsibility for consultation with all the stakeholders during the EIA process.

The sponsor, this is, the Gdansk Water and Wastewater Infrastructure Company, has contracted representatives of the consultancy company Eptisa Internacional, who in co-operation with

representatives of the local Polish consultancy company Ekokonsult, will design the structure of all consultation activities. All these works shall be supervised and approved by the sponsor.

Sponsor responsibilities include:

- Responding to concerns and ideas raised through public consultation,
- Allocation of project financial, material and human resources to public consultation,
- Ensuring that all public and information disclosure requirements of investors are met, including the documentation of results.

Eptisa Internacional will undertake the EIA process and produce the draft and final EIA documents. Eptisa Internacional have commissioned the services of Polish local consultant, Ekokonsult, to assist them in the understanding of local issues.

The Eptisa Internacional and Ekokonsult role is one technical specialist and the responsibilities include:

- Background research on local demographic, socio-economic and organizational environments,
- Identification of stakeholders and stakeholder representation,
- Preparation of the initial PDCP to guide public consultation during planning and design activities,
- Implementation of public consultation activities,
- Analysis of the results of public consultation,
- Recording PCDP activities within the PCDP document, and
- Revisions of the PCDP at the time of the EIA finalization

The public disclosure and consultation will be parallel to the EIA process and will follow the following steps:

- Review of previous Public Consultation and Disclosure
- Identification of stakeholders
- Public consultation during preparation of EIA study
    - Organization of public hearings
    - Consultation to relevant authorities
- Public participation process for the draft EIA report
- Key issues identification and input of key issues into the EIA.

The following persons within Eptisa and Ekokonsult organizations will be in charge of conducting the activities mentioned above:

For Eptisa:

Dr. Carlota Arquiaga Thireau
Arapiles, 14
28010 Madrid, Spain
Tel.: 00 34 91 594 95 00
Fax: 00 34 91 594 95 41
E-mail address: carquiaga@eptisa.es

For Ekokonsult

Dr. Andrzej Tyszecki
ul. Koscierska 5
80-328 Gdansk-Oliwa
Poland
Tel.: 00 48 58 554 31 38
Fax: 00 48 58 554 31 39
E-mail address: atyszecki@ekokonsult.pl

Ms. Magdalena Kiejzik-Glowinska
ul. Koscierska 5
80-328 Gdansk-Oliwa
Poland
Tel.: 00 48 58 554 31 38
Fax: 00 48 58 554 31 39
E-mail address: mglowinska@ekokonsult.pl

The role of these persons is mentioned below for each of the activities.

The sponsor shall be informed, consulted and involved in all the consultations related to the project. The contact person at GIWK for public consultation and disclosure issues will be:

Ms. Anna Babis – Kludka
ul. Na Stoku 52
80-874 Gdansk
Tel. 00 48 58 326 67 18
Fax. 00 48 58 326 67 01

5.5 REVIEW OF PREVIOUS PUBLIC CONSULTATION AND DISCLOSURE

This task will consist of the review of all the information that in association with the development consent process of the subprojects carried out to date, are related to the public consultation and information disclosure activities, as required by Polish regulations.

For this, the main review document will be the Application for Assistance for the Cohesion Fund 2000-2006. Annex I. Environmental Impact Assessment, prepared by GIWK, and in particular all the Official Polish documents related to the permitting process attached to the application.

For projects screened in Annex II not needing an EIA study it will be checked that the official decision stating no need to carry out such an assessment has been entered into a publicly accessible data registry and the public notified.

For projects needing an EIA study, it will be checked that the EIA study was entered into a publicly accessible record and the public notified. Since public participation procedure in Poland is conducted only in those cases that require the EIA report, particular attention will be dedicated to the review of the documents related to the public consultation and disclosure activities carried out for these projects.

This task will be conducted by Dr. Carlota Arquiaga with the assistance of Ms. Magdalena Glowinska.

Identification of stakeholders

Stakeholder identification is undertaken to determine all of the organisms and individuals who may be affected by, interested in, or involved in the development proposed, and therefore should be informed and consulted about the project.

Stakeholders will be identified from the following groups:

- Public Administrations
- Non Governmental Organizations (NGOs)
- Scientific community (Universities, Polytechnical schools, scientific institutes)
- Local communities

This task will be mainly conducted by Dr. Andrzej Tyszecki, who has an extensive knowledge of the local demographic, socio-economic and organizational environments.

5.6 PUBLIC CONSULTATION DURING PREPARATION OF EIA STUDY

Two types of public consultation will be carried out in parallel to the preparation of the EIA study. These will be the organization of public hearings and the consultation to relevant authorities.

5.6.1 Organization of Public Hearings

Two open public hearings will be organized to present the Gdańsk Water and Wastewater Project to the inhabitants of the city of Gdańsk:

- An open public hearing for the non-governmental ecological organizations cooperating under the Gdańsk Agenda 21 project. This meeting will be held at the New Town Hall in Gdańsk on 7th October 2005 and will be presented by Mr. Skarbek – President of "Gdańska Infrastruktura Wodociągowo – Kanalizacyjna" Company.
- An open public hearing for the non-governmental ecological organizations and the authorities. This meeting will held at the New Town Hall in Gdańsk on 16th November 2005 and will be presented by Mr. Gajewski – Technical Director of "Gdańska Infrastruktura Wodociągowo – Kanalizacyjna" Company.

After each hearing, minutes of the meeting will be prepared, containing the following:

Attendees rooster,

Location and date of the hearings,

Overview of the issues discussed,

How the project sponsor responded to concerns raised.

Dr. Andrzej Tyszecki and Ms. Magdalena Glowinska will be in charge of the organization of these hearings.

5.6.2 Consultation to Relevant Authorities

This task will consist of the preparation of a Scoping Report describing the project and the key environmental setting features and its circulation amongst selected consultees whom will be asked to provide their opinions about the project, particularly with regards to the content and extent of the information to be provided in the EIA report.

The authorities who will be consulted are those which are likely to be concerned by the project by reason of their specific environmental responsibilities. These are Environmental, Sanitary, Marine and Nature Conservation authorities.

The scoping report will have the following information on the proposed project, according to Article 49(3) of the EPL Act:

1) Type, size and location of the project;

2) Area of the land occupied and that of the built structure as well as their previous uses and vegetation cover;

3) Type of technology used;

4) Possible alternative solutions of the project;

5) Quantity of water and other resources, materials, fuels and energy expected to be used;

6) Environmental protection measures;

7) Types and expected amounts of pollutants or energy emitted into environment when applying environmental protection measures;

8) Possible trans-boundary impacts;

9) Areas under protection, according to the Act of April 16, 2004 on the protection of nature that can be potentially affected.

Dr. Carlota Arquiaga, Dr. Andrzej Tyszecki and Ms. Magdalena Glowinska will participate in the preparation of the scoping report and its distribution to the consultees. The answers of the consultees will be reviewed by Dr. Carlota Arquiaga, and Ms. Magdalena Glowinska.

5.7 PUBLIC PARTICIPATION PROCESS FOR THE DRAFT EIA REPORT

Upon completion of the Draft EIA Report, this will be made available to the public for review and comments.

The process of public presentation of the Draft EIA Report will involve the following steps:

- Preparation of information to be released to the press so as to inform the public about the public meeting where the EIA report will be presented. This will be done in national and local newspapers.
- The Draft EIA Report will be displayed at the GIWK offices and the City Hall as well as on official GIWK and City Hall web-sides for a period of 3 weeks and the people will be invited to express their views on the assessment of environmental impacts and recommended mitigation and environmental protection measures, so that they can be taken into account and incorporated in the Final EIA Report.
- Preparation of two public meetings. This will be meetings with NGOs, but open to the public. These meetings will take place in downtown Gdansk, at the City Hall, and in Sobieszewska Island. In this meeting, the NGOs and general public will be invited to ask about the EIA and give their opinions.

Dr. Andrzej Tyszecki and Ms. Magdalena Glowinska will have a main role in organizing the public presentation of the Draft EIA report. Dr. Carlota Arquiaga will be with them to provide specific information about the preparation of the EIA that may arise.

5.8 KEY ISSUES IDENTIFICATION AND INPUT OF KEY ISSUES INTO THE EIA

The results of implementing the plan will be documented.

The EIA will contain a synopsis of the consultation carried out, including a table of issues raised and where they have been addressed in the report.

The Final EIA Report, with a summary of public comments and a description of how they have been taken into consideration in the Project, will be disclosed to the public at the same locations as the Draft EIA.

The results of the public consultation and information disclosure will also be included in the annual environmental and safety report, as agreed with the EBRD.

Dr. Carlota Arquiaga, with the assistance of Ms. Magdalena Glogowska, will be responsible for identifying the key issues raised during the public consultation activities and will incorporate them in the Final EIA report.

5.9 SCHEDULE

The PCDP activities described above will be completed by the indicated dates.

Review of previous Public Consultation and Disclosure: 30 November 2005

Identification of stakeholders: 30 September 2005.

Public consultation during preparation of EIA study

Public hearings: 07 October 2005 and 16 November 2005.

Scoping report sent to relevant authorities: 23 November 2005.

Public participation process for the draft EIA report: 20 Januaryr 2006 to 20 February 2006

EIA disclosure: 20 January 2006

Press advertasiment: 23 January 2006

Public meeting with NGOs in City Hall: 26 January 2006

Key issues identification and input of key issues into EIA: 20 Fabruary 2006.

5.10 PUBLIC CONSULTATION FINDINGS

5.10.1 Review of Previous Public Consultation and Disclosure

Background on the importance of public consultation given to this project

Public participation is a significant issue in the planning of water and wastewater management. Public consent and cooperation of the inhabitants give a possibility to work out the optimal solutions in the water and wastewater management. For this reason, the sponsor has made a significant effort to engage the public by conducting the informational campaign to probe the public opinion and the needs of the inhabitants of Gdańsk in the field of the city water and wastewater management.

Thus, for several years already, the Gdańsk Infrastruktura Wodociągowo – Kanalizacyjna Ltd. company has been running a dialog with the public opinion concerning the preparation of the tasks planned within the Gdańsk Water and Wastewater Project. The main aim of this action was to raise the public awareness about the issues of the water quality, water supply, and wastewater management, as well as to receive opinions, which may influence the Project's scope and the timetable of the construction works.

Engagement of the general public has been achieved through:

- frequent press releases,
- television debates and other tv programs,
- information on the websites of the Gdańsk City Hall and the Gdańsk Infrastruktura Wodociągowo – Kanalizacyjna Ltd.,
- meetings of the Mayor of Gdańsk and other representatives of the municipality with inhabitants of the housing districts, which has the most urgent requirements in the field of the water and wastewater management;

Within the last three years, several articles dealing with water and wastewater management issues have been published in the local press ("Dziennik Bałtycki", "Głos Wybrzeża", "Gazeta Wyborcza"). Within the context of the informational campaign concerning the Gdańsk Water and Wastewater Project, there were two special supplements of "Dziennik Bałtycki" published: "Debate about water" (18.10.2004) and "Debate about wastewater" (21.06.2005). Both supplements widely informed about the issues of the drinking water quality and wastewater management in Gdańsk, and presented the planned solutions.

As a result of the informational campaign, opinions of individual inhabitants and organized groups, concerning the water supply and wastewater systems, have been received. During the last years, the Gdańsk City Hall has received over 80 individual and group opinions concerning development of the

wastewater system in the following districts: Kiełpino Górne, Jasień, Orunia, Zabornia, Olszynka, Osowa, Barniewice, Klukowo, Łostowice, Św. Wojciech, the Sobieszewska Island.

The water and wastewater issues have also been discussed on the Forum of Local Agenda 21, created in 1997-1998, which is a platform for public consultation of the strategy of the city development. The Forum consists of representatives of inhabitants of Gdańsk, universities, industry, business, non-governmental organizations, and public administrations. Water and wastewater management issues had regularly been discussed in ten meetings of the Forum organized in years 2001-2005.

Public Consultation in the context of the EIA procedure for sub projects 05, 10, 18, 26 and 28

Public participation procedure in Poland, which is a part of the EIA procedure, is conducted only in those cases that require the EIA report.

In accordance with public participation regulations set in the Environmental Protection Law (EPL) Act of 27 April of 2001, the decisions of the President of the City of Gdańsk stating no need to carry out an environmental impact assessment study have been entered into a publicly accessible data registry for each of the Annex II subprojects screened and determined not to need further environmental assessment. These regulations specify that for projects for which the EIA report is not required the public is not notified about conducting the procedure, but the information on issuing the decision on the lack of obligation to prepare the report should be placed in publicly accessible records

For those sub projects requiring the EIA report, the decision to carry out the EIA study and the EIA study itself have been entered into publicly accessible registries and the public notified according to Polish regulations on public participation.

Annex I projects

05. Rebuilding of Lipce water intake and water treatment plant

28. Extension of Wastewater Treatment Plant Gdańsk Wschód – step II b – sludge management, adjustment to stricter nitrogen removal requirements

In these two cases, the EIA report was submitted together with the application for a location decision of a public investment, without conducting a "preliminary procedure", where, prior to initiating the procedure for issuing the decision, the applicant asks the relevant body to issue an interim decision on the scope of the EIA report.

The applications and the EIA reports were entered into publicly accessible data registries. The announcement of entering the application and the EIA report into the publicly accessible data registry was then posted on the Internet by the President of the City of Gdansk.

In both cases proceedings with social participation were conducted after the EIA report was entered into a publicly accessible data registry.

Annex II projects

10. Rebuilding of water intake and water treatment station Dolina Radości.

18. Extension of Wastewater Treatment Plant Gdańsk-Wschód-step III-connection of Wastewater Treatment Plant Zaspa discharge area.

26. Building a sewage system for Kiełpino Górne district.

For these three cases, the president of the City of Gdansk first issued decisions requiring the need to carry out an EIA study, which were entered in publicly accessible data registries.

For these projects, an application for location decision was entered into the publicly accessible data registry. The decision on the need to carry out an EIA study and the EIA report, were then made public at the same time. The announcements of entering the application, the EIA report and the decision into the publicly accessible data registry were then posted on the Internet by the President of the City of Gdansk.

In all three cases, public consultation was conducted once the EIA report was submitted.

During these public participation processes, opinions and remarks were received regarding the task of reconstruction of the water intake and water treatment station in Dolina Radości. The "Wrzeszcz Citizen Committee" presented the following remarks and reservations about the planned project:

- adaptation of the water intake capacity to the maximum level of water abstraction allowed in the water supply consent of 2 December 2003,
- maximum use of the existing infrastructure of the water intake to minimize the area on which the nature will be destroyed,
- renouncing to planned new buildings so as to avoid nature destruction.

These remarks are to be taken into account in the technical design.

5.10.2 Identification of Stakeholders

The following groups of stakeholders have been identified as having an interest or role in the Gdansk Water and Wastewater project.

Public Administrations:

Gdansk city commune authority

Powiat Sanitary Inspector

Vovoid Sanitary Inspector

Marine Board authorities

Vovoid

Nature Conservation authorities

Selected non-Governmental Organizations (NGOs) cooperating under the Gdańsk Agenda 21 project, related to the Gdansk Water and Wastewater Project :

Inhabitants for the Environmental Protection – Dolne Miasto Association

"Healthy Gdańsk" Association

Friends of the Orunski Park

Friends of Sobieszewska Island

Old Oliwa Association

League of Nature Conservation

Ecological Association "Osowa"

Polish Ecological Club

ECO-BALTIC

Waterbirds Exploration Group "Kuling"

Polish Society of Birds Conservation

Nature Association "Healthy Gdansk"

Association Barniewice

Polish Society of Tourism and Sightseeing Gdansk Section

Scientific Community:

Ornithological Institute of the Polish Academy of Science

Inhabitants of Gdansk

5.10.3 Public Consultation during Preparation of EIA Study

Two public hearings and a consultation to relevant authorities have been carried out during the preparation of the EIA study.

5.10.3.1 Public hearings

Two open public hearings have been held to present the Gdańsk Water and Wastewater Project to the inhabitants of the city of Gdańsk:

- An open public hearing for the non-governmental ecological organizations cooperating under the Gdańsk Agenda 21 project. This meeting took place at the New Town Hall in Gdańsk on 7th October 2005.
- An open public hearing for the non-governmental ecological organizations and the authorities. This meeting took place at the New Town Hall in Gdańsk on 16th November 2005.

These meetings were preceded by press conferences of the Deputy Major of Gdańsk, for spreading the information about the project and the conditions of its implementation through the local mass media.

These meetings are part of the series of meetings of the Forum of Local Agenda 21, where water and wastewater management issues have regularly been discussed since 2001.

The aim of the last two meetings was to receive opinions at the stage of preparation of the Environmental Impact Assessment report of the entire Gdańsk Water and Wastewater Project on what specific issues should be analyzed in the report.

Minutes of the public hearing of 07 October 2005

Open public hearing for the non-governmental ecological organizations cooperating under the Gdańsk Agenda 21 project.

Public invited

Inhabitants for the Environmental Protection – Dolne Miasto Association

"Healthy Gdańsk" Association

Friends of the Orunski Park

Friends of Sobieszewska Island

Old Oliwa Association

League of Nature Conservation

Ecological Association "Osowa"

Polish Ecological Club

ECO-BALTIC

Waterbirds Exploration Group "Kuling"

Polish Society of Birds Conservation

"Healthy Gdansk" Association

Polish Society of Tourism and Sightseeing Gdansk Section

Ornithological Institute of the Polish Academy of Science

Attendees rooster

Inhabitants for the Environmental Protection – Dolne Miasto Association

"Healthy Gdańsk" Association

Friends of the Orunski Park

Ornithological Institute of the Polish Academy of Science

Saur Neptun Gdansk

GIWK

EKO-KONSULT

City Authorities

Report of the meeting

The open public hearing for the non-governmental ecological organizations cooperating under the Gdańsk Agenda 21 project has been organized in the New Town Hall in Gdańsk on 7th October 2005. It was one of the planned meetings presenting the Gdańsk Water and Wastewater Project to the inhabitants of the city of Gdańsk.

The project was been presented by Mr. Skarbek – President of "Gdańska Infrastruktura Wodociągowo – Kanalizacyjna" Company. The Environmental Impact Assessment Report of the Gdańsk Water and Wastewater Project was presented by Mr. Tyszecki from Eko-Konsult Project & Consultancy Service. After the presentation of the Gdańsk Water and Wastewater Project, the floor has been given to the representatives of the ecological organizations, which has attended the meeting.

Solutions adopted in the Gdańsk Water and Wastewater Project have been approved and received positively by the participants of the meeting. Especially, the initiative of closing of the surface water intake in Straszyn has gained recognition.

Mrs. Olejowska, the representative of the Inhabitants for the Environmental Protection – Dolne Miasto Association, informed that in 70-ies she was one of the scientists that were against construction of the

surface water intake in Straszyn. On the basis of available researches and experiments, they had assumed that Gdańsk was secured with significant groundwater resources, which could cover present and future demands for water, and that the trend of raising of the Tertiary and Quaternary water levels had been already observed that time.

Moreover, she pointed at the problem of the utilization of the sewage sludge for reclamation of phosphate waste heap. The phosphate waste is the source of ground and water pollution and their impact on the groundwater environment is heighten by another pollution coming from the sewage sludge. She expressed her hope that solutions adopted in the Project would contribute to the best and the most secure utilization of the sewage sludge. However, she insisted also on not waiting for the change of the method of sewage sludge utilization till the end the Project implementation.

The construction of a new hypermarket, planned by the municipality, has been the third issue discussed in the meeting. The hypermarket is planned to be located partially within of a protection zone of the Czarny Dwór water intake, which makes inhabitants concerned about possibility of contamination of the water intakes as a result of a project implementation.

In reply to the above mentioned issues, Mr. Skarbek presented the following information:

- The Czarny Dwór water intake is a modern and important water intake in the municipal water supply system, so "Gdańska Infrastruktura Wodociągowo – Kanalizacyjna" Company will be opposed to the presented plans of the hypermarket location within the protection zone.
- Sewage sludge is planned to be used for construction of the A1 motorway, therefore, it will no longer be disposed on the phosphate heaps as it is now.

The issue of the threat to the Czarny Dwór water intake has been raised also by the other participants of the meeting, including Mrs. Kazanowska, a representative of the "Healthy Gdańsk" Association. Apart from the hypermarket construction, the water intake may be endangered also because the road system in the area is not supported by the rain water collection system, what may cause a threat of infiltration of the pollution to the ground during the torrential rains. This problem, connected with the raising ground water level, may endanger both water intakes, Czarny Dwór and Zaspa.

In reply, Mr. Skarbek explained that the wells in the Czarny Dwór water intake draw water from a depth of a few dozen meters, so water does not undergo a rapid degradation as a result of the surface impacts.

Prof. Gromadzki from the Ornithological Institute of the Polish Academy of Science, addressed two questions:

- Local necessity of wider analyses of the raising groundwater level, which causes local

groundwater loggings in some areas of the city;

- The second issue raised the conflict between the inhabitants of the Sobieszewska Island and the municipality. As it was presented, inhabitants of the Sobieszewska Island protest against the planning fees imposed by the municipality. Both the representatives of inhabitants of this district and "Gdańska Infrastruktura Wodociągowo – Kanalizacyjna" Company declared their will to straighten out this issue and to organize a separate meeting to clear up the doubts concerning the Project implementation on the Sobieszewska island.

Mr. Skarbek assured, that the informational meetings with inhabitants will be organized. He also informed that the Company is discussing with the municipality a possibility of departing from the planning fees.

Mrs. Kazanowska, as an inhabitant of the Sobieszewska Island, offered her help to organize mediation with inhabitants of the island.

A representative of the Friends of the Oliwa Park association expressed fears of negative impact of the modernization of the "Orunia" water reservoir located in the vicinity of the amenities of the park. This referred to the technical infrastructure, which is planned to cut through the Park and to the subsequent threats to the picturesque slopes of the Oruński Stream Valley.

He mentioned also an issue of groundwater loggings in Orunia district as a result of raising of a ground water level.

At the closing of the meeting, President Skarbek thanked the stakeholders for their participation as well as for their valuable remarks, and invited to the next meetings.

Minutes of the public hearing of 16 November 2005

Open public hearing for non-governmental ecological organizations cooperating under the Gdańsk Agenda 21 project and official organisms that are giving opinions about environmental decisions.

Public invited

Public authorities:

Deputy Head of the Department of Environment and Agriculture of the Pomeranian Voivodship

Regional Nature Conservator

Director of the Maritime Office

Regional Sanitary Inspector

County Sanitary Inspector

NGOs:

Inhabitants for the Environmental Protection – Dolne Miasto Association

"Healthy Gdańsk" Association

Friends of the Orunski Park

Friends of Sobieszewska Island

Old Oliwa Association

League of Nature Conservation

Ecological Association "Osowa"

Polish Ecological Club

ECO-BALTIC

Waterbirds Exploration Group "Kuling"

Polish Society of Birds Conservation

"Healthy Gdansk" Association

Polish Society of Tourism and Sightseeing Gdansk Section

Ornithological Institute of the Polish Academy of Science

Attendees rooster

Inhabitants for the Environmental Protection – Dolne Miasto Association

Friends of the Orunski Park

League of Nature Conservation

Powiat Sanitary Inspector

Friends of Sobieszewska Island

Polish Eco-business Club

Association Barniewice

"Healthy Gdansk" Association

Shipyard "Polnocna"

Saur Neptun Gdansk

Marin Port "Gdanski"

GIWK

EKO-KONSULT

City Authorities

Olszynka Estate Board

Baltic Malt

Gdansk Development Bureau

Report of the meeting

The open public hearing for the non-governmental ecological organizations cooperating under the Gdańsk Agenda 21 project has been organized in the New Town Hall in Gdańsk on 16th November 2005. It was the second and last meeting of the planned round of public hearings presenting the Gdańsk Water and Wastewater Project to the inhabitants of the city of Gdańsk. The project was presented by Mr. Gajewski – representative of "Gdańska Infrastruktura Wodociągowo – Kanalizacyjna" Company. The Environmental Impact Assessment Report of the Gdańsk Water and Wastewater Project was presented by Mr. Tyszecki from EKO-KONSULT Project & Consultancy Service. After the presentation of the Gdańsk Water and Wastewater Project, the floor was given to the public who attended the meeting.

The following issues were raised again during this meeting:

- doubts about closing of the Straszyn water intake,
- amount and availability of the ground water resources when the water intake is increased,
- threat of contamination of the Czarny Dwór water intake,
- environmentally friendly utilization of the sewage sludge from the "Wschód" wastewater treatment plant,
- raising of the ground water level.

Remarks of Mrs. Kazanowska, a representative of the "Healthy Gdańsk" Association, were the new voice in the discussion on the water consumption in Gdańsk. She brought the attention to the fact that the precious ground water should not be consumed by the industry, e.g. the Gdańsk Shipyard, where they would rather use water from the surface water intake in Straszyn.

Mr. Świeczkowski, a representative of the Gdańsk Shipyard, explained that the shipyard has its own wells with Cretaceous and Quaternary water. Also he informed, that the water contains supra-

standard amounts of fluorides (Cretaceous water) and manganese (Quaternary water), so it should undergo additional treatment before it is suitable for drinking.

Mr. Bryks, a representative of the Friends of the Oliwa Park association, took the floor to complain against the construction of the additional Orunia water reservoirs, located on the slopes of the Oruński Stream Valley, in the vicinity of the historic Orunia Park. He pointed out, that the construction works, which interfere with the structure of the slopes, might endanger both their stability and the safety of the entire Park.

Mr. Gajewski explained that the water reservoirs were necessary for the retention of the developed water supply system. At the same time, he assured that the construction works would be conducted only on the closed area which is already owned by Gdańska Infrastruktura Wodno – Kanalizacyjna Company.

Mrs. Borowska-Gala, a representative of the Olszynka District Council, and Mrs. Banaszak, from the Barniewice Association, asked for information on the exact dates of start of the construction works in their districts.

Mr. Gajewski assured that construction works of the sewage system in Olszynka, Barniewice and Osowa districts had the highest priority and would start as soon as the financing of the project is fixed.

Mr. Lorek, the Head of the Environmental Protection Department of the Gdańsk City Hall thanked for the attendance as well as for the valuable remarks, and adjourned the meeting on the Gdańsk Water and Wastewater Project.

Summary of environmental key issues identified during these meetings

Concern about the utilization of the sewage sludge for reclamation of phosphate waste heap, which is a source of ground and water pollution added to that of the sewage sludge. Solutions adopted in the Project should contribute to the best and the most secure utilization of the sewage sludge.

Concern about the potential pollution of the Czarny Dwór water intake due to:

- Construction of a new hypermarket, planned to be located partially within a protection zone of the Czarny Dwór water intake
- The road system in the area, which is not supported by the rain water collection system, what may cause a threat of infiltration of the pollution to the ground during the torrential rains.

Request for wider explanation on the issue of the ground water level raising on the lower terrace of Gdańsk since, according to the opinion of scientists, this trend is based on natural conditions

Concern about need for wider analyses of the raising groundwater level, which causes local groundwater loggings in some areas of the city. Specific concern about groundwater loggings in Orunia district as a result of raising of the ground water level was raised.

Fear of negative impact of the modernization of the "Orunia" water reservoir (task 16). The new water reservoirs planned to be located on the plot where already two Orunia water reservoirs exist, will endanger the values of the Oliwski Stream Valley, protected by law (as a natural and landscape complex protected by the Nature Protection Law), as well as the Orunia Park (protected by the heritage conservator).

5.10.3.2 Consultation to Relevant Authorities

The following representatives of the environmental authorities and the sanitary inspectorate were also involved in the process of the public consultation:

- Deputy Head of the Department of Environment and Agriculture of the Pomeranian Voivodship
- Regional Nature Conservator
- Director of the Maritime Office
- Regional Sanitary Inspector
- County Sanitary Inspector

The above mentioned officials were invited to the meeting of the Local Agenda 21, which was held on 16 November 2005. Moreover, on the 23rd of November 2005, they were sent a Scoping Report describing the project and the key environmental setting features with the location of the planned tasks against the background of the protected areas. They were asked to present their opinion on the scope of the environmental impact assessment report, which is being prepared for the entire Project.

Two of the the above mentioned authorities have submitted the following remarks:

- Regional Sanitray Inspector – it is important to pay attention on "Zaspa" and "Czarny Dwór" water intakes during demolition of WWTP Zaspa.
- Regional Nature Conservator – it should be considered in the EIA that the Project should not impact on any protected areas, especially Natura 2000 sites.

All submitted remarks were taken into account in this EIA repot.

5.10.4 Public Participation Process for the Draft EIA Report

Upon completion of the Draft EIA Report, it was made available to the public for review and comments from 20th of January to 20th of February 2006. An electronic version of the Report was

available on City and Investor web pages (www.gdansk.pl, www.giwk.p) as well as hard copies disclosed in the City Hall and Investor's office.

The announcement and information about the public meeting to present and discuss the results of the EIA report was disclosed on the web pages of the City and GIWK as well as in the local newspaper *Dziennik Blatycki*. Moreover, all non-governmental organisations as well as administrative authorities and estate boards were invited by mail.

The public meeting was scheduled for 26 January 2006 at 16:00.

Minutes of the public hearing of 26 January 2006

On Thursday, 26 January 2006, a public hearing was held, which represented part of the final step of the public consultation process that has been conducted in parallel to the preparation of the Environmental Impact Assessment (EIA) of the Gdańsk Water and Wastewater Project, as required by the EU Directives and the European Bank of Reconstruction and Development procedures.

The aim of the meeting was to present to the inhabitants of the city of Gdansk the results of the report on the EIA of the Gdansk Water and Wastewater Project, prepared on behalf of the Gdańska Infrastruktura Wodociągowo–Kanalizacyjna Company (GIWK) by the Spanish company Eptisa Internacional, with the assistance of the local Polish company Ekokonsult.

The general public was invited to attend the meeting through announcements posted in the local newspaper and the web pages of the city of Gdansk and GIWK. Non-governmental organisations as well as administrative authorities and estate boards were invited by mail.

Public invited

Brzeźno Estate Board

Osowa Estate Board

Kokoszki Estate Board

Strzyża Estate Board

Krakowiec - Górki Zachodnie Estate Board

Olszynka Estate Board

Letnica Estate Board

Rudniki Estate Board

Wyspa Sobieszowska Estate Board

Regional Nature Conservator

Director of the Maritime Office

Voivod Sanitary Inspector

Powiat Sanitary Inspector

Department of Environmental Protection City of Gdansk

Voivod Found for Environmental Protection and Water Management in Gdansk

Inhabitants for the Environmental Protection – Dolne Miasto Association

Friends of the Orunski Park

Friends of Sobieszewska Island

Old Oliwa Association

League of Nature Conservation

Ecological Association "Osowa"

Polish Ecological Club

ECO-BALTIC

Waterbirds Exploration Group "Kuling"

Polish Society of Birds Conservation

Ornithological Institute of the Polish Academy of Science

Local Initiative Association Orunia

Citizen Committee from Wrzeszcz

University of Gdansk

Technical University in Gdansk

Heat and Power Plant „Wybrzeże"

Waste Disposal „Szadółki"

Development of Gdansk City Office

Saur Neptun Gdansk

Board of Gdansk Harbor

Bureau for Development of Technologies „Lotos" S.A.

Materials

Materials made available to the public during the meeting included:

- Fact sheet prepared by GIWK
- Copies of the presentation made by GIWK
- Copies of the EIA presentation made by Eptisa and Ekokonsult
- Summary maps of main environmental features of the project
- Copies of the EIA draft report

Attendees rooster

Kokoszki Estate Board

Olszynka Estate Board

Department of Environmental Protection City of Gdansk

Voivod Sanitary Inspector

Friends of the Orunski Park

Friends of Sobieszewska Island

Citizen Committee from Wrzeszcz

Heat and Power Plant „Wybrzeże"

Waste Disposal „Szadółki"

Board of Gdansk Harbor

Association „Healthy Gdansk"

Voivod Found for Environmental Protection and Water Management in Gdansk

Deputy Head of the Department of Environment and Agriculture of the Pomeranian Voivodship

Report of the meeting

Mr. Jacek Skarbek, President of the Gdańska Infrastruktura Wodociągowo–Kanalizacyjna Company (GIWK), welcomed everybody and shortly described the aim and the agenda of the meeting. He also explained briefly about the application for Cohesion Funds made by GIWK in order to finance the project as well as the involvement of the European Bank for Reconstruction and Development and the associated requirement of an EIA for the entire project as part of this financing process.

Mr. Ryszard Gajecwski, Director of GIWK, followed, who shortly presented the basic aims of the Project and the planned ways of the implementation. In his presentation, he also mentioned the issues which were discussed on the previous public hearings, regarding:

- Works in the vicinity of The Oruński Stream Valley Nature and Landscape Protection Area
- Tasks to be conducted on the Sobieszewska Island and the contentious issues of the spatial planning fees.
- Groundwater in the lower terrace of Gdansk city.

The presentation of the results of the EIA report was then made by Dr. Carlota Arquiaga, the Project Team Leader of the Spanish engineering company Eptisa Internacional contracted to prepare the EIA. She first made a short presentation of the Eptisa company with the aim of showing the attendants the involvement of the company in the implementation of public civil works, from the design stages to the supervision and control construction works.

Then Dr. Arquiaga presented the most important results of the Environmental Impact Assessment. She explained the requirements of the Cohesion Fund and EBRD concerning the need for an EIA of the entire project and the process that must be followed; next she presented the results of the review of the scoping and screening procedures for the tasks of the Project; then the positive and negative impacts of the Project, as well as the mitigation measures to be implemented, especially in the construction phase. The presentation was illustrated with theme maps prepared with a Geographical Information System (GIS), which were superimposed to assess the sensitivity of the environment to the project's impacts.

Dr. Arquiaga's was the only presentation in English, which was simultaneously translated to the attendants by Ms. Magdalena Glowinska, of Ekokonsult.

After the presentations, the floor was given to the representatives of the ecological organizations and the inhabitants of Gdansk.

Mr. Jerzy Krajka, of the *Friends of Orunia Park Association* expressed his fear that the explanations regarding the construction works planned in the vicinity of The Oruński Stream Valley Nature and Landscape Protection Area are not satisfactory. He indicated there was no information on the pipelines which would cut the Orunia Park.

Mr. Gajewski explained that the task located in the neighborhood of the park only consists of the construction of two reservoirs on land owned by the Gdańska Infrastruktura Wodno – Kanalizacyjna Company (GIWK), and no new pipelines are planned.

The issue of the closure of the surface water intake from Straszyn was brought about by the representatives of the *Friends of Orunia Park Association* and *Friends of Sobieszewska Island*.

The representatives of GIWK explained that the aim of the Project is to eliminate the water intake in Straszyn, but they underlined, also, that the closure would be decided not earlier than the project is implemented, when it will be known if closure of this water intake is possible.

The next array of questions were asked by Ms. Krystyna Jackowska, a representative of the Wrzeszcz Citizen Committee, who was less satisfied than the rest about the EIA. She mentioned the following issues:

- the lack of preventive measures for the sewer near the Czarny Dwór water intake, which may endanger the intake through contamination,
- the modernization of the Dolina Radiści water intake, located within the Tri-City Landscape Park, which is a threat to natural values, including the planned nature reserve,
- the planned use of the granulate produced from sludge drying in the Gdańsk-Wschód WWTP.

Mr. Gajewski explained that the change of sewers is a part of the project as a consequence of the closure of the Zaspa WWTP. Project of modernization of the Dolina Radości water intake is under consultation with the authorities of the Tri-City Landscape Park and is being planned with a special care to minimize the impacts of the modernization. Extension of the existing buildings is not planned.

With regards to the granulated sludge, he indicated the sludge will be dewatered and sanitized, and the produced granulate may be used as a fertilizer for green areas or combusted. Combustion of the granulate is planned as a result of cooperation with the heat and power plant.

At the closing of the meeting, Mr. Jacek Skarbek thanked the public for their attendance and valuable remarks, and expressed his hope for future cooperation. He also informed that the EIA report is available to the public until 20 February, which is the deadline for submitting remarks and motions to the report (this information was also included in the newspaper add and the web pages).

The meeting was adjourned at 18:15.

5.10.5 Comments Received During the EIA Public Disclosure Period

Three letters were received during the Gdansk Water and Wastewater Project EIA disclosure period, between 20 January 2006 and 20 February 2006. A fourth letter from Citizen Committee from Wrzeszcz was received on January 21; the letter was dropped in the post on February 17.

A summary of these letters with the relevant information regarding the remarks to the EIA report and the project is provided.

Letter from 14 February 2006 - Friends of Orunski Park

In the letter it is stated that Friends of Orunski Park are glad that the Project will proceed, but they express their wish to take part in task 16, both during project preparation as well as during construction works so as to make sure that all the environmental values of Orunski Park are preserved.

Letter from 19 February 2006 - Olszynka Estate Board

The letter included the remarks and questions mentioned below:

1. What kind of impacts are likely to appear in groundwater during construction works concerning high groundwater levels in the Olszynka Estate?
2. The following streets should be included in the report since they are included in the Project: Miedza, Wspólna, Zagony, Pusta, Krótka, Goździkowa, Kacza i Olszyńska.
3. Explain the function of the pumping stations in the water and wastewater system, the manners of informing about operation failure as well as noise emission.
4. Explain what the city is going to do about the numerous groundwater-logging problems in Olszynka Estate.
5. It is requested to include streets Łanowa, Modra and Zawodzie in the Gdansk Water and Wastewater projec".

Letter from 20 February 2006 – Green Olszynka Association

It is requested to include streets Łanowa, Modra and Zawodzie in the Gdansk Water and Wastewater projec".

Letter from 21 January 2006 - Citizen Committee from Wrzeszcz

The following remarks and questions are made in this letter:

1. Some of the proposed investments worked out in the 1993 "Program for repairing and modernization of water and wastewater network in Gdansk" have not been implemented. Why the "Gdansk Water and Wastewater Project" does not refer to this Program?
2. In the task 18 (WWTP Zaspa) it should be considered the sewer pipe that is partly destroyed by corrosion and endangers groundwater resources in Czarny Dwor water intake.
3. Who is responsible for obtaining the decision on the protection zone for water intake "Czarny Dwor-Zaspa"? (The previous decision has expired).

4. Reservations about task 10 (Reconstruction of water intake and water treatment plant Dolina Radosci) – it is over scaled and planned without any care about environmental values.
5. What is the purpose of public consultation and the presentationof the draft EIA report and how does this refers to the localization decision obtained for this investment?
6. Information about further consultation process is missing in the draft EIA report.

Responses to these remarks and questions have been the following:

- Request of Friends of Orunski Park to participate in task 16 during project preparation and construction works: Where the affected public is particularly interested, the EBRD encourages or requires project sponsors to commit to on-going information and communication programmes. Therefore, GIWK will keep all interested public informed on the tasks.
- Impacts during construction on high groundwater levels in the Olszynka Estate: Olszynka is located in an area below sea level (down to –1,80 m b.s.l.). Groundwaters and rainoff water in the Olszynka area are permanently drained through a network of drainage ditches, dewatering channels and Pumping station Nº 21 "Orunia". Thus, the groundwater level depends partly on natural conditions and partly on the drainage system efficiency. In this regards, it is important to avoid any kind of destruction or disturbance of the drainage system during construction works. The competent authorities have gathered opinions from the sanitary and environmental authorities regarding the likelihood of significant negative impacts for tasks to be performed in this area, and have determined that construction activities will not cause any significant impacts (including impact on groundwater levels), therefore the preparation of an environmental impact assessment report for this task not being necessary.

  Technical documentation prepared for subtasks III-V, together with technical documentation for sub task VI (task 25) that is presently in preparation, takes into consideration these specific environmental conditions in Olszynka.
- Missing streets: These streets were not included in the Polish version of the EIA by mistake. These streets were included in the English version, except for Gozdzinkowa and Kacza streets, also because of a mistake. All five streets -Miedza, Wspólna, Zagony, Pusta, Krótka, Goździkowa, Kacza and Olszyńska- will be included in the description of the project. These streets were correctly represented as part of tasks 6 and 25 in the Figures of the EIA.
- Explanation of the function of the pumping stations and information on operation failure of the pumping stations: pumping stations will be equipped with two pumps (including a reserve one), flow meter, and other equipment necessary for the automatization of the pumping process. Also, there will be operation monitoring equipment that will inform about any failures.

- Noise emissions from pumping stations: According to Polish environmental regulations, any new or existing facilities should operate in such a way as to not exceed noise standards. Accordingly,the construction of the pumping stations will be underground, thus minimizing any noise impact.
- What the city is going to do about the numerous groundwater-logging problems in Olszynka Estate: As already explained, the high groundwater levels in the Olszynka Estate occur because of natural conditions and, therefore, logging conditions do not depend solely on the performance of the drainage system. The purpose of this project **is not** regulating naturally occurring high groundwater levels; however, groundwater abstraction to be implemented as part of this project is expected to lower groundwater levels, including those of the Olskynka Estate. This fact will be checked with the monitoring system to be installed as part of the project (task 1) that will allow a close control of GW levels, and eventually assist in taking a decision about solutions to the groundwater-logging problem.
- Request to include streets Łanowa, Modra and Zawodzie in the Gdansk Water and Wastewater project: these streets are not included and will not be included in this project. The scope of work for Olszynka Estate was settled when the feasibility study for the "Gdansk Water and Wastewater Project" was prepared. After the European Commission has taken the decision to co-finanse this Project with Cohesion Funds, it is not possible to broaden the project's scope. This fact, however, does not eliminate the possibilities of GIWK making further investments in this area.
- Proposed investments in "Program for repairing and modernization of water and wastewater network in Gdansk": This program is on going, but according to the financial possibilities of the City, some elements of this Program have been rescheduled.
- Sewer pipe in task 18 (WWTP Zaspa): After technical assessment and cost analyses, GIKW decided to postpone the renovation of this sewer pipe.
- Responsibility for obtaining decision of protection zone for water intake "Czarny Dwor-Zaspa" (previous decision expired): the decision has been extended until the end of the year 2006. Presently, a draft conception of a new protection zone is under consultation.
- Reservations about task 10: (reconstruction of water intake and water treatment plant Dolina Radosci) – it is over scaled, and planned without any care about environmental values: The purpose of the task 10 is to reconstruct the water intake so as to restore its efficiency, which because of the effect of well colmatation is constantly decreasing. This investment is planned with due respect to the environmental values - in the location decision there are included

environmental conditions of the investment implementation aimed at reducing the risk of damaging environmental values.

- Purpose of the public consultation and presented draft EIA report and how does it refer to the localization decision obtained for this investment: It is assumed the question refers to task 10. There is no connection between the obtained localization decision for task 10 and the draft "Environmental Impact Assessment of the Gdansk Water and Wastewater Project" the presented on 26th of January 2006. The EIA was prepared in accordance with EU and EBRD procedures and will allow to start negotiations with EBRD to co-finance the Project.

  Generally, the purpose of the EIA report was to ensure that a proper environmental process was carried out by GIWK an Polish authorities; this is why it greatly emphasizes on the screening and scoping processes. In this EIA, the whole Project has been a subject to the EIA process in a way that conforms European guidelines.

  The purpose of the public meeting of 26th of January 2006 was to present the results of the EIA carried out for the whole Gdansk Project, with special attention on those subjects that arouse during the previous public meetings of 7th of October and 16th of November 2005.

  Further consultation process in EIA: Public meeting on 26th of January 2006 was a final element of public consultations carried out during EIA process for the "Gdansk Water and Wastewater Project" since October 2005. With regards to the post EIA process information and reporting activities, the EBRD Consultation and Disclosure Requirements indicate that for all categories of projects where significant environmental issues have been raised, or where the affected public is particularly interested, the EBRD will encourage or require project sponsors to commit to on-going information and communication programmes. For A-level projects, the Bank requires project sponsors to provide an annual environmental report to the affected public locally and will encourage the release of this information of the project sponsor's website.

5.10.6 Key Issues Identification

This section and the following one summarize the key issues identified during the public consultation and disclosure process and how and where in the EIA report have been addressed.

The key issues identified during the public participation processes mainly concern aspects associated to subprojects 10, 16, 18 and 28.

Serious public concern has been detected on groundwater issues, both regarding the availability of water resources as their vulnerability. Specific issues were raised regarding Czarny Dwór, Zaspa and Dolina Radości water intakes.

For the Czarny Dwór water intake, concern is mainly on contamination threats from the construction of a new hypermarket in the groundwater protection zone and from the road system in the area, which is not supported by the rain water collection system. In connection with the project itself, the fear of a potential contamination related with the change of the sewers associated to the closure of the Zaspa WWTP has been expressed. Also, the potential affection to this water intake, as well as that of Zaspa, during the demolition of the Zaspa WWTP, has been emphasized.

For the water intake at Dolina Radości (task 10), the main concern has been expressed on ensuring compliance with the maximum level of water abstraction allowed in the water supply consent of 2 December 2003.

Significant concern has also been observed for the problem of groundwater raising levels in the lower terrace of Gdánsk, which causes flooding in some areas of the city, with the water entering the cellars, i.e. in Orunia district. Even though, scientists appear to attribute this trend to natural conditions, the citizens demand additional studies.

Landscape and nature conservation are as well issues of concern among the inhabitants of Gdánsk. In particular, the rebuilding of the water intake and water treatment station Dolina Radości (task 10), and the building of the new pumping station and the water reservoirs in the area of Orunia (task 16).

For the Dolina Radości site, requests have been made for a maximum use of the existing infrastructure and renouncing to planned new buildings so as to minimize nature destruction.

As for the works to be implemented in the area of Orunia, the citizens fear the negative impact the new water reservoirs will have on the values of the Oliwski Stream Valley and the Orunia Park.

The possibility of closing the surface water intake from Straszyn is an issue that also matters the inhabitants of Gdansk, who would like this source of water decommissioned.

The need for preventing the affection of any protected areas, especially Natura 2000 sites, has been stated by the authorities consulted.

Finally, concern about the utilization of the sewage sludge of the "Wschód" wastewater treatment plant (task 28) has also been expressed. Solutions contributing to the best and the most secure utilization of the sewage sludge, have been requested.

The conflict between the inhabitants of the Sobieszewska Island and the municipality with regards to the fees the municipality wants to impose, and to which the inhabitants of the Sobieszewska Island are opposed, is also an important issue, although not strictly an environmental one.

5.10.7 Input of Key Issues into the EIA

This section indicates, in a table format, the parts of the EIA report where the key issues identified during the public participation process as well as in the scoping process (sections 5.10.5 and 6.3) have been addressed, with a brief description on how they have been addressed.

KEY ISSUE	PART OF THE EIA WHERE KEY ISSUE IS ADDRESSED
Specific issues	
Odours from sludge treatment facilities (task 28)	The negative impact of odours from the operation of the Woshd WWTP has been assessed in section 9.3.3.2. Necessary mitigation measures (including specific ones for sludge treatment facilities) and monitoring activities are described in sections 10.2.1 and 11.2.2. In assessing this impact, it has been taken into account the offsetting effects of the improvement of the Wschod WWTP, the demolition of the Zaspa WWTP, the elimination of cesspools and septic tanks in the areas that will be served with the new sewer pipeline network.
Noise from sludge treatment facilities (task 28)	The noise and vibration effects from the operation of the WWTP and pumping stations is assessed in section 9.3.2.3 It has been considered as not significant since mitigation measures incorporated in the design are normally efficient. Noise prevention measures for both the construction and operational phases are nonetheless identified in section 10.2.2. Also noise control measures are proposed in the Monitoring program described in chapter 11.
Groundwater contamination from: • sewage sludge and reclamation of phosphate waste heap (task 28) • installed sewage pipelines (tasks 2 to 18) • demolition of Zaspa WWTP (task 18)	The significance of the impacts on groundwater quality is addressed in section 9.3.1.5 where the vulnerability of aquifers, particularly that of the Quaternary aquifer is recognized. Significant negative impacts on groundwater quality have been assessed only for the construction phase, with the opening of trenches and the operations at construction camps being the most critical activities. Section 10.1.3 and 10.1.9 address specific mitigation measures for protecting groundwater resources, and section 10.1.5 on waste management, also provides for the groundwater protection. The impacts of the decommissioning of the obsolete Zaspa WWTP have been considered in sections 9.3.1.11 and 9.3.3.4. The negative impacts on the environment, particularly those derived from the presence of asbestos, have not been considered significant as long the strict safety measures established in EU Directives, which include groundwater protection, are applied. During the operational phase, the impacts on groundwater quality have been considered to be positive (sections 9.3.3.3 and 9.3.4.2). The extension of the sewerage network using tight building materials to avoid migration of sewage will eliminate the ground and groundwater contamination currently existing due to seepage from leaky holding tanks or emergency spillages. Also, the installation of a measuring and monitoring system for the Gdansk Water System (task 1) will allow to manage the groundwater use in such a way as to reduce pollution risks (section 9.3.4.2 and chapter 11). Finally, the sludge

KEY ISSUE	PART OF THE EIA WHERE KEY ISSUE IS ADDRESSED
	issue is addressed in section 5.10.6.1, where it is indicated that the better sludge management to be carried out after accomplishing the extension of the WWTP Wschod will reduce the risk of water contamination during floods.
Sliding risks (task 26, step V)	Stabiltiy problems derived from geomorphological changes due to the creation of artificial talus or banks in areas where buildings and other infrastructures are built in a steep slope of the terrain have been assessed in section 9.3.1.2 for tasks 10, 13, 16, 26 and 27. The geotechnical studies take into consideration the sliding risks for the engineering design of the structures to be built. Mitigation measures contributing to slope stabilization are described in sections 10.1.15 and 10.1.16. Monitoring of the sliding risks is established in chapter 11.
Affection to landscape (tasks 10, 16)	Impacts on landscape and visual amenity have been identified during both construction and operational phases, but have been assessed only for the operational phase because of the permanent presence of buildings, reservoirs, and talus (section 9.3.2.1). Specfic landscape protection measures are addtessed in section 10.1.16. In addition, a series of mitigation measures have been defined, which contribute to the preservation of the landscape, including top soil recovery and management measures (section 10.1.8), flora protection measures (section 10.1.10), protection of protected natural areas (section 10.1.12), reclamation of occupied land (section 10.1.14), and revegetation measures (section 10.1.15).
Affection to archaelogical sites (task 21, 27)	The rich historical background of the City of Gdánsk has been considered in assessing the impacts on cultural values, specially during construction activities, which could destroy buried archaeological remains. The impacts of all those tasks located in archaelogically protected areas, and areas of cultural, rural, urban, and industrial infrastructure heritage have been assessed in section 9.3.1.9. Measures aimed at the protection of cultural values are identified in section 10.1.13 and chapter 11.
Land occupation (task 22, 25)	The disturbance that the construction works cause to the neighbouring residents, both in urban and rural areas is addressed in section 9.3.1.11. it is considered land occupation of private property will be minimal and therefore, this impact has not been assessed as significant. In order to minimise these annoyances, the construction works plan will need to take into account these aspects.
General issues	
Noise during construction	The noise during construction works has also been taken into account in section 9.3.1.1. They are not considered significant either because of their short term and efficient offsetting with adequately implemented mitigation measures. Noise prevention measures for the operational phase are nonetheless identified in

KEY ISSUE	PART OF THE EIA WHERE KEY ISSUE IS ADDRESSED
	section 10.1.7. Also noise control measures are proposed in the Monitoring program described in chapter 11.
Dust emissions during construction	Impacts on air quality from construction activities involving machinery and vehicle combustion gas emissions (CO, NOx, HC), and dust emissions from earth movements are addressed in section 9.3.1.1. These have been considered short term affections, which can be minimized by putting into place good environmental practices, and therefore have been assessed non significant. Mitigation and control measures to minimize the air quality impacts are described in section 10.1.6 and chapter 11.
Damage to vegetation	The impact on vegetation is assessed in section 9.3.1.6 and considered to be compatible; 93,70% of the vegetation areas affected correspond to cultivated land and pastures and 6,30% to forested areas. Flora protection measures are defined in section 10.1.10.
Waste management	Waste management is addressed in section 10.1.5 as an specific issue to be given special attention during construction works.
Damage to Natura 2000 sites	Impacts on protected areas are assessed in section 9.3.18. None of the project's tasks is located in a Natura 2000 site, but task 23 has approximately 2,6 km of pipeline running along the boundary of Natura 2000 site PLB 220004 Ujscie Wisly. Although no land taken of this bird important area will take place, some nuisance to the fauna inhabiting this protected area is not discarded during construction works. Specific measures for protected natural areas are described in section 10.1.12. These are complementary to mitigation measures for flora and fauna defined in sections 10.1.10 and 10.1.11.
High groundwater levels	Section 9.3.3.5 addresses the effects of the groundwater level control and increased uptake of the planned groundwater abstraction system, which are expected to result in the stabilization of groundwater levels in some areas of the lower terrace of the city.

6. SCOPING PROCESS

A scoping study has been undertaken to establish the main features of the proposed Gdánsk water and wastewater projects to identify the main environmental sensitivities and constraints within the project area.

The following activities have been undertaken with regards to this study:

- Preparation of an overview of the legal and administrative context for environmental impact assessment and major public construction projects in Poland and EU.
- Review of the following documents provided by The Gdánsk Water and Wastewater Infrastructure Company to Eptisa:
    - Feasibility Study, Jacobs, January 2005.
    - Information on environmental influence of the project, Jacobs, April 2005.
    - Expert opinion on the environmental impact assessment undertaken by Jacobs by EkoKonsult, Gdansk, February 2005.
    - Application for Assistance for the Cohesion Fund 2000-2006. Annex I. Environmental Impact Assessment. The document provided includes the application as well as the attachments (Official Polish documents related to the process).
    - Applications for environmental decisions regarding affection to Natura 2000 Network Areas.
    - Responses from the Authority responsible for monitoring the Natura 2000 Network Areas.
- Preparation of a draft Public Consultation and Disclosure Plan (PCDP), including the organization of initial consultation activities to ensure the ensure identification of key environmental issues and local concerns about the project, which will be addressed in the environmental assessment.
- Organization of two meetings with Non Governmental Organizations and relevant authorities.
- Preparation and handling of a scoping report for consultation to relevant authorities.

6.1 SCOPING UNDER EU DIRECTIVES

EIA is a procedure is a procedure required under the terms of the European Union Directives 85/337/EEC and 97/11/EC on assessment of the effects of certain public and private projects on the environment.

Scoping is the process of determining the content and extent of the matters, which should be covered in the environmental information to be submitted to a competent authority for projects subject to EIA.

The scoping provisions of the Directives are contained in Article 5(2) of Directive 97/11/EC, which requires that "Member States shall take the necessary measures to ensure that, if the developer so requests before submitting an application for development consent, the competent authority shall give an opinion on the information to be supplied by the developer in accordance with paragraph 1. The competent authority shall consult the developer and authorities referred to in Article 6(1) before it gives its opinion. The fact that the authority has given an opinion under this paragraph shall not preclude it from subsequently requiring the developer to submit further information."

The authorities who must be consulted during scoping, in accordance with Article 6(1), are those "which are likely to be concerned by the project by reason of their specific environmental responsibilities". The Directive allows Member States to "…designate the authorities to be consulted, either in general terms or on a case-by-case basis."

Thus, scoping is not mandatory under Directive 97/11/EC, but all Member States, which do not have scoping in their EIA procedure are required to introduce, as a minimum, a voluntary scoping stage. The minimum requirement is that competent authorities must provide a Scoping Opinion if requested by a developer. The Scoping Opinion should identify the content and extent of the information to be elaborated and supplied by the developer to the competent authority.

Some Member States have made scoping mandatory as provided by the final part of Article 5(2) of the Directive. Two types of mandatory system have been adopted:

- Scoping is undertaken by the developer or the developer's EIA Team. A draft Scoping Report is prepared and circulated amongst consultees before it is finalised and issued as the agreed terms of reference for the EIA. The consultees may be just the environmental authorities or may include other interested parties and the general public.
- Scoping is undertaken by the competent authority or by an independent body such as an EIA Commission or a panel of EIA experts on behalf of the competent authority. The competent authority will then issue a Scoping Opinion to the developer, which forms the terms of reference for the EIA. Prior to finalising the Scoping Opinion, the competent authority will consult the environmental authorities and may consult other interested parties and the general public.

Scoping is an early stage in the process and is designed to ensure that the environmental studies provide all the relevant information on:

- the impacts of the project, in particular focusing on the most important impacts;
- the alternatives to the project;
- any other matters to be included.

Thus, to allow a competent authority to provide a Scoping Opinion, the developer will have to provide the competent authority with some information on the project. The guide provides a Checklist of Information Needed for Scoping, which can be used to identify the types of information which are likely to be needed. As much information as is possible at the time should always be provided. This may involve some preliminary data collection and field work.

The findings of scoping define the "scope" of the environmental information to be submitted to the competent authority and the terms of reference for the environmental studies to be undertaken to compile that information. A Scoping Report or Opinion should identify the content and extent of the information to be provided by the developer to the competent authority. In particular, Scoping Reports and Opinions will always identify the types of environmental impacts to be investigated and reported in the environmental information. They may also cover:

- alternatives which should be considered;
- baseline surveys and investigations which should be carried out;
- methods and criteria to be used for prediction and evaluation of effects;
- mitigation measures which should be considered;
- organisations to be consulted during the environmental studies;
- the structure, content and length of the environmental information (or EIS).

It is also important to note that although scoping can be considered as a discrete stage in the EIA process, which ends with issue of the terms of reference for the EIA, the activity of scoping should continue throughout, so that the scope of work can be amended in the light of new issues and new information. The scope of an EIA must be flexible enough to allow new issues which emerge during the course of the environmental studies, or as a result of design changes or through consultations, to be incorporated. It is important to remember that the Directive allows competent authorities to request additional information at a later stage in the EIA process, even if this information was not requested by them when they issued a formal Scoping Opinion.

For some particularly sensitive and confidential projects, or those for which wide consultation may result in a loss of competitive advantage, it may be necessary to restrict the range of consultations to the competent authority and the statutory environmental consultees. This will not be permissible in

EIA regimes where prior notification and scoping are mandatory stages in the EIA process and would not generally be considered to be good practice. However where it is an option, non-statutory organisations and other interested parties, including the public, should be invited to comment as early as possible in the later stages of the assessment.

With regards to whom should be consulted, the EU Commission guide suggests a Consultations Checklist, which identifies types of organisations which may usefully be consulted in EIA. It is not a comprehensive list and EIA teams should always consider what types of local or national organisations it might be appropriate to consult for a particular EIA.

With regards to the methods that can be used for scoping, there is a range of means of which one or more can be used, including:

- initial announcements about the scoping process in local or national newspapers;
- posting notices announcing the scoping process at the site, in the neighbouring area and at the offices of local authorities;
- preparing a leaflet or brochure about the project giving brief details of what is proposed with a plan or map, describing the EIA process and the purpose of scoping, and inviting comments;
- distributing letters or questionnaires to potentially interested organisations and nearby residents requesting information and comment on the proposals (this is often a good starting point for scoping if the number of interested people and organisations is large);
- telephone discussions or meetings with key organisations, groups or individuals;
- articles in newspapers, on radio or on television;
- public meetings (it may be helpful to invite an independent person to chair public meetings);
- public exhibitions (an exhibition may be preferable to a public meeting as people who are nervous about standing up and speaking at a public meeting may feel more comfortable speaking to someone on a one-to-one basis at an exhibition;
- meetings can also be dominated by a few vocal attendees and not allow the full range of issues or even the most important issues to be expressed);
- a Scoping Workshop at which participants work together through a structured programme to identify matters to be addressed by the EIA process (this can be particularly helpful if the issues are complex and there are several groups interested in the proposals; an independent facilitator can be useful in ensuring workshops are successful);

- establishing an expert or community based Scoping Group who will continue to oversee the environmental studies throughout the process (this can be useful for projects where the issues are complex or where the project is at an early stage in the planning process and the significance of issues is unclear);
- publishing a draft Scoping Report for review and comment before completing the process.

In most EIAs a range of different approaches can be used to suit the different types of organisations and individuals involved and the degree of interest in the project.

An effective consultation process in scoping typically will follow a number of steps.

1. Identify a list of organisations and individuals who are interested in the project and update this as the project develops.
2. Contact each consultee to request their help in scoping.
3. Send them information about the project in the form of an attractive leaflet or brochure. Give contact details for information and comment.
4. Make the leaflet widely available in local centres (libraries, town halls, post offices); possibly provide a copy to every household and business in the area.
5. Collate and analyse all responses and take them into account in planning the environmental studies.
6. Write back to each respondent thanking them for their help and explaining how their comments have been addressed.
7. If appropriate arrange to telephone or meet them in person to discuss the issues they raise.
8. If there is considerable local interest consider holding a public exhibition (in a hall or a mobile caravan) or a community meeting at which the project will be presented and staff will be on hand to answer questions.
9. If there are several groups with a common interest consider setting up a special forum for them to meet you at intervals
10. If the EIA process is lengthy issue a regular newsletter to keep consultees up to date with what is happening.
11. Always record the views expressed in consultations in the EIS.

All participants in scoping should be invited to comment on the project design, on its potential environmental impacts and their mitigation, and on any alternatives which they consider should be

investigated. Consultees are also an invaluable source of local knowledge and it is useful to ask them about any information they have on the local area, and on any special local issues.

Whichever method of consultation is employed it is important to:

- provide enough information about the project for consultees to understand what is proposed and identify potential issues;
- make clear to participants that the scoping process is about hearing and understanding their views not about selling the project;
- provide sufficient time for consultees to respond to requests for views and information;
- reassure consultees that any views which they express at the scoping stage will not preclude them from making further comments and possibly objecting at a later stage in the EIA process;
- ensure that the views expressed are taken into account, and are seen to be taken into account, in planning the environmental studies and preparing the EIS, and that an explanation is provided if recommendations are not followed.

An effective way of ensuring participants understand how their views have been addressed is to summarise the results of the scoping process in the EIS.

6.2 THE SCOPING PROCESS IN POLAND

The environmental assessment process in Poland is regulated by the Environmental Protection Law Act of 27 April, 2001 (Official Journal No.62, item 627 with amendments), and the Act of 18 May, 2005 on changes in The Environmental Protection Law and other acts (Official Journal, No 113, item 954).

As indicated for the screening process, the environmental consent procedure differs depending on whether a particular project is included in group I, II or III. The EIA report should be submitted along with the application in the case of group I projects. For group II and III projects, basic information on the project must be attached to the application, so as to carry out the screening stage, at the end of which an interim decision is given on either the obligation of preparing the EIA report or the exemption for preparing it. If the relevant body states that the EIA report is required, it must also specify the **scope** of the report.

For group I projects, the applicant has the right to request the body issuing a particular decision to specify the **scope** of the report. Such a request is to be done before submitting the application. Information on the proposed project must be attached to the request as specified in Article 49 (3) of the EPL Act.

When specifying the scope of the report, the body responsible for the scoping should consider all the requirements defined in Article 52 (1,2,6) of the EPL Act.

Article 52 (1) of the EPL Act establishes the content of the EIA report. In establishing the scope of the EIA, the body responsible for scoping should specify the extent to which particular components should be analysed. It may also specify methods for conducting the analysis or alternative solutions that should be considered. This allows for submitting an EIA report that describes some of the issues briefly and others in a more general way.

The EPL Act does not provide for a separate scoping stage before granting a building consent, a permit for deconstruction of a built site or a permit for changing the use of a built site. The scope of the report should be the same at this stage as at the stage of issuing the decision on conditions for land development and use for the same project. The report, however, should also meet the requirements specified in Article 52 (4) of the EPL Act.

The following steps are followed in the scoping process:

Step 1: Identification of potential impacts

The first step is to identify project's potential impacts on environment. This is accomplished by analysing the relation between the project and environment during project's implementation, operation and liquidation stages.

Step 2: Review of alternative solutions

According to Article 49 (3) (4) of the Act, data on alternative solutions should be attached to the application for specifying the scope of the EIA report for the body responsible for the scoping to review all the alternative solutions included in the application and identify other solutions that can reduce project's impact. A supplementary register No.2 is available to help in identifying solutions that the body considers important and that the applicant should include in the EIA report.

Step 3: Consultations

The following bodies are competent to issue an opinion on the scope of the EIA report:

- A relevant *voivode*, with regard to group I projects, which always require the EIA report , and for projects that are likely to have a significant impact on Natura 2000 sites
- A *starost*, with regard to group II projects, which may require the EIA report .
- A *powiat* (local) sanitary inspector with regard to group II projects and a voivod (regional) sanitary inspector with regard to group I projects
- Director of the Maritime Office with regard to projects located on Natura 2000 sites on Baltic Sea.

The EPL Act does not specify the procedure for issuing opinions. The general rules of the CAP are, however, applied here. According to Article 106 of the CAP, if the law requires that issuing a particular decision depends on the position of a relevant body (e.g. issuing an opinion), the decision is granted only when the body specifies its position. The opinion is issued as an interim decision and the applicant may file a complaint against it. Similarly, as in the screening stage, opinions are not binding.

Moreover, according to Article 396 of the EPL Act, a *voivode* may ask the *Voivodship* Environmental Impact Assessment Commission to issue an opinion regarding the case that falls within the scope of the authority of the *voivode*. Similarly, a *starost* may submit an application to the *voivode* to ask the *Voivodship* Commission to issue an opinion regarding the case that, according to the Act, falls within the scope of authority of the *staros*t.

According to Article 395 (4) of the EPL Act, a *voivode* may submit an application to the minister responsible for environmental protection to ask the State Environmental Impact Assessment Commission, to issue an opinion regarding the case that falls within the scope of authority of the *voivode*.

Step 4: Identifying the most significant impacts

Steps 1,2, and 3 should result in preparing a register of all potential impacts that a particular project may have on environment. The aim of step 4 is to reassure that preparation of the report is focused on gathering information necessary for granting a particular decision.

Step 5: Interim decision on the scope of the EIA report

The last step of the scoping stage is to issue the interim decision on the scope of the EIA report, along with its justification, and to inform the applicant and other parties in the procedure about the decision. The interim decision should include all the significant impacts that have been identified as well as alternative solutions that should be considered.

6.3 SCOPING OF THE PROJECT

Scoping results obtained are presented below:

1. Scoping information extracted from the administrative decision process

The administrative information regarding the administrative decisions process for each task of the project has been reviewed in order to extract the relevant scope issues for this EIA. The results are presented in the following table.

No	Task	Scope issues
Projects out of Annexes I or II		
1.	Building of a measuring and monitoring for the Gdańsk Water System	These projects are out of Annexes I or II. The investment has not been found to carry out any potential impact on the Natura 2000 areas because of the substantial distance between the project site and the closest Natura areas, and because of the nature of the projects.
7.	Treatment of water from Pręgowo water intake (building a water treatment station in Pręgowo)	
9.	Extension of water treatment station Zaspa Wodna	
13.	Recommisioning of Stara Dolina water reservoir	
15.	Reconstruction of water pumping station Ptasia	
Projects in Annex II for which an EIA has not been required		
2.	Building of Kiełpino water reservoir along with rebuilding of Migowo pumping station and building of water mains to connect Kiełpino water reservoir with the central Gdańsk water supply system.	**General issues:** Eventual marginal environmental influence at the stage of project construction, with contribution to noise and dust emissions from construction machineries, transportation machineries, earth works. The project has not been found to carry out any potential impact on the Natura 2000 areas because of the substantial distance between the project site and the closest Natura areas. Protection measures: Avoidance of collisions with trees, protection of trees during building works Reduction of land use during works Temporary organization of waste gathering For wastewater projects, use tight building materials to avoid migration of sewage. Carry out a trees survey together with a plan of vegetation management. **Specific key issues**: Task 2. In the neighbourhood of Kielpino reservoir location there is the Otomanski landscape protected area. It has been considered the project will not have a negative influence on this area. Tasks 6, 8, 11, 12, 14, 24, 25. The project area has not environmental protected areas or high landscape, historical or cultural values. There are green areas of limited importance. Task 11. For assessment of most effective conditions for placing new infrastructure, necessary ground and water research as well as a green inventory will be carry out before design works. Task 16. The project area has not environmental protected areas or high landscape, historical or cultural values. There is an environmental-landscape area Dolina Potuku Orunskiego in the close neighbourhood. It has been considered there is no basis for assuming the project will have any negative impact on this protected area. During operation, a risk may
3.	Building of water treatment station Osowa complete with water reservoir Osowa	
4.	Building of water main connecting Gdańsk-Osowa with the central Gdańsk water supply system	
6.	Building of water main supplying Orunia-Olszynka area from Lipce water intake	
8.	Building of water main for Gdańsk-Południe district	
11.	Water supply to Kokoszki-Bysewo area (building of water supply network in the area of Kokoszki – Bysewo)	
12.	Building of water pipeline in Żuławy – area of Olszynka	
14.	Building of water intake and water treatment plant Zakoniczyn	
16.	Building of new pumping station in the area of Orunia reservoirs, plus building of two water reservoirs	

No	Task	Scope issues
17.	Building a water supply network and new pumping station for lowland area – pumping station Sobieski	any negative impact on this protected area. During operation, a risk may be the necessity to discharge stock water on an emergency. Task 19. The project area has not environmental protected areas or high landscape, historical or cultural values. The route of the sewer is close to Trojmiejski Landscape Park, but no negative impact is expected on this protected area. Along Nowych Spardochroniarzy street reduce the cut out of trees, makrolevelling, and risk of erosional processes. Task 21. The project area has not high natural or landscape values. However, some part of the sewage route crosses an archaeological protection zone. All soil works in this area should be preceded by archeological investigation. Task 23. The project location assures lowest level of interference and disturbing of private ownership. Environmental protecting solutions will be applied, i.e.: protection of core system of existing stand near by excavation. Task 25. Change in the way of land use will occur only in case of construction of necessary sewage pumping stations. The areas for pumping stations will be gained from land owners. Task 27. The project area has not environmental protected areas or high landscape values. The Channel of Radunia river, registered as historical monument, is located in the project area, as well as the suburban rural complex of Sw, Wojciech, protected by Voivodship Cultural Heritage Conservator. A part of the protected area is under archaeological observation. All works in protected areas shall be agreed and conducted under the supervision of competent authorities.
19.	Sewage system for Osowa-Barniewice-Klukowo	
20.	Sewage and storm water system for Zabornia district	
21.	Sewage system for Jasień-Wieś	
22.	Sewage system for Łostowice district	
23.	Sewage system for Sobieszewska Island	
24.	Building a sewage system for Gdańsk – Orunia	
25.	Building a sewage system for Olszynka district	
27.	Sewage systems for Święty Wojciech and Lipce districts and the areas adjacent to Trakt Św. Wojciecha Street	
Projects in Annex II for which an EIA has been required		
10.	Rebuilding of water intake and water treatment station Dolina Radości	Decision to have an EIA study performed for this project based on its location within Tri-city Landscape Park and close to the designated nature conservation reservoir "Meadows in Dolina Radosci" **Specific protection measures**: Eliminate impacts on landscape. Buildings should match the landscape. Reduce scale of building site. Perform building works out of vegetation season, Water intake should not exceed 300 m^3/h Hydrological investigations should consider existing sink depression (proposal to eliminate drill well No 13c and 2a).
18.	Extension of Wastewater Treatment Plant Gdańsk-Wschód-step III-connection of Wastewater Treatment Plant Zaspa discharge area	Decisions to have an EIA study performed based on the size of the project - it consists of three sub-tasks, including WWTP liquidation and connection with modern WWTP "Gdansk-Wschod" -, the need to provide works within the city center, this is in a densely populated area, and high groundwater levels.
26.	Building a sewage system for Kiełpino Górne district	For step V: Decision to have an EIA study performed for step V of this project based on the existence of topographic features that may pose sliding risks. **Specific prevention measures**: Methods for preventing earth sliding should be analyzed. For step IV: The project area has not environmental protected areas or high landscape, historical or cultural values. Otominski Area of Protected Landscape is close to the project site, but no negative impact on this protected area is expected.

No	Task	Scope issues
		Eventual marginal environmental influence at the stage of project construction, with contribution to noise and dust emissions from construction machineries, transportation machineries, earth works. The project has not been found to carry out any potential impact on the Natura 2000 areas because of the substantial distance between the project site and the closest Natura areas.
Projects in Annex I		
5.	Rebuilding of Lipce water intake and water treatment plant	This project is included in Annex I. A location decision of a public project has been issued for this project. No scoping EIA scoping conditions were established for the EIA from either the Pomorski Voivod, the Department of Environment and Agriculture of the Pomorskie Voivodship or the Marshal of the Pomorskie Voivodship to whom consultations were made. No scoping needs to be done under Polish for Annex I projects, unless requested by the developer.
28.	Extension of Wastewater Treatment Plant Gdańsk Wschód – step II b – sludge management, adjustment to stricter nitrogen removal requirements	This project is included in Annex I. A location decision of a public project has been issued for this project. No scoping EIA scoping conditions were established for the EIA from either the Pomorski Voivod, or the State Vovoidship Sanitary Inspector to whom consultations were made. No scoping needs to be done under Polish for Annex I projects, unless requested by the developer. **Protection measures that have been specified for this project by the sponsor in the application for environmental decisions regarding affection to Natura 2000 Network Areas:** Sludge drying facilities will be equipped with closed air circulation system and air emission treatment. Dry sludge stored in silos and transported in cistern trucks. The area of interim storage will be enclosed in 4 m height concrete walls and roofed. Electrical engines will be provided with silencers. Building facilities will be acoustically insulated.

2. Scoping information extracted from previous public consultation and disclosure, and meetings with Non Governmental Organizations and relevant authorities.

As indicated in the Public Consultation and Disclosure Plan, exhibited in chapter 5, the previous public consultation and disclosure done by the developer for raising public awareness about the issues of the water quality, water supply, and wastewater management, and receiving opinions, which may influence the Project's scope, was reviewed. Also, two public hearings, on 07 October 2005 and 16 November 2005, and a consultation to relevant authorities were carried out during the preparation of the EIA study as part of the scoping process.

The key issues identified during the public participation processes mainly concern aspects associated to subprojects 10, 16, 18 and 28.

Serious public concern has been detected on groundwater issues, both regarding the availability of water resources as their vulnerability. Specific issues were raised regarding Czarny Dwór, Zaspa and Dolina Radości water intakes.

For the Czarny Dwór water intake, concern is mainly on contamination threats from the construction of a new hypermarket in the groundwater protection zone and from the road system in the area, which is not supported by the rain water collection system. In connection with the project itself, the fear of a potential contamination related with the change of the sewers associated to the closure of the Zaspa WWTP has been expressed. Also, the potential affection to this water intake, as well as that of Zaspa, during the demolition of the Zaspa WWTP, has been emphasized.

For the water intake at Dolina Radości (task 10), the main concern has been expressed on ensuring compliance with the maximum level of water abstraction allowed in the water supply consent of 2 December 2003.

Significant concern has also been observed for the problem of groundwater raising levels in the lower terrace of Gdánsk, which causes flooding in some areas of the city, with the water entering the cellars, i.e. in Orunia district. Even though, scientists appear to attribute this trend to natural conditions, the citizens demand additional studies.

Landscape and nature conservation are as well issues of concern among the inhabitants of Gdánsk. In particular, the rebuilding of the water intake and water treatment station Dolina Radości (task 10), and the building of the new pumping station and the water reservoirs in the area of Orunia (task 16).

For the Dolina Radości site, requests have been made for a maximum use of the existing infrastructure and renouncing to planned new buildings so as to minimize nature destruction.

As for the works to be implemented in the area of Orunia, the citizens fear the negative impact the new water reservoirs will have on the values of the Oliwski Stream Valley and the Orunia Park.

The possibility of closing the surface water intake from Straszyn is an issue that also matters the inhabitants of Gdansk, who would like this source of water decommissioned.

The need for preventing the affection of any protected areas, especially Natura 2000 sites, has been stated by the authorities consulted.

Finally, concern about the utilization of the sewage sludge of the "Wschód" wastewater treatment plant (task 28) has also been expressed. Solutions contributing to the best and the most secure utilization of the sewage sludge, have been requested.

The conflict between the inhabitants of the Sobieszewska Island and the municipality with regards to the fees the municipality wants to impose, and to which the inhabitants of the Sobieszewska Island are opposed, is also an important issue, although not strictly an environmental one.

3. Summary of key issues on the scope of the EIA

The scoping issues to be considered in the EIA are summarised herein.

No scoping issues were raised by the consulted authorities for tasks 05 and 28, included in Annex I, this being in compliance with Polish regulations, which do not require the authorities to provide a scoping unless this is requested by the developer.

For task 28, however, the developer has established environmental protection measures that are to be implemented with the project, namely:

- Sludge drying facilities will be equipped with closed air circulation system and air emission treatment.
- Dry sludge stored in silos and transported in cistern trucks. The area of interim storage will be enclosed in 4 m height concrete walls and roofed.
- Electrical engines will be provided with silencers.
- Building facilities will be acoustically insulated.

In addition, citizens have raised the concern about the utilization of the sewage sludge for reclamation of phosphate waste heap, which is a source of ground and water pollution added to that of the sewage sludge, and urge to adopt solutions that will contribute to the best and the most secure utilization of the sewage sludge.

No scoping issues have been raised either for tasks 01, 07, 09, 13 and 15, not included in either Annex I or II.

For tasks 10, 18, 26, included in Annex II, an EIA was required by the authorities. The following scoping issues were raised:

Task 10: mitigation measures requested for this project include minimization of landscape impacts, construction of buildings matching the landscape, reducing scale of building site, and avoiding vegetation season, water intake limited to 300 m^3/h, performing hydrological investigations on existing sink depression.

Task 18: Concern on the size of the project, the need to provide works within the city center, and presence of high groundwater levels were identified.

Task 26: The EIA was required for step V, due to the existence of topographic features that may pose sliding risks was emphasized and therefore, it was established the need to perform analyses for preventing earth sliding. For step IV, no major environmental issues were observed. An eventual marginal environmental influence at the stage of project construction, with contribution to noise and dust emissions from construction machineries, transportation machineries, earth works, was identified.

For the rest of the tasks of Annex II, no EIA was required. However, general environmental issues have been addressed for all of these projects, that are applicable to all the tasks of the project. These general issues include:

- Contribution to noise and dust emissions from construction machineries, transportation machineries, and earth works during the construction phase;
- No potential impacts on the Natura 2000 areas are likely to occur because of the substantial distance between the project site and the closest Natura areas. Nonetheless, care should be taken for avoiding any potential damage;
- Implementation of protection measures for vegetation during construction works;
- Reduction of land use during construction works;
- Implement secure waste management;
- Use tight-proof building materials to avoid migration of sewage;
- Perform a tree survey before the start of construction works and implement a vegetation management plan.

Specific environmental issues have been identified for some of the tasks. The most relevant are:

Task 11. Assessment of most effective conditions for placing new infrastructure. Need of ground and water research as well as a green inventory before design works.

Task 16. It has been considered there is no basis for assuming the project will have any negative impact on the environmental-landscape area of Dolina Potuku Orunskiego. However, citizens are concerned that the infrastructure to be built in this site will destroy or endanger the park. During operation, a risk may be the necessity to discharge stock water on an emergency.

Task 21. Some part of the sewage route crosses an archaeological protection zone. All soil works in this area should be preceded by archeological investigation.

Task 22. The project location assures lowest level of interference and disturbing of private ownership. Environmental protecting solutions will be applied, i.e.: signalling of emergency state of pumping stations with telemetric data flow, protection of core system of existing stand near by excavation, reclamation to primary state of drainage channel, reconstruction of meadow lands (removal of pollution, stones, settlement of surface, meadow grass sowing) and agricultural (building in the land put aside).

Task 25. GIKW owns the areas for pumping stations.

Task 27. The Channel of Radunia river, registered as historical monument, is located in the project area, as well as the suburban rural complex of Sw, Wojciech, protected by Voivodship Cultural Heritage Conservator. A part of the protected area is under archaeological observation. All works in protected areas shall be agreed and conducted under the supervision of competent authorities.

In addition, in the context of this project and the public information that has been carried out as part of the scoping process, citizens have raised concern about the problem of groundwater raising levels in the lower terrace of Gdansk, which causes flooding in some areas of the city. Concern has also been raised about the potential pollution of the Czarny Dwór and Zaspa water intakes, due to the demolition of the WWTP Zaspa and the associated change of serwers.

7. DEVELOPMENT OF PROJECT AND ALTERNATIVES

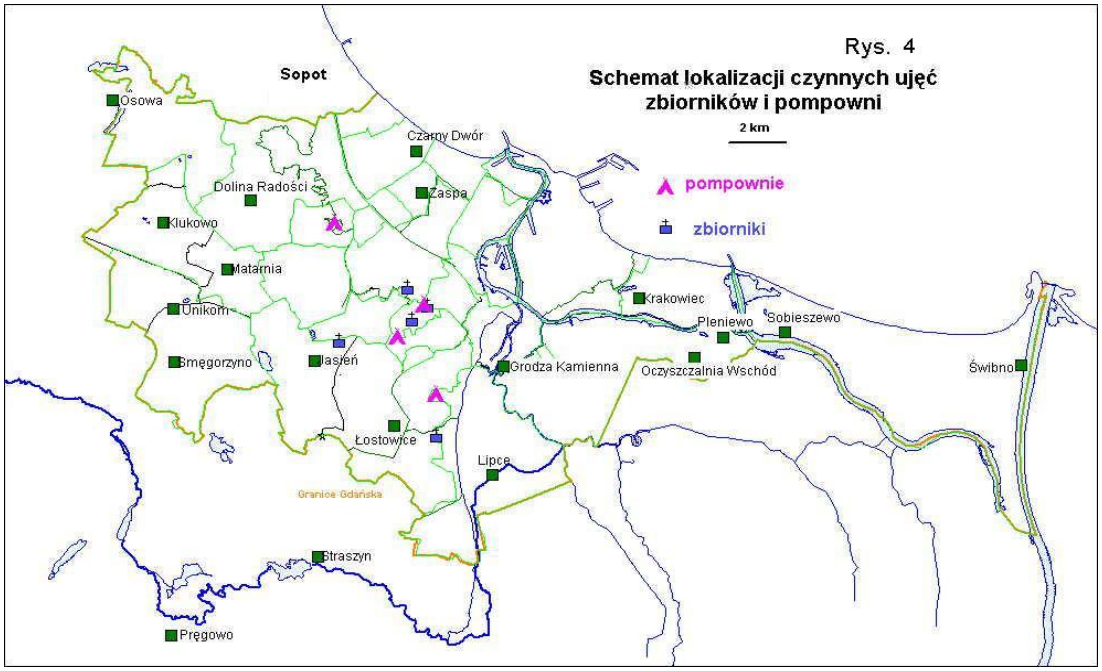
7.1 CURRENT SITUATION

7.1.1 Water Supply

The City of Gdansk is supplied with water from underground water intakes and the surface intake "Straszyn". Water production is sufficient to cover the consumers' needs. Deficiencies refer to drinking water quality, not meeting the required Polish and EU standards.

The sources are as follows:

- 17 underground water (5 in central system [1 spring water intake], 10 local water intakes, 2 reserve water intakes)
- 1 surface water intake (Straszyn)
- Local water intake operated by UNIKOM Company
- Water purchased from 2 water intakes in Sopot



Key to illustration:

Pompownie – pumping stations

Zbiorbniki - reservoirs

The water supply system has also the following deficiencies:

- Reduced abstraction in recent years from groundwater stations in lowland areas contributes to local flooding problems.
- The distribution system is oversized and leads to deterioration of water quality in the system (particularly from the Straszyn surface water intake).
- Supplies in developing areas on higher ground are generally not connected to the central distribution system and the supplies are not as secure as desired.
- The surface water treatment plant has high operating costs, and maintenance of the large protection zone for the surface water intake is expensive and problematic.
- Residents do not like the taste of water supplied from surface water station Straszyn.

Activities required to remedy deficiencies in the existing water supply system have been analysed and found out to be as follows:

- Connection of local supply systems to the central system, and the creation of a ring main to improve security of supplies.
- Provision of new water treatment stations and/or rehabilitation of existing stations to ensure that all water supplies meet the EU and Polish standards.
- Change sources of supply and/or replacement of oversized distribution mains to overcome taste problems.

7.1.2 Wastewater Management

Wastewater collection, in particular city districts and neighbouring municipalities served by the system, is developed to different levels. However, overall, the sewerage network covers approximately 95% of the inhabitants of Gdansk and the neighbouring municipalities that are served. The inhabitants of unsewered areas of the City, in particular in the quarters of Osowa-Braniewo-Klukowo, Zabornia, Jasień, Łostowice, Orunia, Olszynka, Kiełpino Górne, Święty Wojciech, and Sobieszowska Island, face the nuisance caused by operation of septic tanks and sewage collection points as well as with lack of rain water drainage systems that causes flooding of lots and cellars, and difficulty in transportation.

Sewage from Gdańsk and neighbouring towns is treated in two biological sewage treatment plants as follows

- Wastewater Treatment Plant (WWTP) "Gdańsk-Wschód"
- Wastewater Treatment plant "Zaspa"

Gdansk – Wschód WWTP complies with all Polish and EU regulations regarding waste water treatment except for total nitrogen, which average 11.9 mg/l compared to the required standard of 10 mg/l.

Zaspa WWTP, which was built in 1932, is not adapted for removal of nutrients and therefore cannot meet the required standards for nitrogen and phosphorus

The deficiencies of the existing treatment plants may be summarised as follows:

Zaspa WWTP

- The plant fails to meet current regulations for total N and P effluent concentrations.
- The design of the treatment plant does not permit the introduction of a biological nutrient removal process.
- The plant is located close to large population centres and there are many complaints.

Gdansk-Wschod WWTP

- Removal of total N does not meet EU or new Polish regulations.
- The quantity of biogas produced in sludge digestion is lower than expected.
- The use of biogas generated in digestion is not effective since a substantial proportion is burnt in the flare.
- Low efficiency of primary treatment.

Activities required to remedy deficiencies in the sewage network are as follows:

Implementation of complete sewerage system coverage requires the construction of 70 km of gravity sewers, 6 km of pressure pipes, and 25 pumping stations in a total of 9 areas.

Activities required to remedy deficiencies regarding existing WWTP are as follows:

- Closure of Zaspa WWTP
- Modernisation of Gdansk-Wschod WWTP to improve nitrogen removal

Steps have already been taken towards the closure of Zaspa WWTP and the following measures are necessary to complete the process:

- Transfer of the Zaspa WWTP catchment flows to Olowianka PS
- Construction of 2nd pressure main from Olowianka PS to Wschod WWTP.
- Demolition of the decommissioned structures at Zaspa WWTP.

The modernisation of Gdansk-Wschod WWTP to improve nitrogen removal requires some or all of the following measures:

- New screens and aerated grit and grease removal chambers.

- Rehabilitation of hydrolizers and provision of new mixers.
- Repairs to primary settlement tanks and replacement of scrapers.
- Conversion of existing bioreactors from UCT process to 3 stage Bardenpho.
- Provision of methanol dosing system.
- Reconstruction of secondary tank scum removal system.
- Possible separate treatment of high ammoniacal nitrogen sludge liquors.
- Miscellaneous other works including, reconstruction of existing open digestion tanks, treated effluent wash water system, washing installation for contaminated sand collected from gullies, and electricity distribution extensions.

7.1.3 Sludge Management

Gdańsk-Wschód WWTP produces approximately 9.000 tons of dry sludge solids. A sludge centrifuge installation is currently in place which achieves dry solids content in dewatered sludge of 22% and, on this basis, approximately 41.000 tons of dewatered sludge would be produced. Until May 2004, the dewatered sludge was used for land reclamation and cultivation of plant species that are not designed for consumption or production of feeds. Storage of dewatered sludge takes place at the former drying beds.

The long term viability of the present sludge disposal method is not assured due to uncertainty over sustainability and future regulations.

The following measures have been considered to develop a sustainable long term sludge management system for Gdansk-Wschod WWTP:

- Possible thermal drying of sludge.
- Improvement of sludge storage facilities on site.
- Possible improvement of biogas generation.

7.2 ALTERNATIVES CONSIDERED

7.2.1 Water Supply

Six options for the sources of water supplies and development of the distribution system were considered.

Option I Operation of ground and surface water intakes generally as now (some local stations decommissioned), industrial intakes operated as now.

Option II-A Surface water intake Straszyn decommissioned, central system groundwater intakes operated at maximum capacity, water purchased from Sopot, industrial intakes operated as now.

Option II-B Like II-A but no purchase of water from Sopot, new water intake and treatment station Zakoniczyn constructed.

Option III Surface water intake Straszyn operated near maximum capacity, some central system ground water intakes operated to make up balance, industrial intakes operated as now.

Option IV Like to Option III, but shoreline groundwater intakes decommissioned and inland groundwater intakes operated at maximum capacity.

Option V Only large groundwater stations operated together with surface water system, industrial intakes operated as now.

Option VI Existing local groundwater intakes for industry decommissioned, industry supplied from surface water intake (the costs were found to be very high and this option was not been considered further).

7.2.2 Wastewater Management

Sewage network

The nine networks listed below were analysed:

- Osowa-Barniewice-Klukowo
- Zabornia Quarter
- Jasien-Wies
- Lostowice
- Sobieszewska Island
- Orunia
- Olszynka
- Kielpino Gorne
- Swiety Wojciech Quarter

Extension of Gdańsk – Wschód WWTP – phase III – connection of Zaspa WWTP drainage basin (closure of WWTP Zaspa)

The options that were examined are summarised below:

Task name		Examined options	
		Option I	**Option II**
Task1	Sec. A	Utilization of existing gravity sewers by loose relining	Construction of new pipes in an open trench system
	Sec. B		Construction of new pipes using microtunneling method
	Sec. C	Utilization of existing gravity sewers using "insituform" method	
Task 2		Crossing located above canal Na Stępce	Crossing under bottom of canal Na Stępce
Task 3		Liquidation of objects down to 1,5 m below ground level	Total liquidation of objects

Analysis of these options has shown that, in all cases, Option I is the preferred solution.

Extension of WWTP Wschod (phase IIb) to improve nutrient removal

The options presented for the modernisation of Gdansk Wschod WWTP are not really options but rather a comparison of the cost of the full programme of measures and the reduced cost of a programme to achieve the main objectives. The difference in investment costs is substantial with the full programme estimated to cost PLN 31.027.000 while the reduced programme costs PLN 18.527.200. The item deleted from the reduced option is the separate treatment plant (SHARON) for high strength sludge liquors at an estimated PLN 12.500.000. The inclusion of this separate plant would only be necessary if there was a shortage of treatment capacity, but the Wschod plant actually has surplus capacity.

7.2.3 Sludge Management

Three basic sludge management options were considered as follows;

Option I Disposal of dewatered sludge plus electricity generation from biogas.

Option II Thermal drying of sludge to form a granulate but no electricity generation from biogas.

Option III Thermal drying of sludge to form a granulate plus electricity generation from biogas.

A further variation that could be included with the above Options is the improvement of biogas generation by the use of a sludge disintegration method. Economic analyses of the three main options with and without biogas generation improvement were carried out.

The results of the analyses showed:

Option I (the present disposal system) was, in all cases, the most favourable economic solution. Clearly, this disposal method should be maintained as long as it is feasible, however, as explained, there are doubts as to the long term sustainability of this Option.

Option III (with sludge disintegration to improve biogas generation) was considered the next most favourable economic solution provided that the improvement in biogas generation is more than 15%. It was therefore recommended that there should be a requirement, for any biogas generation improvement project, to produce an increase of at least 25%.

Should the price of electricity rise in real terms, the choice of Option III with biogas generation improvement as the long term solution, becomes clear cut.

7.3 RECOMMENDED SOLUTIONS

7.3.1 Water Management

The main goal is provision of healthy fresh water to residents of Gdańsk, meeting quality standards stipulated by Polish and EU regulations. The recommended solution was Option II-B. The construction of Zakoniczyn water station provides additional water resources while the purchase of water from Sopot (as in option II-A) is still available. Implementation of this solution requires some reconstruction of the municipal water supply network, and a number of expensive investments.

Pending elaboration of projection of possible growth of demand for industrial water, and pending implementation of recommendations concerning rationalization of use of the underground water resources, early closure of water intakes or any water-supply system facilities is not advisable. The closure of the Straszyn intake will only be possible when all tasks included into Cohesion Fund application have been completed. However, in the financial analysis of this project it has been assumed that final closure of Straszyn intake will take place until the end 2012.

7.3.2 Wastewater Management

Analysis of the three tasks for the closure of wastewater treatment plant Zaspa shows that, in all cases, Option I is the preferred option.

The review of the modernisation programme Gdansk Wschod WWTP indicates that the reduced scope of Option II is the most appropriate to implement.

7.3.3 Sludge Management

Option III (sludge drying to form a granulate with the use of heat from the refinery for sludge drying and energy production from biogas) is the recommended long term solution. Despite the highest investment costs, it has low operating costs and assures long term sludge utilization. The attractive Option I, due to low investment and operating costs, cannot be recommended as the long term

solution due to uncertainty over sustainability of the disposal method and, in particular, the effect of future regulation on natural disposal of sludge.

It is also recommended that the project for improvement of biogas generation is included provided that trials demonstrate that an improvement of 25% in gas production can be achieved.

7.3.4 Conclusions

After carrying out financial analyses and considering affordability, it has been agreed the scope of the Cohesion Fund project should include:

- The seventeen water supply treatment and distribution projects described above,
- The nine sewerage network projects described above,
- The three projects (referring to six objects) related to the extension of Gdańsk – Wschód WWTP – phase III – connection of Zaspa WWTP drainage basin (closure of WWTP Zaspa),
- The projects related to the extension of WWTP Wschod to enable it to meet the required total N effluent standard,
- The measures designed to improve biogas production in the digestion process together with the combined heat and power plant to achieve 100% utilisation of the biogas,
- The sludge management measures at WWTP Wschod, including thermal drying of sludge, and
- Other works at WWTP Wschod including modernisation of existing open digestion tanks, treated effluent washwater system, washing facilities for contaminated sludge from gullies, extension of electricity distribution system, and testing of sludge disintegration methods.

7.4 DESCRIPTION OF THE PROJECT

The City of Gdańsk intends to improve the economic efficiency of the institutional setting of the water and wastewater systems. Hence, it has established an asset holding company, known as "Gdanska Infrastruktura Wodociągowo Kanalizacyjna" Sp. z o.o. – GIWK, which took over the Project for its implementation.

The main objective of Gdańsk Water and Wastewater Project is to eliminate the gaps in existing water supply and wastewater systems, and in particular:

- Supply of drinking water to the inhabitants of Gdansk, of quality compliant with Polish and EU regulations.
- Improvement of wastewater management in order to reduce the load of pollutants discharged into the Baltic Sea to ensure the ecological restoration of the Baltic Sea and preservation of its ecological balance.

- Development of a sustainable, economic and environmentally acceptable long-term sludge management system.
- Connection of nearly all water intakes to the main distribution system to improve security of supplies and flexibility of operation.
- Extension of the sewerage network to areas of Gdansk that are not connected at present.

All the above goals are in full accordance with national, regional, and local strategies. Project implementation will guarantee the compliance with all Polish regulations, and EU requirements and it will contribute to the fulfillment of obligations of the Republic of Poland resulting from Helsinki Convention.

The following tasks have been projected to achieve the above goals:

7.4.1 Water Supply

1. *Construction of a metering and monitoring system for the Gdańsk Water Supply System*.

   Installation of measuring instruments at the existing water intakes and in the water supply network. This involves the installation of metering equipment on existing pipelines, i.e. instruments for metering of water flow and water pressure, and equipment designed for water quality control at water intakes and in the water supply network. Two control systems will be provided: primary (hierarchical) control system for operating coordination of the water supply system objects that are connected to the system, and the secondary control system for control of individual objects.

2. *Construction of Kiełpino water reservoir*

   This will be combined with rebuilding of the Migowo pumping station and construction of water mains to connect the Kiełpino water reservoir with the central Gdańsk water supply system. The purpose of this project will be: Supply of water to the Jasień-Szadółki area located at datum levels of in excess of 110 m a.s.l and guaranteeing of required volumes of water during periods of maximum consumption for consumers who are currently supplied from local water intakes Smęgorzyno and Matarnia.

   This task includes:

- Construction of water storage reservoir, capacity 5.000 m^3, height 5m.
- Modernization of existing water pumping station Migowo (reconstruction and development of existing station).

Construction of DN 400 water main connecting Kiełpino reservoir and Migowo reservoir. Water main route from Kielpino reservoir along Stężycka Street, with crossing under ring road of Gdynia-Sopot-Gdank Obwodntca Trojmiasta Conurbation, then along Zródlana Street, crossing of Kartuska Street, along Zwierzyniecka Street to its connection to existing DN 600 water main.

This project will be implemented in the planned borders of Stężycka, Źródlana and Zwierzyniecka streets, outside the roadway of these streets.

3. *Construction of water treatment station Osowa*

This task will be also completed with water reservoir Osowa on the same land plot, including access road and technical infrastructure. This project consists of the reconstruction of the sanitary sewerage system and sewage pumping station for collection of backwashings from the filter plant and for the reservoir drainage system. Construction of an extra water storage reservoir (equalizing water outflow) for collection of emergency spills from treated water reservoir will also be required. No legal avenue remains open for discharge of the process waters to the nearby lake (negotiations with the owners of the lake failed to produce the required consent). It is, therefore, necessary to construct a sanitary sewerage line (length 8 km, approx.) complete with sewage pumping station.

The project also includes a rainwater drainage system and rainwater storage reservoir for attenuation of discharge flow rate. The works are located in the Gdańsk-Zachód quarter, Osowa-Barniewice urban unit area; water treatment station and reservoir are in part of plot Nº 119 found in the Gnieźnieńska Street area – technical infrastructure is in streets: Myśliborska, Gnieźnieńska, Kielnieńska, Chełmińska (Gdańsk), and in plots Nos 236 and 235 (Gdynia). This line will be constructed in land occupied by the planned streets.

The water treatment station will include aerators and two stage filtration for reduction of iron and manganese levels. The reservoir capacity will be 2.600 m^3, with reservoir water level data of 186 – 191 m a.s.l.. Operation of the water intake and water treatment station will be fully automated. Automation will be based on the use of the microprocessor PLC`s at individual process nodes. An external sanitary sewerage, system 8 km long, for removal of flushings from the station area will be constructed within planned streets.

4. *Construction of water main connecting Gdańsk-Osowa with the central Gdańsk water supply system*

The works are located in the urban unit of Osowa-Barniewice housing estate in Gdańsk-Zachód quarter. Water main DN 300, 1.290 linear meters – route along Wodnika Street (with crossing of Nowy Świat Street and Polish State Railways track), and along Meteorytowa Street. Water main

DN 400, 4.600 linear meters – route along Barniewicka and Nowy Świat Street, and along extension of Koziorożca Street to connect with the above DN 300 water main in Meteorytowa Street. Water main DN 500 of 12.510 linear meters to Kiełpino tank – route from Meteorytowa Street (from W-5), through Radiowa, Astronautów, Słowackiego, Budowlanych and Jesienna Streets. This route crosses a railway and runs along the Tri-city bypass (Obwodnica Trójmiejska) and then along Kartuska and Nowa Gostyńska Streets to the Kiełpino tank.

The scheme comprises: ductile iron water mains for Osowa-Barniewice urban units.

The requirement for this task results from planned development of the City of Gdańsk taking place in the areas of Osowa, Barniewice, Klukowo, Matarnia, Jasień and Szadółki. Supplies of water required by these areas will be possible only after the water mains (with storage tanks) have been constructed to connect these areas with the central water supply system and with the Kiełpino tank.

5. *Reconstruction of Lipce water treatment station*

The existing water intake in Lipce is located 3,5 km south of Gdańsk downtown area. The length of the water intake wells line is 4,4 km. The northern part of the water intakes is in an area of the City of Gdańsk (in the Śródmieście quarter, Orunia-Olszynka unit), while the southern part of them is found in part in Gdańsk and in part in the commune Pruszcz Gdański. The planned Gdańsk motorway - "Southern Ring Road" – will cross the water intakes site (between currently operational wells nº. K-2a and 14). A new main building will be constructed within the limits of the existing site. This task provides the construction of a new main building at the Gdańsk-Lipce station, and modernization of existing underground water intake. The parameters requiring treatment are iron, manganese, colour and ammonia. Pilot tests have revealed the need for two filtration stages: the first stage for removal of iron, and a second stage for nitrification and manganese removal. The new building will be secured from flooding. UV water disinfection will be included in the main building. Operation of both water intake and the station will be fully automated. Automation will be based on microprocessor PLC`s installed at individual process nodes. Control of the water intake and treatment station operation will be through the station central computer with transmission of parameters to main SNG dispatch room.

6. *Construction of water main supplying Orunia-Olszynka* area from Lipce water intake.

The works will be in the urban unit of Orunia-Olszynka in the following areas: Olszynka, Dolne Miasto. Water main route – from Poleska Street alongside "Motława" trunk main, with a crossing under the Motława River, crossings under melioration trenches, crossing under Polish State. Railways tracks, crossing under Odpływ Motławy River to Reduta Wilk Street (location of

connection with the existing water main). Difficult soil-water conditions can be expected. The water main route is located in the Vistula River delta and, consequently, high ground water levels will be experienced, combined with the required construction of crossings under rivers and melioration trenches.

This task involves the following

- water main DN 500, of ductile cast iron, 2.858 m,
- water main DN 300, of ductile cast iron, 676 m,
- water main DN 350, of ductile cast iron, 14 m,
- construction by controlled horizontal boring method, PE 450 – 370 m,
- construction by controlled horizontal boring method, PE 350 – 546 m

7. *Treatment of water from the Pręgowo water intake*.

A new treatment station will be constructed for water from the Pregowo intake within the area of existing intake in Pręgowo. Currently, water from Pręgowo is not treated and construction of a new water treatment station at the intake is necessary for treatment of iron and manganese. The proposed treatment processes are aeration and single level filtration (pressure filters) and UV disinfection. There will be a PLC unit controlling operations of the station and connected to the station's computer. This will be connected to the telephone network for supervision of the station's operation.

8. *Construction of water main for quarter Południe*

For areas located between Świętokrzyska and Starogardzka Street, and the Gdańsk borders with communes Kolbudy and Pruszcz Gdański. Route – from water main DN 400 in Wielkopolska Street to water main DN 1.200 in Świętokrzyska Street area; the route of the DN 250 water main will be in Świętokrzyska Street.

The investment comprises:

- water main DN 400, length 1.460 m,
- water main DN 250, length 730 m

9. *Extension of water treatment station Zaspa Wodna*.

The existing station is located at the Wrzeszcz quarter, at the Zaspa-Rozstaje housing estate in Gdańsk. The scope of the project includes metering of water intake, construction of treatment units, treated water reservoir, water pumping station for supply of water to the water supply network, and new infrastructure required by the station. The parameters requiring treatment are

iron, manganese, ammonia and nitrates. Pilot tests have resulted in the following water treatment technology: aeration, stage I filtration (removal of iron), aeration, stage II filtration (manganese removal and biological denitrification) and disinfection of water using sodium hypochlorite (for use in emergency situations). Automation will be based on microprocessor PLC`s installed at individual process nodes. Part of the process will be controlled and monitored by the station central controller.

10. *Reconstruction of water intake and water treatment station Dolina Radości*

    The existing station located in the Oliwa quarter at the urban unit of Lasy Oliwskie. The task covers: construction of pumping station, installation of water UV disinfection system, modernization of existing units and station technical infrastructure. Aeration of the water intake water after reconstruction will be as follows: open aeration introduced because of water alkalinity and degassing taking place in contact chambers.

11. *Water supply of Kokoszki-Bysewo area*.

    This project involves construction of water pipelines in Rakietowa Street and Nowatorów Street (DN 200) – approximately 750 m to facilitate two-way water supply of the residential area of the Kokoszki urban unit, and the pipeline water main in Rakietowa Street (DN 150) – approximately 1.500 m

12. *Construction water pipeline in Żuławy - Olszynka area*.

    The works are located in an area of the Gdańsk-Olszynka quarter. Construction of water supply system is in the following streets: Łanowa, Gęsia, Błońska, Bluszczowa, Śnieżki, Majowa, Miodowa, Stokrotki, Altanki, Szarotki, Jaśminowa, Dzwonki, Niezapominajki, Sierpowa, Jelinki, Piwonii, Listki, Bratki, Tulipanów, Wilgi, Pasieczna, Zuchów, Zagony, Wspólna, Miedza, Pusta, Olszyńska, Goździkowa and Kacza.

    This local water supply system includes: water main DN 300, approximately 700 m; water supply systems: DN 100, approximately 8.500 m, and DN 80, approximately 1.000 m, plus connections (up to meter chambers) - approximately 3.800 m.

    Local water supply system.

    Material scope of the investment:

    Step III, IV and V:

    - water supply main PE 110 (including a short PE 90 section) – 6.870 m;
    - household connections PE 40 ÷ 63 – 307 pieces;

- reconstruction and improvement of road surface,
- restoration of natural environment.

Step VI

- water supply main PE 110 – about 1.500 linear meters;
- water supply main PE 90 – about 1.000 linear meters;
- household connections PE 40 ÷ 63 – about 90 pieces;
- reconstruction and improvement of road surface;
- restoration of natural environment

13. *Re-commissioning of Stara Dolina reservoir*.

The existing reservoir is on a hillside located at the crossing of Bytowska and Kwietniowa Streets in Oliwa district. This project covers re-commissioning of the existing reservoir, with a capacity of 1.200 m^3. The main purpose of the tank is to stabilize the water pressure in the distribution system. This project provides for repair, reconstruction, and re-commissioning of the existing water reservoir. It has not been used for a number of years and requires reconstruction, i.e. construction repair and installation of new technological systems in the reservoir.

14. *Construction of water treatment station Zakoniczyn*.

The new water treatment plant will be built at the site of the 2 existing boreholes "Łostowice" intake that currently are not used. This task has the aim of facilitating the use of the existing underground water resources (300 m^3/h) and water treatment according to water quality that meets Polish and EU standards.

This tasks scope involves the following:

- Using 2 existing wellbores, currently not used
- Drilling 2 new wellbores – one to be used, one kept as reserve

The proposed treatment will include:

- Preliminary aeration of water from the intakes;
- Stage I filtration – removal of iron and partial removal of manganese in pressure filters;
- Water aeration in pressure aerators;
- Full manganese removal – stage II filtration in closed filters;

- Ultraviolet disinfection of water.

A programmer will control the operation of the station. It will be connected to a PC computer. The station computer will be connected to the telephone network to monitor the operation of the station.

15. *Reconstruction of water pumping station Ptasia*

Project targeted at improving water supply reliability in an area that is supplied now from the Straszyn station. This is necessary in order to close down the station in Straszyn. The existing pumping station is located in Ptasia Street area, in the urban unit of Chełm. This project is to improve water supply reliability in the area that is currently supplied from station Straszyn.

The scope includes installation of extra pumps for pumping of water to area of storage reservoir Migowo.

16. *Construction of new pumping station in the area of Orunia reservoirs, plus construction of two water reservoirs*

The pumping station will be located at the Orunia water reservoirs, in the Nowiny Street area, in the urban unit Maćkowy. The project comprises two new reservoirs, which capacity of 5.000 m^3 each, and a new pumping station with a capacity of 40.000 m^3/d. The operation of the pumping station will be fully automated and combined with transmission of metering results, and remote control from the SNG control room.

17. *Construction of water supply network and new pumping station Sobieski*.

The existing pumping station, in the Suchanino housing estate in Gdańsk, Sobieskiego Street. This task comprises the construction of a water pumping station for Orunia and Migowo reservoirs (capacity 20.000 m^3/d each) and a DN 600 pipeline, approximately 800 m for delivery of water to Migowo reservoirs. In addition, the poor condition of the existing DN 800/1000 pipeline necessitates relining throughout its length. Fully automated operation with transmission of data and remote control from the SNG control room is proposed.

7.4.2 Wastewater Management

18. *Extension of Wastewater Treatment Plant Gdansk – Wschod – connection of Zaspa WWTP basin*

The project "Closure of Zaspa sewage treatment plant" is composed of three interdependent tasks.

Task 1 – Reversal of the Zaspa sewage treatment plant sewerage system to pumping station Ołowianka.

Task 2 – Construction of the second pressure sewer line, Ołowianka II, from pumping station Ołowianka to Sewage Treatment Plant Wschód.

Task 3 – Demolition of the decommissioned objects of the Zaspa sewage treatment plant.

Task 1. Reversal of the Zaspa sewage treatment plant sewerage system

This task consists of the transfer of sewage from the drainage area of the Zaspa sewage treatment plant to the pumping station Ołowianka, and then through the existing and newly designed Ołowianka II pumping main (Task 2) to Sewage Treatment Plant Gdańsk – Wschód. To this end, the following existing units at Zaspa sewage treatment plant will be utilized after reconstruction: screens and pumping station. Sewage will be pumped through a pumping main to a trunk sewer draining to pumping station Ołowianka.

From Zaspa pumping station to Wyspiańskiego Street (distance 2,4-2,5 km) a pressure pipeline is to be constructed, DN 800, using either the existing gravity sewers in Hallera street (Option I), or a new pipeline is to be constructed on a parallel route (Option II), connected (at the Kliniczna Junction) to the existing trunk sewer "Przymorze – Ołowianka". This will facilitate reversal of the Zaspa sewage treatment plant sewerage system.

In Option I, the use of the existing brickwork trunk sewers in Hallera Street, i.e. the operational bell shaped trunk sewer, DZ 1,2x1,1 m, and decommissioned egg shaped trunk sewer, J 0,7x1,05 m, is planned throughout practically the whole distance from the Zaspa sewage treatment plant to trunk sewer "Przymorze – Ołowianka". These trunk sewers were constructed in the thirties but, according to monitoring surveys, they are in a good condition.

Both sewers are of non-standard cross-sections, preventing application of the same technology in their transformation into the pressure trunk sewer design (according to hydraulic analysis their diameter should be DN 800). Thus it is recommended that, for the bell shaped trunk sewer, a continuous 800 mm internal diameter pipe (DZ 900) is inserted into the sewer and the annular free space grouted up. The egg shaped trunk sewer, J 0,7x1,05 m, is not able to contain a DZ 900 pipe, but its cross-section roughly matches the cross-section of DN 800 pipe. Upgrading of the egg trunk sewer is therefore recommended, consisting of the insertion of a resin impregnated flexible sleeve ('InsituForm') in contact with the sewer walls, followed by its thermal hardening. This is an inert, non toxic polyester resin strengthened with fiber glass.

Option II provides for a new pressure main route. Due to the dense technical infrastructure found there, a major length of this route will require the application of an unconventional construction method, e.g. microtunneling. In addition, the route crosses not only the State Treasury and municipal lands but also:

allotment gardens and private land plots in perpetual lease by the POD

Roman-Catholic Parish site at Mickiewicza Street

land plot of Medical Academy, and

private plot at Żywiecka Street.

The new function of Zaspa pumping station also requires the following operations that are common to both options:

- Modernization of Zaspa pumping station
- Extension by some 550 m of a gravity sewer connected to inlet of the sewage pumping station Uczniowska, combined with closure of the current pressure pipeline "sewage pumping station Uczniowska – Zaspa sewage treatment plant"
- Construction of a transfer sewage pumping station at the Zaspa sewage treatment plant, for transfer of sewage from current drainage area of the sewage pumping stations Uczniowska and Brzeźno to upstream of the screens of the planned Zaspa sewage pumping station
- Construction of local pumping stations at the Bohaterów Getta Street and the Medical High School.

Task 2. Construction of second line of pressure trunk main from pumping station Ołowianka to Sewage Treatment Plant Wschód

The planned pressure pipeline, DN 1200, Ołowianka II, length 7,5 km, runs from pumping station Ołowianka through a crossing at Na Stępka canal, through existing and planned streets, near Rudnickiego canal, and then through farming lands of Błonia to finally run in parallel with the existing pressure pipeline, DN 1200, from pumping station Ołowianka, to the Sewage Treatment Plant Gdańsk-Wschód. This pipeline is to be constructed in the roadway of streets Na Stępce, Siennicka, Wiesława, Głębocka, Elbląska, and then in the roadway of the planned Nowa Sandomierska road, along Rudnickiego canal, and then in parallel with the existing pipeline DN 1200 to Sewage Treatment Plant Wschód.

Connection-venting and drain chambers will be constructed in the pipeline route to facilitate simultaneous operation of existing pressure pipelines "sewage pumping station Ołowianka – Sewage Treatment Plant Wschód", and "sewage pumping station Mołtawa – Sewage Treatment Plant Wschód".

With regards to the method of the Na Stępce canal crossing (controlled by the Marine Board), it was agreed that the following two methods of crossing be evaluated:

- Crossing constructed above canal, in parallel to the existing main, and
- Crossing under the canal bottom.

Relevant technological options have been elaborated for the two solutions.

Task 3. Demolition of decommissioned objects of Zaspa sewage treatment plant

It is planned that some 95% of the Zaspa sewage treatment plant units and lands will be closed and assigned to other uses. It is also assumed that only those units that are to be operated after modernization as active elements of the sewerage system will remain in place.

The objects to be demolished include:

Site at Uczniowska Street: 0pen digestive chambers, sludge drying beds, sewage pumping stations, welfare building with boiler room, and technological systems.

Site of the Zaspa sewage treatment plant: aerated grease removal tank, Imhoff settling tanks, 1st stage aeration chambers, 1st stage secondary settling tanks, 2nd stage aeration chambers, radial secondary settling tanks, sludge pumping stations, sealed digestive chambers, biogas holder, boiler house with heat-exchanger shop, old chlorination plant building, transformer station, workshop building, fuel store, construction camp barrack, inter-object pipelines (in part), internal roads (in part), and model testing building.

The units left in place, subject to modernization, include:

- Screen station
- Grit chamber
- Machine-room/technological building (sewage pumping station, control room, blower shop, secondary sludge pumping station)
- Administration building

Closure of the Zaspa sewage treatment plant will change the use of the land. From 01.01.2003, the local land development plan is not longer in effect at that site. According to a letter of the Gdańsk Development Office, ref No. BRG IZUP/208/AK/2003/3370, dated 16.05.03, parks, lawns, and historical and thematic gardens will be located at this site, with no less than 80% of total area being developed as a biologically active one.

The following areas of the current sewage treatment plant area of 21,5 ha. Approximately, are planned for assignment to development:

- Land at Uczniowska Street – 14,5 ha.

- Land at Hallera Street – 6,5 ha. (0,5 ha. is to remain in use by the SNG S.A.)

Two technological options have been elaborated for task 3, depending on degree of demolition of the buried reinforced concrete (ferroconcrete) objects:

- Liquidation of objects down to 1,5 m below ground level
- Total liquidation of objects

19. *Sewage system Osowa – Barniewice – Klukowo*

This task provides the construction of a trunk sewer, diameter 800 and 600 mm, length 3.800 m, delivering sewage to the existing Bysewo sewage treatment plant that is subject to modernization. The 600 mm collector will be placed in the following streets: Budowlanych, Przyrodników, Nowatorów, Słowackiego, Spadochroniarzy, Radiowej and Telewizyjnej and partly under the airport platform.

Two more trunk sewers will be also constructed, one of 500 mm diameter and 1.600 m length, connecting the planned pumping station PO with the Osowa-Oliwa trunk sewer; and the other will have diameters of 500 and 400 mm, with a total length of 2.750 m. The sewerage networks of the housing estates will comprise a total length of 13.500 m, with diameters from 150 to 300 mm, supplemented by 730 house connections (up to property boundaries), total length 1.800 m, three automated sewage pumping stations, delivery 10-180 l/sec. and 2.550 m of pressure pipelines.

Currently, cesspools are used in this area. These are not always leak-proof.

20. *Sewage and storm water system for Zabornia district*

The new housing estates in this area are not connected to the sewerage system. Gravitaty and pressure pipes will be placed in the following streets: Kartuska, Czereśniowa and Jarzębinowa. Construction of automated pumping stations, gravity sewers – diameter 200 mm, length 1.800 m, pressure pipeline – length 300 m and some 30 house connections (up to property boundaries) is required. Within the task elements of underground infrastructure will be reconstructed and street pavements reinstated.

Currently, cesspools are used in this area. These are not always leak-proof.

21. *Sewage system for Jasień Wieś*

In the Jasień quarter, that neighbours on Zabornia, there are similar problems. Their solution requires construction of 1.300 m of sanitary sewers and 70 house connections (up to property boundaries) totaling to a length of 500 m. At the same time elements of underground infrastructure will be reconstructed and street pavements reinstated. Sewers are planned in

Kartuska street, between the Morena collector and Leszczynowa Street, in Jaworowa Street, and in internal streets of housing estates.

Currently, cesspools are used in this area. These are not always leak-proof.

22. *Sewage system for Łostowice district*

No organized sanitary sewerage system exists in this quarter. Currently, cesspools are used in this area. These are not always leak-proof. Solution of this problem requires construction of 2.500 m of PVC sewers, diameters from 200 to 315 mm, and 135 house connections (up to property boundaries) totaling to 700 m. Implementation of these works will require reconstruction of elements of underground infrastructure within the task, construction of a section of the storm-water drainage system, and reinstatement of street surfaces.

The planned course of the system includes the following streets Wielkopolska, Darżlubska, Karkonoska, Bieszczadzka, Pienińska, Rosiczki, Szymbarska and Sasankowa.

23. *Sewage system for Sobieszewska Island*

Construction of complete sewerage system for the Sobieszewska Island requires 5.700 m of sanitary sewerage network, 200 house connections (up to property boundaries), 1.000 m of pressure pipelines and 5 complete sewage pumping stations. Sewers are planned between the intersection of Boguckiego and Świbnieńska streets and Przegaliny Street. Construction of an internal system in Przegalina housing estate is planned.

Currently, cesspools are used in this area. These are not always leak-proof.

24. *Building of sewage system for Gdansk – Orunia*

This is an area with no sanitary sewerage. Plans provide for construction of 4.500 m of street sewerage network, 170 house connections (up to property boundaries), 3 pumping stations and 900 m of pressure pipelines. The sewers will be placed along the following streets: Przybrzeżna, Równa, Kolonia Rola, Żabia, Smolna, Daleka.

Currently, cesspools are used in this area. These are not always leak-proof.

25. *Building of sewage system for Olszynka district*

Currently, cesspools are used in this area, but these are not always leak-proof. Construction of 9.600 m of street sanitary sewers, 400 house connections (up to property boundaries), 5 pumping stations and 1.700 m of pressure pipelines is required. The above network construction will entail reconstruction of street surfaces. Sewers will be placed in the following streets: Łanowa, Gęsia, Błońska, Bluszczowa, Ścieżki, Stokrotki, Altanki, Szarotki, Jaśminowa, Dzwonki, Niezapominajki,

Piwonii, Listki, Bratki, Tulipanów, Wilgi, Pasieczna, Sierpowa, Jelinki, Zuchów, Majowa, Miodowa, Zagony, Wspólna, Miedzy, Krótkiej, Pustej, Goździkowa, Kacza, and Olszyńska.

26. *Building of sewage system for district Kiełpino Górne*

    This residential quarter requires construction of 15.800 m of sanitary sewers (including 700 house connections up to property boundaries), 2 pumping stations, and 750 m of pressure pipelines. Sewers have been planned in the following streets: Węsierska, Tuchomska, Łapińska, Widlińska, Lublewska, Gołuńska, Sulmińska, Kiszewska, Otomińska, Goplańska, Wdzydzka, Karsińska, Somińska, Wielewska and Kolbudzka, Lipuska.

    Currently, cesspools are used in this area. These are not always leak-proof.

27. *Sewage system for districts Święty Wojciech , Lipce and surrounding areas*

    There is currently no sanitary sewerage system in this quarter. Its connection to the municipal sewerage system requires construction of 15.200 m of gravity sewers – diameters from 200 to 300 mm, 900 house connections (up to property boundaries) totaling to 4.350 m, 3 pumping stations and 600 m pressure pipelines. Implementation of these works will require reconstruction of elements of underground infrastructure, construction of a section of the storm-water drainage system, and reinstatement of street surfaces. The planned location includes the following streets Trakt Świętego Wojciecha, Batalionów Chłopskich, Rzeczna, Borkowska, Wąwóz, Po Schodkach, Stroma, Starogardzka, Nowiny.

    Currently, cesspools are used in this area. These are not always leak-proof.

28. *Extension of WWTP Gdansk Wschod – stage II b – sludge management, more strict nitrogen removal requirements*

    The modernization of the Sewage Treatment Plant Wschód is to achieve the following two main objectives: treated sewage concentration of N_{og}<10mg/l, and a satisfactory method of final disposal of sludge.

    Improvement of pretreatment requires replacement of ineffective screens by modern fine screens fitted with screenings-flushing and screen-washing system using treated sewage, supplemented by screw press for transport and dewatering of screenings. The next activity should be targeted at improved removal of inorganic solids and grease in the grit chambers. Achievement of this objective requires construction of new, properly designed grit chambers and reconstruction of the existing ones.

    A number of proposals were evaluated in reference to biological treatment process, targeted at maximum denitrification in bioreactors:

- Sequential aeration of sewage
- Increase of internal recirculation intensity
- Intensification of nitrification processes through increase of oxygen concentration in chamber
- Replacement of the current UCT process by the classic modified Bardenpho process
- Introduction of separate pretreatment system for high-nitrogen effluents from centrifugal separators and sludge thickeners
- Batching of methanol into internal recirculate to improve BOD/N ratio
- Inclusion of modernized sludge hydrolyser in the process
- Improved removal of foam at secondary settling tanks.

The effectiveness of possible activities meant to improve the methane digestion process capacity was analyzed in the context of sludge management solutions. These activities would cover modernization of the digestion tanks, consisting of replacement of stirrers, reconstruction of their upper parts and modification of internal recirculation system, and construction of a surplus sludge disintegration station. The disintegration station could employ either the caviation, ultrasonic or Lization method and its implementation would require transformation of the currently non operational gravity thickener into a mixing tank where disintegrated secondary sludge and primary sludge would be mixed.

The project will include the following:

1. Band screens. The band screens will be installed at an angle of 85^0 in a 1,3 m wide channel, with a maximum water depth of 1,7 m. The mesh size will be 3 mm (fine screen). The screens will be fitted with spray backwash to prevent adhesion of screenings to the band. The screens are made of plastic material (band) and acid resistant steel (frame and other structural elements); housing is made of acid resistant steel.
2. Aerated grit chambers. Each grit chamber will house an aerated flow chamber where grit, floating organic matter and grease will be separated. It is expected that the grit chambers will remove more than 95% sand grains of equivalent size exceeding 0.16 mm – even with inflow of storm-water.
3. Digester (hydrolyser) of pretreated sludge (after redesigning). The digester (hydrolyser) is currently a unit composed of three chambers connected in parallel, equipped with three agitators. It will be redesigned to facilitate separation of supernatant liquor from the thickened sludge, as this function is not available now at the digester. It will be also equipped with agitators of higher capacity, to prevent settlement of pretreated sludge in the digester bottom.

4. Primary settlement tanks. The primary settlement tanks are currently operated to achieve preliminary digestion of sludge in addition to the settling process. Elimination of the preliminary digestion process from the settlement tanks will facilitate higher hydraulic loading. This, however, will be possible only after the pretreated sludge digester (hydrolyser) is redesigned and reconstructed (as discussed above). Replacement of the current sludge scrapers of the settlement tanks will be also required.

5. Introduction of classic Bardenpho process to the bioreactors. Switching of bioreactors to the classic 3-stage Bardenpho process (to replace the current UCT one) will be possible when the denitrification volume is increased, combined with repositioning of the return activated sludge discharge point and repositioning one set of internal recirculation pumps.

6. Increase of internal circulation intensity in bioreactors. Increase of internal recirculation intensity in bioreactors by replacing the second set of internal recirculation pumps with higher powered pumps.

7. Installation of methanol batching system. The methanol batching system will be similar to the existing PIX batching plant (polyester/fiberglass tank, total capacity 28 m^3 + 6 batching pumps).

8. Reconstruction of skimmer for skimming and collection of float from secondary settling tanks. Reconstruction of this system should be designed for transfer of the float collection chamber within the area that is determined by the scum board – not to outside the tank as present.

There are four existing open digestion tanks, approximately 20 000 m^3 each, at the Sewage Treatment Plant Gdańsk-Wschód. To facilitate emergency sludge discharge from the closed digestion tanks, two of the four open tanks will be reconstructed including sealing the tanks, installing two-side barriers of acid resistant steel at the tank top, reconstructing the lighting system, introducing agitation of digested sludge discharged to the open tanks and modernizing the existing pumping station complete with necessary piping.

To reduce consumption of fresh water at the Sewage Treatment Plant, a pumped distribution system based on treated sewage collected from the secondary settlement tanks will be provided.

Maintenance of the sewerage system requires regular cleaning of gullies and removal of the contaminated sand that is found there. After its removal the sludge from the gullies must be flushed and the coarse waste materials separated. A separate system will be installed to that end at the wastewater treatment plant, located close to the point where transported sludge is discharged.

The electricity distribution system within WWTP Wschod will be extended to serve all the above new facilities.

Trials on alternative sludge disintegration methods will be carried out at the treatment plant prior to deciding which method will be adopted.

8. ENVIRONMENTAL BASELINE

8.1 GEOGRAPHICAL LOCATION OF GDAŃSK AND GEO-PHYSICAL FEATURES OF THE REGION

The city of Gdańsk is situated on the left hand side of the Wisła River where it joins with Gdańsk Bay. It has four distinct geo-physical regions: Żuławy Wiślane, Pobrzeże Kaszubskie, Mierzeja Wiślana, and Pojezierze Kaszubskie.

Żuławy Wiślane is a vast plain (partially depressed), made up of alluvial soils (sandy and silty) and organogenic formations (peat and sludge-peat formations). There is a complicated hydrographical system with two, mutually supplementary types of run-off, namely gravitational and polder. In view of the fertile fen soils, the most common land-use is agriculture with arable fields, meadows and pastures.

Pobrzeże Kaszubskie lies in the north-eastern part of the city. This is the so-called Oliwsko-Wrzeszczańska Platform – an extended erosion terrace with alluvial fans shaped by water-courses. The bedrock consists mostly of sand and gravel. The whole area slopes towards the sea with the main run-off through two watercourses – Strzyża, leading to the Martwa Wisła, and the Jelitkowski Stream, which leads into Gdańsk Bay.

Mierzeja Wiślana extends as a narrow coastal belt from Sopot in a south-easterly direction. It is criss-crossed by streams and rivers and their associated estuaries, especially the Wisła (Martwa Wisła, Wisła Śmiała and Przekop Wisły). The sandbar consists of dunes, shaped by eolian processes. There are hills with irregular formations and dune bars, marking successive stages of land accretion.

Pojezierze Kaszubskie consists mainly of hilly moraines, with plains and, again, alluvial fans of sand and gravel. The highly varied topographic profile is from deep sub-glacial cuts, which are in many places filled with water (lakes), and also by river valleys. However, despite the occurrence of many natural springs, the river network is poorly developed. There are also a lot of areas with no surface run-off.

8.2 GEOLOGY

The Gdańsk area has a considerable morphogenetic structure. The western part of the city is covered with moraine with two discernable features: an upper surface layer and its edges.

The upper surface is found at different levels: from 30–80m above mean sea water level (mswl) in its southern part, where a hilly ground moraine prevails; 80–110m above mswl in the central part, in which undulating and hilly surfaces prevail; in the north-west 130–150 m above mswl, with a sandy surface and plain or undulating ground moraine; in the south-west from 140–160m above mswl where

end moraines are found (culminating in a layer 161.7 m above mswl in the north-east from Smęgorzyno).

This upper surface is varied with many valley forms, especially deep sub-glacial cuts, the Osowskie and Wysockie Lake in the north-western part of the city, and in the remaining part the valleys lead towards the edges and then to the sea.

On the edges of the upper surface of moraine, there is a dense network of eroded valleys of various importance and size. As a result, there are hills and valleys with steep slopes (up to 50^0) with heights reaching about 100m. In the northern part, the basic slopes are at a height of 150m above mswl, 110–120m above mswl in the central part, and to about 40-50m above maswl in the least developed southern part.

At the foot of the upper surface there is an erosion terrace again shaped by alluvial fans. The approximate height is from a few meters up to 20m, and locally even 40m above mswl in the area of the edges. Sand with layers of mud, organic aggregated mud and peat prevail in the bedrock. The alluvial fans are built up of sand and gravel from the eroded edges.

The alluvial plain covers the south-eastern part of the city. It is situated up to 2m above mswl within city boundaries. However, some areas lie in a depression with a minimum level of 0.7m below mswl near Olszynka. Its shape is varied due to anthropogenic activities such as flood banks, channels and ditches. At the edges of the upper surface is a belt of slope washes situated slightly higher. However, it is connected with the upper surface and not with the delta.

Except for areas of city development, organic aggregated muds and peat with fine-grained sand of river accumulation prevail in the alluvial plain. In urban areas there are earth and debris embankments with an average strata depth of 2 – 3 m.

Seaside dunes occur within the main Mierzeja Wiślana, which is built up of irregularly-shaped parallel dunes with heights increasing in an easterly direction – up to 25m above mswl. The majority of dunes are stabilized by forests, especially seaside pine trees. Well-sorted, medium-grained sand prevails in the vicinity of the dunes. Between the dunes there are hollows, in which sand and organogenic formations occur.

8.3 SOIL

With reference to the geo-morphological and geological characteristics and the consequences of long-term anthropogenic activities, the soils of Gdańsk can be divided into the following basic groups:

- Soils built up of post-glacial formations with an upper surface of moraine forming the Pojezierze Kaszubskie, mainly brown soils and rather sporadically podsols;

- Fen soil prevailing on the Zuławy alluvial plain;
- Dune soil of Mierzeja Wiślana, mainly eolian regosols, and poorly formatted podsols;
- Bog and post-bog soils;
- Soils as a consequence of agricultural and industrial activities.

There are also soils within the upper moraine surface associated with lithological mosaics and varied landscapes. Depending upon their physio-chemical composition, they either belong to brown soils or to podsols on poorer sand formations. They also consist of bog (sludge and peat) and post bog soils (muds and black earth), occurring in valley bottoms and shallow hollows associated with groundwater.

Fen soils (light, medium and heavy) of the Wisła River delta also vary according to the type of deposit. There are silty-sludges, sludge deposits, and sand deposits often impermeable where very light fen soil occurs. In some parts there is peat soil. Soil irrigation in Zuławy Wiślane is regulated by a developed land protection system.

The soils of the dune area are mainly made up of sand and are homogeneous as regards of traction and mineral deposits. Differences occur during soil-forming periods with various processes affecting landscape, water conditions and flora.

There are also soils altered in view of intensive land development. These can be divided into hortisols, rich in humus, and rigosols, which occur especially in residential districts and allotment gardens. Where there has been industrial activity, the soils are both mechanically and chemically altered. Within the city boundaries, these types of soil are common in port-industrial districts.

8.4 CLIMATE

Gdańsk lies in a moderate transitional climate between oceanic and continental zones, modified by its close vicinity to the Baltic Sea. The most characteristic feature is variable weather with relatively mild seasonal fluctuations when compared to inland temperatures (milder winter, lower temperatures in summer).

Average monthly temperatures range from –1ºC in December, January, and February, to +17ºC in July.

Humidity conditions are typical for seaside areas. There are clear thermal differences between a warmer autumn and cooler spring, and a permanent increase of relative humidity per year.

Gdańsk is also characterised by a relatively low annual rainfall (below 550mm) as a consequence of being in the Pojezierze Pomorskie rainfall zone.

The predominant wind direction is westerly as a result of zonal circulation. The highest average wind velocities are from November to March. It is also found that only the smallest cloud cover is observed along the entire Baltic coast during the summer months.

8.5 FLORA AND FAUNA

Only a few large but several smaller forests can be found in and around Gdańsk. The more significant are:

- Lasy Oliwskie – situated in the edge of the upper surface and next to Sopot, including the areas of Matemblewo – mainly made up of beech and oak growing on dry ground and marshy meadows;
- The sandbar belt forests cut by the Wisła River estuary– in Brzeźno, Stogi, and Wyspa Sobieszowska – mainly made up of common pine, alder in hollows between dunes, bogland birch and seaside oak;
- Smaller woodlands situated within the boundaries of the city, e.g. part of Lasy Otomińskie near Smęgorzyno and the local forests of Wrzeszcz.

There are also other types of forest and scrub. These are mainly regenerative and with successive forms of alder and especially willow.

Very specific and typical for the scenery of some districts in Gdańsk, are the fast growing brooms found in open areas and then left unattended.

In the sandbar belt, outside the forest areas are also moors. Numerous meadows and pastures occur on fenland. They are not significantly varied, but are often of high quality such as in Stogi along the Martwa Wisła. There is also a high occurrence of halophytes.

Aquatic and waterside flora are associated with water courses and reservoirs. Lake shores are surrounded by a narrow belt of reed, calamus and manna grass, and less often orris. Flora in the majority of lakes is, to a great extent, limited as a result of water pollution. Aquatic flora occurring within the Wisła River estuary are similar to that found in the lower regions of the river. Except for common species concentrated mainly along the shores, numerous aquatic plants from side streams and old river beds are transported here during periods of flooding. The fringes of Przekop have a relatively stable environment and are rich in waterside flora. Wisła Martwa and Śmiała also have a lush flora, yet limited again due to pollution. Along the shores there are narrow belts of reed, sedge and seaside rushes. Also halophytes occur along the Wisła River in the area of Wyspa Sobieszewska, as well as near Przeróbka, Stogi, Krakowiec and Górki Zachodnie.

A very specific floral environment occurs in the 'white and grey' seaside dunes. The white dunes are characterised by sand wild-rye, the European wild-rye and red fescue. The belt of dunes further from the sea with a thin humus layer are called grey dunes and are covered by perennial flora. In some parts there are numerous lichens and mosses, and fern on the steep, slopes out of direct sunlight.

Flora as a result of anthropogenic activities play an important role in the city, mainly in parks (Oliwski named A. Mickiewicza, Oruński, Jelitkowski and Brzeźnieński), public squares, cemeteries (near Brama Oliwska, Srebrzysko, Emaus, Oliwa) and avenues of trees growing alongside the streets. A lot of these places require protection by virtue of their natural and cultural value. Especially the older trees and bushes are worth protecting.

The fauna is also rich and varied. A large group of mammals living in the Gdańsk area are associated with forest complexes (roe-deer, red deer, wild boar, fox, marten, weasel, hedgehog, hare). There is also a range of smaller species, such as forest mouse, ginger vole, and mole. Bats are a significant group of mammals, and their presence indicates a good state of the environment. In recent years, seals have also been recorded as entering the Wisła River estuary – Przekop and Wisła Smiała.

In addition, living alongside the human population, are several common faunal species such as rats, mice, cats and dogs (bred and wild).

More than 200 types of birds occur in the Gdańsk area (Gromadzki, Herbich 1997). A great number of common species are nesting, as well as the more rarer species such as crane, black cormorant and waxwing.

In the past, numerous types of amphibia and reptiles occured in the city area (grass-snake, blind-worm, several species of frogs and toads). Nowadays, snakes are rare. Also, the presence of amphibia is limited because of land drainage and decreased wetland habitats. As regards to reptiles, lizards *Lacerta aquilis* and *L. vivipara* are present although the viper *Vipera berus* is very rare.

The ichthyofauna is rich and varied depending upon the presence of different water bodies: Gdańsk Bay, lakes, ponds and water-courses – from the Wisła River to the Motława River including small streams. There are sea water species such as sprat, herring, sandeel and cod, and freshwater species such as perch, pike and carp. Migratory salmon, sea trout and eel are also present.

8.6 LANDSCAPE

The location of the city of Gdańsk in the point of contact of four distinct physico-geographical units (the morainic plateau with the edge zone, the glacial attrition-accumulation platform, the coastal zone and the wide delta of a large river), gives rise to a significant diversity of the landscape within the city area, with many characteristic features. For that reason, there are many interesting areas of unique natural landscape values, within the administrative boundaries of the city. Despite the fact that in

many cases theses areas are transformed as a result of the human activity, there are still areas, which keep relatively natural landscape conditions. These are as follows:

- Bank of the Wisła River in the vicinity of Stogi district and on the Wisła Sobieszewska section;
- Delta of the Wisła River;
- Forested edge zone of the morainic plateau of the Pomeranian Lake District;

Generally, the landscape values should be assessed as very high, due to the occurrence of diversified forms of the landscape features and the allocated land uses. The landscape value is often reflected in many forms of landscape protection within the city area, including the nature protection areas, the Tri-City Landscape Park and the designated landscape protection areas.

8.7 HYDROLOGICAL AND HYDROGEOLOGICAL CONDITIONS

8.7.1 Hydrographic System of Gdańsk and Service Area

As mentioned above, Gdańsk is situated within four highly varied geophysical areas which causes great spacial variability in the environmental conditions. Its location in a seaside zone, with the sea influencing the land environment, affects the landscape, hydrographic system and climate.

One of the characteristic features of Gdańsk is its morphogenetic variability. The most popular classification is into the so-called lower terrace (Oliwsko-Wrzeszczańska Platform and some parts of Żuławy Wiślane and Mierzeja Wiślana) and upper terrace (top surface of Wysoczyzna Gdańska), separated by a highly cut edge of Wysoczyzna, where the height differences reach 100m.

The upper terrace constitutes a watershed zone, from which water is discharged directly to Gdańsk Bay (the river basin of Oliwski Stream and Kołobrzeska ditch), or through Martwa Wisła – the western delta arm of the Wisła River. Its side streams are the Strzyża and the Motława River. Located in the estuary of the Motława River is an artificial Radunia Channel (collecting the streams from the northern part of Gdańsk and built in the XIV century), Czarna Łacha, and Radunia, whose tributary, the Strzelenka Stream drains water running from the top surface in a westerly direction.

Żuławy is covered with a dense network of channels and ditches, functioning within individual polders.

- The hydrology of the Gdańsk area is quite complicated, and influenced by:
- The proximity of Gdańsk Bay and its effect upon the land;
- Great geomorphological-geological variability highly affecting the hydrographic network and deposition of groundwater;
- Long-lasting anthropomorphic interference with water circulation, especially vast development systems such as polders.

The Wisła River has three estuaries flowing in the city and its outskirts (Martwa Wisła, Wisła Śmiała and Przekop Wisły), but only one of them (Przekop Wisły in Świbno) discharges water from the river basin. The average water flow is about 1000 m^3/sec.

Martwa Wisła is strongly influenced by Gdańsk Bay. Sluice gates and lock systems control the sea water level. Despite the lock in Przegalino, the river has its own basin due to the inflow of water from the Motława River and Strzyża.

The estuary of **the Motława River** is on Pojezierze Starogardzkie. Within Żuławy the river flow is controlled within embankments and included in a polder drainage system. Urban development of the estuary – Stara Motława, Nowa Motława and Opływ Motławy has been taking place over the last ten centuries.

Strzyża (Bystrzec Stream I) is on the left hand side of Martwa Wisła, and its source is in the area of Kokoszki. It has numerous tributaries and the more significant are:

- Jasień stream – 3.53 km long;
- Jaśkowa Dolina stream – 3.58 km long;
- Bystrzec II stream – 1.98 km long;
- Matarnicki stream – no data.

The Strzyża river basin is situated in the central-west part of the city and covers 35.15 km^2. In its upper section there is the Jasień lake. Six storage reservoirs have been constructed along the water-course (some of them cannot be fully used because of silt and lack of maintenance).

Along the section below the 'Srebrzysko' reservoir, Strzyża runs in a regular river bed through urban areas (in some sections through closed channels), and at 238m length above Potokowa Street it is within a concrete pipe.

The Radunia River has its source in the central part of Pojezierze Kaszubskie. The prevailing section of the upper surface belongs to the Gdańsk basin area.

Strzelniczka, Święty Wojciech stream, Maćkowy, Oruński and Siedlecki Stream, which drain the upper surface, water courses and man-made ditches of Żuławska plain lead to the Radunia River. In Pruszcz Gdański, Radunia splits into Stara Radunia, flowing through Żuławy and then leads to the Motława River, and further into Nowa Radunia, flowing through a channel at the foot of the upper surface. This flows through the centre of Gdańsk and also leads to the Motława River.

Strzelenka is a tributary of the Radunia River and plays a significant role in draining the western part of the moraine upper surface. Its basin covers over 2500ha. One of the Strzelenka tributaries runs from the long and deep Wysockie Lake and also Osowskie Lake.

Święty Wojciech stream has its source in a south-westerly direction from Borkowo village. It is on the left hand shore of the Radunia Channel, with total length of 5.52km. Several tributaries lead to Święty Wojciech, and the largest is the Borkowo stream – 3.29km long.

The basin of Święty Wojciech stream covers 7.82km^2. It is located in the southern part of the city.

Maćkowy Stream runs off near Borkowo village, and is a left hand tributary of the Radunia Channel. The total length of the stream covers 3.17km. In its upper part it flows through arable land and functions as a drainage channel.

The basin of Maćkowy stream covers 2.83km^2. It is situated on the outskirts of the city at the southern extremities.

Oruński Stream is on the left hand side of Radunia Channel. Its source is situated near a waste dump in Szadółki. Its total length is 7.45km and the more significant tributaries are:

- Szadólski stream – 0.78km long;
- Kozacki stream – 1.72km long;
- Kowalski II stream – 3.42km long.

Nowadays, the Oruński Stream flows in an unprotected river-bed and does not have any storage reservoirs. The existing natural reservoir in Łostowice and two artificial units in Oruński Park are situated beyond the stream. Oruński Stream receives water draining from the Straszyn water pipe, and a main receiver of rain water from the river basin. During heavy rain its flow rapidly increases. The location of the basin is in the south-western part of the city, and it covers 17.27km^2. It is situated on the upper surface and edge zone, where height differences reach 50-60m. The basin is built-up only to a limited extent and the greater part is covered by agricultural-horticultural areas.

Siedlecki Stream originates in the Jasień area and leads to the Radunia Channel (near Hucisko Street). It is 6.94km long.

The basin is situated in the central part of the city. It covers 10.1km^2 and there are six storage reservoirs within it.

Below Zabornia reservoir the water-course is canalised and covered.

Oliwski (Jelitkowski) Stream basin is near Matarnia, on the moraine upper surface. It leads to Gdańsk Bay in Jelitkowo. Some larger tributaries are:

- Zajączkowski (Węglowy) Stream – 1.4km long;
- Czystej Wody (Ustroń) Stream – 1.5km long;
- Ewy (Prochowy) Stream –1.7km long;
- Renuszewski Stream – 3.4km long.

There are 13 storage reservoirs on the main Oliwski Stream, and four on the Renuszewski Stream.

Polders form the hydrographical system of Gdańsk fenland:

- Orunia polder (750ha) draining water through pumping station No. 21 to the Motława River;
- Niegowo polder (340ha) draining water from channel 'A', through pumping station No. 22 to the Rozwójka Channel (also called Czarna Łacha);
- Olszynka polder (725ha) draining water through pumping station No. 20 to the Motława River;
- Rudnicki polder draining water through pumping station No. 5 to Olszyński Channel (also called Rudnicki) and then to Opływ Motławy;
- Przejazdowo polder draining water through pumping station No. 4 to Rozwójka Channel;
- Rafineria polder draining water through its own pumping station to Rozwójka Channel;
- Płonia polder draining water through pumping station No.1 from the main channel 'A' to Rozwójka;
- Wyspa Sobieszewska (1.158ha) draining water from channel 'A' through pumping station No. 34 to Martwa Wisła.

There are a few lakes within the administrative boundaries of the city, the larger ones being Ptasi Raj and Karaś on Wyspa Sobieszewska, Pusty Staw lake in Stogi district, Jasień lake at Trójmiasto Ring Road in the south-western part of the city, and some sections of Osowskie and Wysockie lakes in the north-western part of the city. There are also numerous ponds and water reservoirs of various sizes.
The total length of groundwater courses in Gdańsk Gmina is some 206km and on polders about 77km.

Groundwater (streams, rivers, channels, Gdańsk Bay) are reservoirs for rain water, drained gravitationally and mechanically through a sewage system and ditches. Flooding occurs in some areas where there are faulty rain water sewage systems and when the run-off channels are too small. For example, rain-collectors on the so-called 'lower terrace' cannot cope with run-off water from the upper terrace. This was densely built-up during the 1970s and 1980s and the resulting surface hardening caused an increase in rain water runoff. In Wrzeszcz this problem is more perceptible, because there are no storage reservoirs in the district. Flooding also occurs in Dolne Miasto district when the Motława River is also at full capacity.

In the area of Żuławy Gdańskie and Pas Nadmorski (Lipce, Kolonia Uroda, the areas along community water intakes Czarny Dwór and Zaspa) the problem of flooding caused by a high level of ground water also occurs. It endangers buildings and the quality of drinking water.

The rise of ground water level is a consequence of increased rain water run-off from built-up areas, a decreased number of underground water intakes and low effectiveness of mitigation systems.

8.7.2 Profile of Potable Water-Bearing Layers in the Gdańsk Region

Gdansk is situated on a main underground aquifer known as GZWP No. 111 - Subniecka Gdańska. It lies at an average depth of 150 m below ground level and covers an area of some 1800 km^2. The estimated supply totals up to 110 000 m^3/day. The extension of this Cretaceous aquifer reaches out far beyond the city area. Water resources of GZWP No 111 are well protected from surface contamination with impermeable materials that lay above it, and therefore it has not a designated protection area or any other types of restrictions or land use limitations.

Another underground water supply aquifer in the area is GZWP No 112 – Żuławy Gdańskie, located in the north-eastern region of Gdańsk. The quaternary water level is located at a depth of some 5 – 40m and covers 150 km^2. The estimated water supply is 116 000 m^3/day. The water from this aquifer requires treatment due to the amount of iron and manganese compounds exceeding drinking water quality standards. Water resources of GZWP No 112 are poorly insulated from surface impacts, and therefore they are very vulnerable to contamination. For this reason, there is a protection zone designated for GZWP No 112, in which certain restrictions for the spatial development apply.

The study "Strategy of the development of water supply system for the city of Gdańsk", conducted by a team of experts of the Gdańsk Technical University in 2004, concluded that groundwater resources in the area of Gdańsk are 80% larger than the far-reaching demand for water supply, and that the actual working capacity of the underground water intakes is 47% higher than the water demand expected in 2015.

Water intakes are mostly operated by SAUR Neptun Gdańsk (SNG), which operates 8 underground water intakes, 1 surface water intake, 1 drainage complex, and 15 local intakes. There are also some 120 industrial intakes. These are mainly located within the city limits, but some are found outside, such as:

- underground water intake Bitwy Pod Płowcami (Sopot)
- underground water intake Nowe Sarnie Wzgórze (Sopot)
- underground water intake (drainage) Pręgowo (Gmina Kolbudy)
- a part of the underground water intake Lipce (Gmina Pruszcz Gdański)

- surface water intake Straszyn (Gmina Kolbudy).

Approved or recommended intakes in the whole Gdańsk city area, together with intakes Pręgowo and Straszyn, make up a total supply of 221 016 m^3/day, where:

- underground water 161 016 m^3/day;
- surface water (intake Straszyn) 60 000 m^3/day.

Straszyn, Lipce, Czarny Dwór, Osowa, Zaspa, Dolina Radości are intakes for large supplies, and other intakes are distinctly smaller.

The intakes that are not part of the city water supply and which could be connected (Grodza Kamienna, Zakoniczyn, industrial intake Unikom) are at least 18 768 m^3/day.

A total production capacity of the intakes in Gdańsk area, (including Straszyn, Pręgowo and Lipce), is currently 167 870 m^3/d, where:

- underground water 114 870 m^3/day;
- surface water 53 000 m^3/day.

The operation of the Straszyn intake caused a decrease in underground water levels at key intakes. In addition, the reduction of consumption of underground water manifested itself in a drop of output in particular intakes leading to a shut-down of intakes. Recently, 12 underground water intakes have been shut down.

These actions brought about mirror-image problems connected with flooding in low lying areas and the necessity to drain built-up areas.

A further cause for concern is the recent drop in water consumption. For example, in 1992 the average consumption of water from the municipal water supply was 160 871 m^3/day and in 2001 it was 79 616 m^3/day. During 1992 – 2001 the production of water at the Straszyn intake was decreased by some 4 000 m^3/d, whereas the reduction of the underground water production was almost 77 000 m^3/d in the same period. This way of matching intakes and supply to the drop in the water consumption causes an extra elevation of the underground water levels and exacerbates the associated problems.

8.7.3 Sea Water

Gdańsk is situated on the Wisła estuary next to Gdańsk Bay. This bay is a part of the southern Baltic Sea. Its maximum depth is around 118m, and within the city limits it is characterised by a sand-bar coastline like the Mierzeja Wiślana. The hydrological conditions are influenced by the Wisła River which causes the salinity of the sea water to be decreased to 7-8‰ for the surface levels and more

like 13‰ for bottom levels. The water temperature at the surface reaches up to 20^{o}C in the summer. During cold winters the bay freezes and there are also accumulations of ice float resulting from ice drift. Storms are more intensive from November till March when the average monthly wind speed exceeds 8m/s.

Numerous rivers and streams run through the area of the city. The most important of them is the Wisła River estuary (with Martwa Wisła, Wisła Śmiałą as well as the main estuary of Przekop Wisły) and the water courses flowing into it: Motława along with the largest tributary Radunia and Strzyża. Moreover, the Oliwski Stream flows directly to the sea draining the northern part of city.

Within the city limits there is 26km of coastline. This area is relatively free of pollution associated with sewage and rainwater discharge except in the port complex where there is an outlet for an industrial wastewater treatment plant coastal drainage). However treated wastewater from municipal, industrial and rain run-off sources is discharged through rivers and streams.

8.7.4 State of Surface Water

Monitoring surface water quality including rivers, streams, lakes and rain collectors has been carried out since 1992.

Water courses within the Gdańsk Gmina are characterised by a large variation in the physico-chemical levels of pollution and a high changeability of the micro-biological pollution levels. In 2004, 15 water courses were selected and monitored:

- 5 rivers: Motława, Martwa Wisła, Radunia, Rozwójka, Czarna Łacha;
- 5 streams: Oruński, Siedlicki, Strzyża, Jelitkowski, Rynarzewski;
- 2 rainwater collectors –'Kołobrzeska' collector and its tributary rainwater collector in Brzeźno;
- 1 channel;
- 1 re-directed river flow;
- 1 drainage ditch.

The results obtained show that the selected water courses are (a) physico-chemically meeting the norms (with only 3.7% of the results in Class I-III) but, (b) micro-biologically polluted (only 80% of the results complied with the norms required for water and are of satisfactory quality).

Considering the physico-chemical annual values of the determined indicators, the selected water courses were classified in the following way:

- clean water courses: Jelitkowski Stream, Rynarzewski Stream, Radunia and the Radunia Channel;
- slightly polluted water courses: Motława re-directed flow, Czarna Łacha and Strzyża;

- fairly polluted water courses: Oruński Stream, Siedlicki Stream, 'Kołobrzeska' collector;
- water courses with increased levels of pollution: Motława, Martwa Wisła, rainwater channel from Brzeźno;
- polluted water-courses: drainage ditch in the coastal area and Rozwójka.

In 2004 the average annual values of indicators of physico-chemical pollution were lower in all cases.

Considering the results of all micro-biological tests analysed in view of two criteria (distribution of quality classes and average annual values of the NPL bacteria logarithm), the selected water courses were classified in the following way:

- clean water course – Radunia,
- quite clean water courses – Czarna Łacha and Rozwójka,
- fairly clean water courses – drainage ditch in the coastal area, Motława and Martwa Wisła,
- slightly polluted water courses –Motława re-directed flow, Jelitkowski Stream, the Radunia Channel,
- water course tolerably polluted – Rynarzewski Stream,
- quite considerably polluted water courses – rainwater drain in Brzeźno, 'Kołobrzeska' collector, Strzyża,
- considerably polluted water courses – Siedlicki Stream, Oruński Stream.

In comparison with 2003, a considerable sanitary improvement was noted in Radunia, Czarna Łacha, the Radunia Channel and Rozwójka, while a slight deterioration was noted in Strzyża, Martwa Wisła, Jelitkowski Stream and Motława re-directed flow.

The monitoring of four lakes (Wysockie, Osowskie, Jasień and Pusty Staw) carried out in 2004 showed that the waters of these lakes can be described as:

- micro-biologically clean and often very clean;
- chemically slightly polluted.

A hydrophyte system in Bielkowo purifying a water course (the so-called Rów spod Bielkowa) supplying Goszczyńskie Lake, where the intake of the surface water Straszyn is located, was also monitored during 2004.

The results of testing this system confirms its positive influence, which brings about a reduction in pollution in the water courses. The degree of reduction is about 67% for suspended solids, 39% for

BOD_5, 18% for COD_{Mn}, 98 % for the indicators of microbiological pollution; 19 % for phosphorus, and 60% for nitrogen.

8.7.5 State of Sea Water and the Beaches

The sea waters around Gdańsk were monitored during 2004 on 15 marine locations along the shoreline from the border between Gdańsk and Sopot to Świbno on Sobieszowska Island. Analyses were conducted once a month throughout the year. The results show generally a very low degree of micro-biological pollution exceeding acceptable values defined by the Decree of the Minister of Health on the R*equirements for water in seaside resorts* (Statute Book No 183/2002, item 1530). With reference to four indicators only 0.56 % of the results were above the norms. Also, low levels of physico- chemical pollution were recorded (with reference to 7 parameters, some 1.85 % of the results did not comply with the requirements of the above decree).

The level of pollution of surface waters is thus generally low and the least polluted regions are: Stogi, Jelitkowo on the border with Sopot and the central part of Sobieszewska Island.

Comparing the results of micro-biological analyses from 2004 with the results of 2003 and earlier years, shows that the particularly low level of pollution observed in 2003 was not only sustained, but was also lowered in some areas (Jelitkowo – Stogi). Twelve measuring posts showed the NPL values of faecal coliform bacteria, lower than in 2001, which used to be known as the year with the lowest levels of pollution in the decade from 1993 to 2002.

Thus, the sea surface water of the Gdańsk Bay within the limits of the Gdańsk Gmina fulfil the requirements set out in the above mentioned Decree with reference to micro-biological indicators; periodically, however, the physico-chemical indicators are cause for concern.

Since 1992 estimating the size of specific pollutant loads discharged from Gdańsk Gmina into Gdańsk Bay covered three sources:

- natural water courses and channels;
- city wastewater treatment plants.
- industrial plants.

The total load is determined on the basis of:

organic substances: BOD_5 and COD;

biogenic substances: general phosphorus and nitrogen;

suspended solids: general suspension.

Flows to the sea are dominated by natural water courses and channels. In 2003 the discharge was over 89.2% of the total amount of outflow from the Gdańsk Gmina to the bay. The discharge from the municipal wastewater treatment plant was about 10.5% and the industrial plants were 0.3% of the total outflow.

A slight increase can be observed (3% in comparison with 2002) in the amount of water discharged by water course and channels and a decrease (about 5% in comparison with 2002) in the amount of sewage discharged from municipal wastewater treatment plants. A slight decrease in the amount of sewage was accompanied by a much larger drop of the above mentioned pollution indicators (18% COD, 68% BOD_5 and 29% total phosphorus and 19% total nitrogen).

An increase of 3% outflow from the water courses caused an increase in the pollution loads – the largest being with total phosphorus and nitrogen being 60% and 50% respectively.

After starting operations of the biological wastewater treatment plant 'Gdańsk Wschód', the proportion of the pollution load expressed by the indicators BOD_5 and COD discharged into Gdańsk Bay by wastewater treatment plants was decreased and from 1999 the predominant pollutant source is from water courses.

A particularly positive phenomenon are large decreases in total phosphorus and nitrogen loads as a result of municipal wastewater treatment plant operations. For the first time in 2003 the wastewater treatment plants did not predominate the share in the decrease in nutrients, their share in total load of these compounds being only 45%. The reduction in nutrients and organic substances is an indication of the high efficiency of the plants.

The total load of suspended solids discharged from Gdańsk Gmina to Gdańsk Bay is barely 1-3% when compared to the Wisła River.

Sea surface waters fulfil the Decree (see above) requirements in the Gdańsk Bay from Sopot to Stogi (except the mouth of the Oliwski Stream and 'Kołobrzeska' collector) and Sobieszowska Island within 500m on both sides of its point of entry to the beach.

Modernisation of the Gdańsk East wastewater treatment plant, where the biological component was in operation and a sanitary collector was put deep in the bay, led to a distinct improvement of the waters in the region of Sobieszowska Island, especially in its eastern part allowing the authorities to increase the range of seaside resorts in the city.

8.7.6 State and Threat for Underground Waters

Exploitation of the underground waters over the last decades has not brought about a stable quality situation and this could lead to further degradation.

In the cretaceous level, a potential natural threat is the concentration of fluorine, which is very costly to remove. However, it is possible to adapt pumping to an acceptable volume that does not enhance the migration and growth of such concentrations. It is also possible to create technical conditions for mixing cretaceous water with quaternary water in order to enrich the quaternary waters in fluorine and at the same time increasing the hardness of cretaceous waters.

With the existence of limestone layers, loams and clay isolating the cretaceous sands from external influences, the pollution of cretaceous waters by surface activity is unlikely.

There is possibly local degradation of cretaceous waters, especially in places where old, unused wells are located, or where wells were abandoned without the proper technical considerations to isolate the water-bearing levels.

In the tertiary level, a natural hazard are compounds of iron, manganese and a discolouring that nevertheless are not increasing in concentration nor effect. This indicates that the natural processes are stable.

In the quaternary level the question of maintaining the natural quality of the water is more complex.

A natural threat is increasing salinity resulting from the ingression of sea water. Lack of proper operational methods and management has led in the past to total degradation of these waters and the disconnection of several industrial and municipal wells.

Another natural hazard is the presence of iron and manganese compounds in superficial deltaic formations in the area around Gdańsk Marshland, i.e. in the region of the 'Lipce' intake. The water in these intake wells do not show increased concentrations of iron and manganese compounds, and rather show a balance in the displacement of the storm waters migrating through soils and the aeration zone to the water-bearing level used by the intake.

The third and the most serious potential pollution of underground quaternary waters is as a result of anthropogenic activities on the surface and in the building/construction zone.

In the highlands, the quaternary waters are protected both by impermeable formations that determine high surface flow out of the area and with only limited infiltration of water carrying possible pollution into the water-bearing levels.

There are entirely different conditions in the coastal terrace. The structure of the terrain with small slopes and sands favour the infiltration of precipitation and the associated leaching of pollutants from the surface to the lower layers.

The clear indicator of the threat is an increased concentration of nitrogen compounds in 'Czarny Dwór' and 'Zaspa' intakes caused by, seemingly harmless, horticultural activity in direct neighbourhood of these intakes.

Protection zones designated for water intakes are described in the following section.

8.8 PROTECTED AREAS

Within the city there are several protected areas of natural environment, including Natura 2000 sites, a landscape park, protected landscape areas, nature preserves, ecological grounds, nature monuments, and 29 fully protected plant species. There are also protection zones that have been designated to protect groundwater supplies.

8.8.1 Natura 2000 Sites

Three Special Protection Areas (SPAs), the Vistula Mouth, the Lower Vistula River Valley, and the Pucka Bay, located on the outskirts of the city (in the Vistula River Valley and on the coast of the Baltic Sea) have been qualified to the NATURA 2000 network, in accordance with a Directive on the conservation of wild birds, called the Bird Directive (79/409/EEC). These areas have been established with a regulation of Minister of Environment dated 21 July 2004 on bird special protection areas Natura 2000 (Dz.U. No 229, it. 2313).

8.8.1.1 PLB220004 – Vistula Mouth

This area covers a significant part of the outer estuary of the Vistula (Wisła) River, from the currently inactive estuary of Wisła Śmiała in the West, to the present estuary of Wisła Przekop along with its on- and off-shore vicinity in the East. This area includes a twelve kilometre coastal zone of the Sobieszewska Island, connecting the two estuaries and a section along the main Vistula river bed adjacent to the estuary, the so-called Wisła Przekop, and its inter-embankment area of 6 kilometres, extending from the sea in the North to the settlement of Przegalina in the South. The total area covers 980 ha.

A nature preserve called Ptasi Raj (188 ha) occupies its western part. A nature preserve Mewia Łacha (150 ha) is located in the eastern part. Both areas contain a mosaic of habitats, including coastal, shallow, and fresh water lakes, wide spread areas of rush reed in the coastal lakes zone as well as in the old halophyte meadows (Ptasi Raj) and a sand reef, separating the lakes from the Baltic Sea. A significant part of the area is occupied by sand dunes covered with vegetation typical for the white or grey sand dunes, in many places overgrown with uneven aged, cultivated pine trees with a significant admixture of deciduous trees. A high mixed forest covers a significant portion of the „Mewia Łacha" nature preserve, while the „Ptasi Raj" nature preserve is covered by cultivated alder, established within the old halophyte meadows and currently disappearing and changing into shrub and rush

communities. The area of Wisła Przekop inter-embankment is taken up by open pastures. An active estuary fan exists at the foreland of the active estuary of Wisła River, causing periodic occurrence and disappearance of sand islands and peninsulas, entering further and further into the sea. In various places the sand dunes have been preserved by planting *Rosa rugosa* or *Salix daphnoides*, which brought about an almost total disappearance of natural vegetation.

The Vistula Mouth is an Important Bird Area of the European status E13.

Found in the area are at least 34 bird species from Annex I to the Bird Directive and 2 species from the Polish Red Book. At least 22 species of wetland birds use the area during their breeding season and at least 120 birds of wetland species have been spotted in the area during their non-breeding season.

During the breeding season the area is inhabited by at least 1% of the national population of the following bird species: white-fronted tern, common gull, and ringed plover. During the migration season this area is occupied by at least 1% of the migration route of the following species: smew, black tern, sandwich tern, little gull, common gull and geese. Found here are relatively high concentrations of black-billed swan, whooper swan, red-throated diver, red-necked phalarope, Arctic tern, Caspian tern, bar-tailed Godwit, curlew sandpiper, dunlin, knot, spotted redshank, white-fronted goose, snipe, curlew, coot, lesser black-backed gull, sanderling, ringed plover, grey plover, black-headed gull, wigeon, red-breasted Mergus; wetland bird species occur in concentrations of above 20000 individuals.

In winter this area is occupied by at least 1% of the migration route population of the following species: smew, tufted duck, goldeneye, long-tailed duck, common gull, scaup; the following species achieve relatively high concentrations: great black-backed gull, merganser, red-breasted mergus; this area is used as wintering grounds by snow bunting (up to 120 individuals).

The area is characterized by a large diversity of habitats; some of which undergo dynamic transformations and fall into successive sequences from pioneer beach communities to coniferous forest communities. Nearly 530 classification units of vascular plants have been founds in the area, of which 17 species are protected by law in Poland and one species, *Aster tripolium*, growing on saline meadows and pastures by Martwa Wisła and Wisła Śmiała belongs to vanishing species at the national level. A numerous population of *Eryngium maritimum* has been recorded in this area.

The western edge of this area lies about 1.5 kilometre away from the border of the WWTP Gdańsk-Wschód area

8.8.1.2 PLB040003 – Lower Vistula River Valley

This area extends over a section of the Vistula River Valley from Włocławek to Przegalina, which preserves the natural character and dynamics of a free flowing river. The river valley retains old river beds and small lowland bogs, its banks are covered with a mosaic of willow thickets and riverside forests. The total area covers 34 798 ha, of which 32% lies within the Pomorskie voivodship.

It is an Important Bird Area of the European status E39.

At least 44 bird species are found here, which are included in Annex I to the Bird Directive, and 1 species from the Polish Red Book. Approximately 180 bird species breed here. It is an important bird area for migrating and wintering birds; an important wintering ground for the white-tailed eagle.

During the breeding season this area is inhabited by about 1% of the national population of the following species: merganser, white-fronted tern, river tern, and kingfisher; the corncrake is present in relatively high concentrations. During the migration and wintering seasons wetland birds inhabit this area in concentrations exceeding 20000 individuals. In winter this area is occupied by at least 1% of the migration route population of the following species: white-tailed eagle, goldeneye, and merganser.

This area is also characterized by rich fauna of other vertebrates, rich flora of vascular plants (approximately 1350 species) with numerous endangered species and species protected by law, highly diversified plant communities, including different types of riverside meadows and valuable xerothermic grass.

8.8.1.3 PLB220005 – Pucka Bay

Included in this area are the waters of the western part of Gdańska Bay, bound in the north by the coast of the Hel Peninsula; in the west and the south by the coastline between Władysławowo and the estuary of Wisła Śmiała; and in the east by a line between the Vistula estuary and the end of the Hel Peninsula. This area includes Pucka Bay (10 400 ha) and part of the deeper waters of Gdańska Bay. It also covers the coastal meadows near Osłonino and Rewa. The total area is 61 959 ha.

It is an Important Bird Area of the European status E12.

Found in this area are at least 23 bird species included in Annex I of the Bird Directive and 2 species from the Polish Red Book. More than 1% of the national population of dunlin breeds in this area, the population of ringed plover reaches up to 1% of the national population.

During the migration season at least 1% of the migration route population of the great crested grebe and the Slavonian grebe inhabits this area; found here are relatively high concentrations of the following bird species: whooper swan, wood sandpiper, curlew sandpiper, dunlin, spotted redshank, pochard, turnstone, whimbrel, curlew, oystercatcher, and ringed plover.

In winter at least 1% of the migration route population of the following bird species inhabits this area: smew, tufted duck, goldeneye, merganser, scaup, great crested grebe. Population of the mute swan reaches relatively high concentrations; wetland bird species inhabit this area in concentrations exceeding 20000 individuals.

A Special area of conservation, the Wisłoujście Tower is located within the Gdansk city limits. It has been submitted under Directive on the conservation of natural habitats and of wild fauna and flora, called a Habitat Directive (92/43/EEC).

8.8.1.4 PLH220030 – The Wisłoujście Tower

This is a complex of brick and earth fortifications from the XVII and XVIII century surrounded by a water filled moat and old afforestation. The total area covers 17 ha.

It is the largest wintering ground of the bats Chiroptera (176 individuals, 3-6 species in 2003) in Gdańsk and the second largest in the voivodship.

Significantly greater numbers of hibernating animals (mainly *Myotis nattereri)* have been registered since the cellars of the fortress stopped being used as a warehouse. It is the only wintering ground of the species *Myotis dasycneme* in the region, which is regularly spotted here during winter and the fall migration season. The channels and moats adjacent to the Fortress constitute an optimum foraging ground for the species *Myotis dasycneme*. The species *Myotis myotis* has also been spotted in the area in winter and during the fall migration season.

This area is not protected as a preserve.

8.8.2 Protection Zones for Water Intakes

Legal basis

Acording to the Water Law Act of 18 July 2001 (Journal of Laws Nr 115, item 1229 with subsequent changes), the water intake protection zones are designated to secure households with drinking water supply of appropriate quality.

A protection zone is an area, where notices, prohibitions and restrictions are in force regarding the use of land and water. Two types of protection zones can be distinguished: direct protection zone (designated for any intake), and indirect protection zone (designated depending on hydro-geological conditions).

Landuse of the grounds located within the direct protection zone of both, groundwater and surface water intakes, is prohibited if it is not connected with the exploitation of the water intake. The entire area should be fenced and marked with information boards and "no entry" signs.

In case of the indirect protection zones, different notices and restrictions may apply, depending on the environmental conditions. Prohibitions and restrictions for the indirect protection zone are listed in the article 54 of the Water Law Act.

Protection zones of the water intakes in the Gdańsk Water and Wastewater Project

"Osowa" water intake (task 3)

The water intake protection zone for this water intake is under preparation. The lists of restrictions, prohibitions, and notices shown here are those contaned in the draft regulations. Therefore, they may differ from those that will be set in final regulations.

The following activities should be forbidden in the protection zone:

1. Discharging wastewater into the ground and surface water with the exception of the pre-treated storm water discharged on the basis of the water permission.
2. Utilization of wastewater, sludge or liquid manure for agricultural purposes.
3. Application of agricultural chemicals other than those allowed for the indirect protection zone, in accordance with the register of the agents officially approved for trade and use, published in the Public Information Bulletin by the ministry of agriculture.
4. Overdosing of the agricultural chemicals allowed for the indirect protection zones of the water intakes.
5. Organizing landfill sites for municipal, hazardous and inert waste, as well as for other types of waste.
6. Locating warehouses of oil products and other hazardous or harmful substances, as well as pipelines for transportation of these substances.
7. Organizing parking places and camp sites (with the exception of existing car parks located in the housing areas, along the streets, or used by local companies).
8. Locating cemeteries and animal burying sites.
9. Excavation of mineral materials.
10. Construction of new groundwater intakes, including dug and drilled wells exploiting the first Quaternary water level (Eems interglacial), apart from inspection wells of the "Osowa" water intake.
11. Construction of highways and public roads of higher than local class (prohibition does not refer to modernization of the existing roads and to the roads in the existing housing areas).

12. Transportation through the protection zone and storing within its borders materials which may contaminate the extracted groundwater.
13. Locating other activities which may significantly impact on the quantity or quality of water, without the appropriate protection measures applied.

The following orders should be introduced in the area of the indirect protection zone:

1. Improvement of the water and wastewater management by:
    a. Construction of combined collection systems for wastewater and storm water in the areas of dense residential and recreational developments by 31 December 2015;
    b. On-line control of tightness of the existing septic tanks (cesspits).
2. Liquidation of inactive and superfluous wells.
3. On-line verification and updating of the protective monitoring of the "Osowa" water intake in order to adjust to the observed trends in changes of water quality and groundwater resources.
4. Roads cutting the protection zone should be marked with "no entry" signs for the vehicles transporting material which may contaminate water – within 6 months after the zone is established.

"Lipce" water intake (task 5)

Protection zones for the "Lipce" water intake were established by the Gdańsk Director of the Regional Water Management Board Regulation of 28 April 2004.

The following activities are forbidden in the indirect protection zone:

1. Discharging wastewater into the ground and surface water with the exception of the pre-treated storm water discharged on the basis of the water permission.
2. Utilization of wastewater, sludge or liquid manure for agricultural purposes.
3. Application of agricultural chemicals other than those allowed for the indirect protection zone, in accordance with the register of the herbicides officially approved for trade and use, published in the Public Information Bulletin by the ministry of agriculture.
4. Overdosing of the agricultural chemicals allowed for the indirect protection zones of the water intakes.
5. Locating landfill sites for municipal and industrial waste.
6. Storage or dumping of radioactive waste.

7. Locating industrial plants or animal farms.
8. Locating warehouses of oil products and other hazardous or harmful substances as well as pipelines for transportation of these substances.
9. Organizing parking places and camp sites (except for existing car parks located in the housing areas, along the streets, or used by local companies).
10. Locating cemeteries and animal burying sites.
11. Excavation of mineral materials.
12. Application of deicing chemicals on local roads of hardened surface, which are not equipped with rain drainage system.
13. Dewatering of the construction sites to the wells – does not refer to activities related to water intake operation.
14. Digging wells.
15. Piling.

The following orders are in force within the indirect protection zone:

1. Hazardous materials can be transported only by train or through the planned southern bypass road of Gdańsk city, which will be equipped with appropriate protection measures to counteract the results of accidents.
2. Construction works related to foundation and drillings must be conducted in such a way as to prevent the connection of two water layers, and securing full protection of water bearing layers against contamination.
3. Conducting environmental impact assessment of the planned activities that may significantly affect the environment, for which a duty of preparing the EIA report may be required. EIA should especially recognize the threats to groundwater and propose necessary mitigation measures.
4. Liquidation of not used (superfluous) inspection holes and wells.
5. Construction of combined collection systems for wastewater and storm water in the areas of Rudnica, Rokitnica i Niegowo by 31 December 2012;

Within the indirect protection zone of the "Lipce" water intake, a strict protection area was also designated. Within this strict protection area the following activities are forbidden:

1. Discharging wastewater into the ground or surface water.

2. Application of agricultural chemicals, including herbicides and fertilizers.
3. Utilization of wastewater or sludge for agricultural purposes.
4. Locating landfill sites for municipal and industrial waste.
5. Storage or dumping of radioactive waste.
6. Locating industrial plants or animal farms.
7. Locating warehouses of oil products and other hazardous or harmful substances as well as pipelines for transportation of these substances.
8. Locating petrol stations.
9. Organizing car parking areas, camp sites and bathing sites.
10. Locating cemeteries and animal burying sites.
11. Excavation of mineral materials.
12. Application of deicing chemicals on local roads of hardened surface, which are not equipped with rain drainage system.
13. Digging wells.
14. Piling.
15. Locating residential buildings.
16. Construction of public roads in a way requiring ground replacement.
17. Trenching and dewatering of the construction sites – not referring to activities related to water intake operations.

The orders set up for the strict protection zone are the same as those set for the indirect protection area.

"Pręgowo" water intake (task 7)

According to the decision of Gdańsk Voivod (Governor) No O-V-7622/10/96 of 2 October 1996, the following activities are forbidden within the indirect protection zone:

1. Car washing, organizing car parks and entrance of mechanical vehicles others than those owned by the State Forests administration.
2. Organizing camping sites.
3. Introducing animals, grazing of cattle.

4. Fertilizing meadows with agricultural chemicals.
5. Use of land for agricultural purposes.
6. Application of plant protection chemicals.
7. Conducting ground works, including land improvement works.
8. Excavating of bog lime, peat and other materials.
9. Locating landfill sites and dumping sites for municipal and industrial waste.
10. Discharging wastewater into the surface water or ground.
11. Construction of public roads.
12. Locating residential and industrial buildings as well as animal farms.
13. Locating warehouses of chemical substances, including oil derivatives and storage of these materials.
14. Transportation and dumping of radioactive waste.
15. Locating cemeteries and animal burying sites.
16. Locating new water intakes.

"Dolina Radości" water intake

The protection zones for the "Dolina Radości" water intake are currently in the process of being approved. According to the proposal mentioned in the hydrogeological documentation, the following list of forbidden activities are proposed:

1. Discharging wastewater into the ground or surface water.
2. Utilization of wastewater or sludge for agricultural purposes.
3. Locating industrial plants or animal farms.
4. Locating animal farms.
5. Excavation of mineral materials.
6. Dumping of any type of waste.
7. Organizing car parking areas and camping sites.
8. Locating cemeteries and animal burying sites.
9. Locating warehouses of oil products and other substances as well as pipelines for transportation of these substances.

10. Locating new water intakes.
11. Running any other activities that may have negative impact on quality or quantity of water.

Also, it is proposed to designate a strict protection area, where the following additional restrictions are to be applied:

1. Application of artificial fertilizers and other plant protective chemicals.
2. Animal breeding and grazing.
3. Residential buildings.
4. Construction of public roads.
5. Land improvement and earth trenches.
6. Dewatering of construction sites and construction of permanent drainage systems.

"Zakoniczyn" water intake

There is no hydrogeological documentation prepared for this water intake on the basis of which the requirements for the borders and landuse conditions of the protection zone would be proposed. On the basis of the studies that have been done so far, it can be stated that the water intake will exploit the Quaternary water bearing layer. Therefore, it is probable that the water intake will require the indirect protection zone.

"Straszyn" surface water intake

A procedure of approval of the protection zones for the "Straszyn" surface water intake has been started. For this reason, the below mentioned prohibitions, orders, and restrictions are not final.

The list of the proposed activities forbidden in the indirect protection zone is:

1. Restocking with fish and use of the Straszyn Reservoir for fishery purposes.
2. Rod fishing, bating and water sports in the Straszyn Reservoir. The prohibition of rod fishing does not concern the owner of the water intake.
3. Organizing camping sites at the water banks.
4. Using motor boats with combustion engines.
5. Excavation of gravel, sand and other materials as well as cutting the aquatic plants, with the exception of cuttings performed by the administrator of the water course in order to secure the water flow.

6. Discharging treated wastewater into the ground or water, with the exception of pretreated storm water. The prohibition refers also to the treated wastewater discharged into the ground or water within the confines of the so called ordinary use of water resources (e.g. individual wastewater treatment installations with discharge lower than 5 m^3/d).
7. Using spillways and emergency discharges into the protected waters in the wastewater pumping stations.
8. Construction of water devices connected with fish-breeding of trout and carp as well as fish feeding.
9. Animal watering in the protected waters as well as organizing pastures in a distance shorter than 20 m from the protected waters.
10. Utilization of wastewater for agricultural purposes, with the exception of manure applied in a distance greater than 20 m from banks of water bodies and water infrastructure (channels).
11. Construction of slabs for manure dumping and compost piles in a way not securing water from contamination.
12. Locating industrial plants, animal farms and food processing plants.
13. Locating warehouses of oil products and other substances as well as pipelines for transportation of these substances and the petrol stations.
14. Locating landfill sites.
15. Locating cemeteries and animal burying sites.
16. Construction of new buildings for residential, farm or service purposes at distance lower than 100 m from the banks of water bodies, with the exception of:
    - buildings located within the area of close developments equipped with the sewage system,
    - hydro-power plants.

    The prohibition does not refer to the recreation centers located by the water, which are regulated in the point No. 18.
17. Construction of recreation centers located by the water bodies – this prohibition does not refer to the objects located above the hydro-power plant in Bielkowo, on condition that they are connected to the wastewater collection system.

18. Construction of public roads not equipped with storm water drainage systems and the pre-treatment devices to control discharges into the ground and water.

19. Organizing car parks – the prohibition does not refer to the car parks located in a distance greater than 20 m from the bank of water body if it is located within the close developments and also to the car parks organized at the buildings allowed to be located in the protection zone on condition that the storm water from the car park is pre-treated before it is discharged into the ground or water.

It is proposed to introduce the following orders for the indirect protection zone:

1. Mark the borders of the indirect protection zone of the water intake with information boards, with information with on establishing the protection zone in accordance with the Regulation of Ministry of Environment of 8 November 2004 amending the regulation on the template of information boards informing about the water intake protection zones (J.oL. No 250, item 2506).

2. Place "No entry" signs at the access roads to the Straszyn reservoir, with a notice "Traffic forbidden in both directions, except from the water intake service".

3. Use agricultural chemicals in accordance with the act of 18 December 2003 on plant protection (JoL No 11, item 94) and the register of the agents officially approved for trade and use with the permission of the Ministry of Agriculture and Development of Rural Areas, which is updated on-line on the website of the State Inspection of Plant Species Protection and Seed Production (www.piorin.gov.pl).

4. Catch fish in the Straszyn Reservoir to keep the biological balance.

8.8.3 Pass on the topographic and cadastral maps, with a border of the protection zone marked on them, to the appropriate public administration bodies. **Other Protected Areas**

There are the following nature protection areas located within the boundaries of the city:

- Nature reserves: "The Bird Paradise" (Ptasi Raj), "The Seagull Sandbar" (Mewia Łacha), "The Springs in the Eve Valley" (Źródliska w dolinie Ewy) and "The Hussar Ravine" (Wąwóz Huzarów);
- the Tri-City Landscape Park with its protection zone;
- the protected landscape areas: "The Sobieszewska Island" (OChK Wyspa Sobieszewska), "The Gdańsk Vistula Delta" (OChk Żuławy Gdańskie) and "Otomiński";
- the ecological sites: "The Bat Fort" (Fort Nocek), "A Telescope with Grasshopper" (Luneta z Pasikonikiem) and "The Gunpowder Warehouse by the Horse Chestnuts" (Prochownia pod Kasztanami) – located in the Napoleon Forts on the Grodzisko hill, and the ecological sites

„The Oliwa Bats" (Nocki Oliwskie) and „The Xerothermic Grass in the Valley of the Oruński Stream";

- the protected nature and landscape complexes: „The Valley of the Oruński Stream" and „The Valley of the Strzyża Stream";
- nature monuments – there are 149 nature monuments within the boundaries of the city of Gdańsk, including: 111 individual trees, 25 groups of trees, 1 tree alley, 9 erratic boulders and 2 site monuments;
- species protection – there are 41 protected species of vascular plants, fungus and lichens occurring in the area of city of Gdańsk and 29 of them are strictly protected, while 12 species are under the partial protection. Apart from that, there are other 49 rare species occurring in the city area.

Part of the ventures of the Gdańsk Water and Wastewater Project are located within or in the vicinity of some above mentioned protected areas, which namely are:

Tasks no 10 and 13 – located within the Tri-City Landscape Park

Tasks no 3, 4, 11, 17, 19 – located partially or entirely within the protection zone of the Tri-City Landscape Park.

Task 5 - within the Protected Landscape Area of the Delta of the Wisła River (OChK Żuław Gdańskich)

Task 23 – within the Protected Landscape Area of the Sobieszewska Island (OchK Wyspy Sobieszewskiej).

Task 16 – within the protected nature and landscape complex "The Valley of the Orunia Stream" (Dolina Potoku Oruńskiego).

Task 26 – in the vicinity of the "Otomiński" Protected Landscape Area.

Coastal waters of the Bay of Gdańsk in the vicinity of the city are protected as a part of Natura 2000 network. Two Natura 2000 protected areas: the Bay of Puck PLB220005 and the Wisła River Mouth PLB220004 adjoin the city boundaries.

The Bay of Puck - the northern part of the Bay of Gdańsk, is protected as the Seaside Landscape Park (Nadmorski Park Krajobrazowy). The Bay of Puck is under protection also as the underwater nature reserve designated by HELCOM.

Three areas of protected landscape have been created in Gdansk towards the end of 1994. (Journal of the Gdanskie Voivodship Office, No 27, item 139 of 1994). It is noted that these areas have not been submitted to the Natura 2000 Programme. The areas are:

The Protected Landscape Area of the Sobieszewska Island that covers the entire width of a part of the Wisła Sandbar;

The Otominski Area of Protected Landscape covering areas located partially within the city of Gdansk and the Kolbudy municipality;

The Area of Protected Landscape of Gdanskie Lowlands that covers the entire area of the Gdanskie Lowlands except for their north-western part which is used for industrial and warehousing purposes and for residential dwellings.

8.8.3.1 Tri-city Landscape Park

Established in 1979, the Park occupies an area of 19.930 ha within the urban districts of Gdańsk, Sopot, and Gdynia, the city and municipality of Wejherowo, the municipality of Szemud, and the city of Rumia.

Tri-city Landscape Park is located in the immediate neighbourhood of Tri-city, one of the largest urban agglomerations. It consists of two isolated parts, the larger (northern) part located between Wejherowo and Gdynia and a significantly smaller (southern) part, covering the area between Orłowo, a district of Gdynia and Kiełpinek and Brętowo, districts of Gdańsk.

The park covers a fragment of the north-eastern area of the Kaszubskie Lakeland. It represents an undulated plain of a ground moraine, rising on average 60 m above the level of the sea, which in the East ends with an upland escarpment zone. Higher elevations exceed 200 m above the level of the sea; drops reach more than 80 m locally. A distinct characteristic of the Park's landscape is a well-preserved, diversified topographic profile of the lakeland escarpment zone with erosive clefts creating branched valley systems. Larger valleys have flat bottoms and slopes inclining at more than 40 degrees. The following streams, which in majority originate in the Park, flow through the valleys' floors: Cedron, Cisówka, Marszewska Struga, Swelinia, Świemirowski Stream, Rynarzewski Stream, Prochowy Stream, Zajączkowski Stream, and the Oliwski Stream (Jelitkowski).

Approximately 90% of the Park area is covered by forests, which belong to the Forest Promotional Complex „Oliwsko-Darżlubskie Forests". Nearly all types of lowland forest sites are present here, from woods to alder swamp and marsh forests. There is a significant share of old afforestation. Fields, fresh and wet meadows, and pastures communities are significant among non-forest vegetation in the Park. Communities growing in wellhead areas, high and transitional peat bog communities and water communities of Lobelia lakes (in the northern part) constitute a valuable component of vegetation.

Habitat diversity warrants a wealth of flora species. Nearly 850 species of vascular plants have been spotted in the Park, including 60 protected species, 86 rare and endangered species within Pomorze and 22 endangered species at the national level. More than 150 species of large-fructification fungi

grow in the area, including 10 strictly protected species and at least 30 strictly protected lichen species.

The fauna of the Park is characteristic for the Polish Lowland. Large mammals, such as wild boar, roe-deer, and deer inhabit this area. Elk migrates through this territory sporadically. Hare, wild rabbit, squirrel, fox, badger and other animals have also been spotted in the area. The following rare bird species, among other, breed in this area: white-tailed eagle, goshawk, buzzard, honey buzzard, black stork, and crane. Eleven amphibian and 5 reptile species have been registered in the area. Stream trout is numerous and stream lamprey has been spotted in a few water courses. Rare and protected insects, arachnids, and snails have been recognized among the area invertebrates.

The Park contains seven nature preserves, two of which are located in its southern part. The „Zajęcze Wzgórze" Nature Preserve (11.74 ha in Sopot) protects old beech, pine, and oak trees, of which the oldest trees are more than 200 years old. „Źródliska w Dolinie Ewy" Nature Preserve (12.04 ha in Gdańsk) covers natural riverside, wellhead, herb, and rush communities, including manna grass rush, a rarity in the lowlands. Numerous rare and endangered plant species grow here, including mountainous species.

A historic urban complex of Stara Oliwa and the complex of Oliwskie Valleys border the southern area of the Park. The remains of a historic complex of mills and forges have been preserved in the Oliwski Stream Valley. A branch of Technology Museum occupies one of the preserved forges, located beyond the Park. A former Cistercian monastery complex constitutes the most valuable monument of architecture near the Park, with a Gothic cathedral (containing the famous organ), convent, two abbot palaces, and a park.

8.9 CULTURAL ENVIRONMENT OF GDAŃSK

Gdańsk has a long traditional and historical development and they celebrated 1000 years as a city. The present outlook is a result of technical, economic, social and cultural activities as well as its location on the Wisła estuary. During the 18th, 19th and 20th centuries the political and administrative decisions also played an important role.

Originally the city's development was affected by natural barriers; the earliest colonisation was only possible in a small area limited by sand-bars amongst marshy land in the delta. The Middle Ages brought about spatial development of the city within the limits of the city walls determined by a street network and the rule of division based on the Lubeck Law, the colonisation of rural land situated along streams flowing from the highland (location of the Cistercian Abbey) and the beginning of drainage of the marshlands. Right from the beginning, Gdańsk was a commercial port and centre of shipping. In its prime during the 16th and 17th centuries Gdańsk was surrounded by modern rampart fortifications and new sites on the eastern bank of Motława. A constant growth in the number of buildings within

the area surrounded by fortifications led to the development of suburbs and construction of many suburban manors. The 18th century and the first half of 19th were stagnant as regards spatial development because Gdańsk was primarily developed as a fortress.

The greatest changes in the city occurred at the turn of 19th and 20th century. The technical revolution of the second half of 19th century, the building of railroads, a modern municipal structure and gradual removal of construction limitations connected with its military character contributed to a considerable enlargement of the suburbs and their integration with the city as well as the development of industry and commerce, including the port facilities.

The interwar years brought the creation of the 'Free City of Gdańsk' with dynamic developments in construction - mainly social housing estates with modernist architecture. The destructions post 1945 broke this natural development. A characteristic feature of this post-war period is the introduction of buildings to areas of Gdańsk Highland [Wysoczyzna Gdańska] and the development of the related road transport.

Today, the more valuable cultural heritage is subject to legal protection, consequent to *Protection of relics and keeping relics Act of 23 July 2003.* It refers to all those areas, buildings, complexes as well as land, which are entered into a 'register'. Moreover, the historical city centre of Gdańsk was recognized as a 'memorial to history' by the Decree of the President Polish Republic of 20th September 1994.

The Gdańsk area has 365 historical objects (574 buildings) entered in the register (according to state of works of 17th April 2001) These include urban, rural and military arrangements, courts and palaces, parks and cemeteries, national memorials, industrial units and warehouses, water engineering infrastructure, sacred architecture, buildings of public utility and domestic houses. Already the list shows a great diversity of history and heritage. A natural consequence of such development is a considerable dispersion throughout the area. They are mostly concentrated in the older settlement regions like the city centre and Oliwa.

Apart from the registered historical relics, there are also many cultural artefacts which are not registered. These include housing developments, industrial, military and archaeological sites as well as single buildings. Non-material objects, such as street names, districts, villages, waters and high elevation points are important elements as well.

The cultural scenery includes antique complexes as well. Dynamic development of industry in Gdańsk, particularly at the turn of 19th and 20th centuries, contributed to building many complexes and industrial units as well as the supporting services. Today, 5 units of water engineering and transport, 4 units of industrial architecture and 2 support service units remain in relatively good condition.

As mentioned above, throughout its history Gdańsk was an important fortress – modernised and rebuilt time and time again. That is why there are many military buildings located in the city that present a full overview of military thinking from the early Middle Ages to the 1940s.This gives a special character to the city. Most of these complexes are registered as historical heritage.

An important element is archaeological research. Gdańsk has 540 archaeological sites, out of which 378 have been positively located and 162 not (they are known only from archives and literature on the subject).

8.10 SUMMARY OF NATURAL CONDITIONS

Summarising the natural characteristics of the city, it can be said that today's spatial development of Gdańsk has several characteristics. The more important as regards the development of water supplies and the sewage system are:

- strongly diversified physical and geographical areas in the city (Pojezierze Kaszubskie, Pobrzeże Kszubskie, Żuławy Wiślane and Mierzeja Wiślana), each of which has specific characteristics and create conditions or environmental limits for city development;
- specific hydrological conditions resulting from the city being situated on the Baltic Sea coast and the Wisła estuary, where the risk of flooding from Wisła, Motława, Radunia and the sea are significant;
- a large area of biologically diverse and natural habitats, mostly due to forested areas, (considerably reduced due to developments) and a coastal zone (criss-crossed and cut and weakly forested sand-drifts), but with significant restrictions due to the lack of connection between the main natural structures;
- a considerable amount of protected areas (Tricity Landscape Park, nature reserves, areas of protected landscape, ecological utilities, nature and landscape units, extraordinary natural and ecological sites, including protected Natura 2000 sites);
- As for the state of the surface water and sewage it is necessary to mention:
- micro-biological pollution of the water exceeds the norms in most of the water courses and with a high concentration of biogenic substances (mainly phosphorus and nitrogen compounds) and general suspended solids;
- considerable changes in the trophic structure of the marine ecosystems resulting from deterioration of water quality. This causes eutrophication and loss of phyto and zooplankton biomass;

- a reduction in the pollution load from wastewater treatment plants discharged by the rivers into the Baltic Sea and consequent improved water quality;
- a related steady improvement in the sanitary conditions of the water in sea resorts and their consequent opening to the public.

9. IMPACT IDENTIFICATION AND ASSESSMENT

This section focuses on the impact identification, definitions of key terms, and the main criteria used to determine the significance and magnitude of impacts for various environmental topics.

9.1 METHODOLOGY

9.1.1 Impact Identification Methodoloy

The process of impact identification has been based on the identification of the activities/aspects of the project and the environmental components, which could be affected by those activities/aspects.

The identification of the impacts that are most likely to be significant involves the following steps:

- Identification of the project actions which are likely to have a significant impact on an environmental component.
- Identification of the environmental components that might be significantly affected by the project, either directly or indirectly.

The well-known Leopold matrix has been developed to enable the identification of issues in a consistent and robust manner.

The "y" axis of the matrix consists of a list of project activities and sub-activities, presented according to two phases: construction and operation. The "x" axis consists of a list of environmental components susceptible to impacts.

An action likely to have an impact on an environmental component has been identified by filling the box at their intersection in the matrix.

In applying the matrix, each project activity was examined to firstly find out which of the aspects were relevant and, if so, whether they would be large or small in magnitude. Secondly, to identify which environmental components and receptors could potentially be affected by each activity.

In order to get a better understanding, the following terms have been defined and used:

A phase is a series of related activities. Together, the activities form a distinct stage in the life of each asset. Two phases have been considered in this EIA:

- Construction
- Operation

An activity is a particular action, which is necessary as part of one of the phases. In some cases, an activity may consist of a series of subsidiary sub-activities.

An aspect is an element of an activity that will, or has the potential to, lead to an environmental impact.

Environmental resources are those elements of the environment that are essential to, or a value to, the functioning of a natural or human system. These include areas or elements of ecological, landscape, agricultural, cultural values, soil, air, surface water and groundwater, fauna, vegetation, cultural assets, etc..

An environmental impact is an environmental change that occurs as a consequence of an activity.

9.1.2 Impact Assessment Methodology

Once the impacts have been identified, the next step is to ascertain their significance and their magnitude.

9.1.2.1 Impact Significance

For defining the impact significance, the following definitions have been applied to this EIA:

- Positive (+)
- Negative (-)
- Direct: impacts that result from a direct interaction between an activity/aspect and the receiving environment.
- Indirect: Impacts on the environment, which are not a direct result of the project, often produced away from or as a result of a complex pathway. Sometimes referred to as second or third level impacts, or secondary impacts.
- Cumulative (C): impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.
- Synergistic (S): where two impacts interact together to create an impact that is greater than the sum of their parts.
- Permanent (P): impacts that occur once the development of the project has been carried out and causes a permanent change in the affected receptor or resource.
- Temporal (T): impacts that are predicted to last only for a limited known period.
- Resilient (R): the impacted environmental element has tendency to persist even with the application of mitigation measures.
- Recoverable (Rc): the impacted environmental element is likely to return to conditions similar to the previous conditions by applying mitigation measures.

- Reversible (Rv): the impacted environmental element is able to return to previous conditions either alone or by applying mitigation measures.

Impact significance will be assessed taken into account the above mentioned features.

SIGNIFICANCE	
Positive/negative	**(+)/(-)**
Direct/Indirect	**(3)/(1)**
Synergestic/Cumulative/Simple	**(3)/(2)/(1)**
Permanent/ Temporal	**(3)/(1)**
Resilient/Recoverable/Reversible	**(3)/(2)/(1)**

The significance of the impact will be classified as:

4-6	**7-9**	**10-12**
Low	**Medium**	**High**

9.1.2.2 Impact Magnitude

The magnitude of an impact may be calculated by Quantitative or Qualitative Assessment Methods. Methods for baseline measurement, and predicting and evaluating the magnitude of different environmental impacts cover a spectrum ranging from those that are quantitative in nature, to those that are qualitative. The term "quantitative" is used in the sense of anything that is capable of being measured or expressed numerically. The term "qualitative" is used in the sense of anything that requires a subjective description. In the EIA process, qualitative approaches normally involve an expert opinion to predict an impact and evaluate it. Even within a given impact topic, there may be a range of appropriate approaches with, for example, baseline measurements being made with a quantitative approach and prediction and evaluation being made with a qualitative approach. Progressing through the baseline, prediction, and evaluation sequence normally leads to more qualitative approaches.

Impact magnitudes for this project will be classified as low, medium and high.

Finally, the value of the impact will be the result of its significance as well as its magnitude, and it will be defined as follows:

- Low (compatible) impact. It refers to impacts on environmental resources of low quality, with little possibility of recovery; or on environmental resources of medium quality, with possibility of an easy recovery; or even impacts of a small magnitude on environmental resources of high quality, when recovery or reversibility is immediate and does not need mitigation measures.
- Medium (moderate) impact. It refers to impacts of a large magnitude on environmental resources of medium quality, with possibility of mid term recovery; or on environmental resources of high quality, with immediate recovery. Also included in this category are impacts of a small magnitude on environmental resources of medium quality, when they are irreversible, or on environmental resources of high quality, when they are reversible in the medium or long term without the need of mitigation measures.
- High (severe) impact: It refers to impacts of a large magnitude on environmental resources of high quality, with possibility of mid term recovery; or impacts of a large magnitude on environmental resources of medium quality without possibility of recovery. Also included in this category are impacts of a small magnitude on environmental resources of high quality without possibility of recovery. In all these cases mitigation measures are needed.
- Critical: It refers to impacts where the magnitude exceeds acceptable thresholds and it causes a permanent loss of the high quality of the environmental resource, without the possibility of a recovery, even applying mitigation measures.

An aim of the EIA is to get to a position where the project does not have any major negative residual impacts, neither to endure into the long-term, or extend over a large area.

For positive effects, the impact on each environmental factor has been directly assessed by a panel of experts using the following scale of importance values:

- +3 high positive impact
- +2 medium positive impact
- +1 low negative impact

9.2 IMPACT IDENTIFICATION

This section describes the project actions which are likely to cause an environmental impact and the environmental components affected.

9.2.1 Project Actions

The following table summarizes the project actions to be considered as well as in which of the task are involved.

Project Actions likely to have an impact on the environment				
Construction Phase	**WATER SUPPLY SYSTEM**			
	Pipeline networks	Trenching	Earth moving and clearance of vegetation; Access roads; Construction camp; Temporary land taking.	Tasks 02, 03, 04, 05, 06, 08, 10, 11, 12, 17
	Pumping stations, reservoirs and water treatment stations	Technical infrastructure; Storage reservoir/tanks	Earth moving and clearance of vegetation; Access roads; Construction camp; Waste generation; Permanent land taking.	Tasks 02, 03, 05, 07, 09, 10, 13, 14, 15, 16, 17
	WASTEWATER SYSTEM			
	Sewage network and storm water system	Trenching	Earth moving and clearance of vegetation; Access roads; Construction camp; Temporary land taking.	Tasks 19, 20, 21, 22, 23, 24, 25, 26, 27, 18
	Pumping stations and Wastewater Treatment Plant	Technical infrastructure	Earth moving and clearance of vegetation; Access roads; Construction camp; Waste generation; Permanent land taking.	Task 19, 21, 23, 24, 25, 26, 27, 28
	Demolition of decommissioned objects of Zaspa WWTP		Earth moving; Construction camp; Waste generation (asbestos); Temporary land taking.	Task 18
Operation Phase	**WATER SUPPLY SYSTEM**			
	Pumping stations, reservoirs and water treatment stations	Presence of buildings, reservoirs, banks.	Permanent land taking;	Tasks 02, 03, 05, 07, 09, 10, 13, 14, 15, 16, 17
	Drinking water system	Presence and operation of water pipelines	Ring layout of drinking water system	Tasks 01 to 17
	WASTEWATER SYSTEM			
	Wastewater Treatment Plant Station	Building presence and operation	Permanent land taking; Odours; Noise; Effluent.	Task 28
	Wastewater sewage system	Presence and operation of wastewater pipelines	Elimination of cesspools	Tasks 19 to 27

9.2.2 Environmental Components

This section describes those environmental resources/receptors susceptible to be impacted.

Environmental components	Effects
ATMOSPHERE	Air quality affection
SOIL	Soil quality alteration
HYDROLOGY	Inland water surface quality affection
HYDROGEOLOGY	Groundwater quality affection
FLORA	Loss of vegetation
FAUNA	Loss of habitat Disturbance to populations
PROTECTED AREAS	Loss of habitat within the protected areas
LANDSCAPE	Visible changes in the landscape
HERITAGE AND HISTORIC RESOURCES	Damage to historical/archaeological objects
HUMAN RESOURCES	Annoying odours, noise and disturbance of routine life activities Improvement of conditions of seaside resorts, water supply system rationalization, revitalization of degraded areas, city development

A matrix showing the cumulative impacts of all the tasks is shown at the end of the chapter.

9.3 ASSESSMENT OF ENVIRONMENTAL IMPACTS

This analysis will be performed considering the two phases of a project: construction and operation. The negative impacts have been assessed independently of positive impacts, which are addressed in a separate section.

9.3.1 Construction Phase

9.3.1.1 Atmosphere

The project includes a number of air emission of several sources of different nature and varying sizes, and sensitive receptors.

Impacts on air quality

Construction activities will involve the use of machinery and vehicles that produce combustion gas emissions (CO, NOx, HC), which affect to air quality. Earth movements during levelling, excavation, and hauling may generate dust emissions, specially during dry weather periods. These, however, are short term affections, which can be minimized by putting into place good environmental practices such as watering of unpaved work site surfaces and access roads, appropriate technical maintenance of machine and vehicles, use of tarpaulins, washing mud away from truck wheels, etc. The impact may be then considered as non significant and, therefore, neither significance nor magnitude are assessed.

Impacts on noise levels

Noise and vibrations will be generated during construction as a result of the operation of heavy construction machinery and transport vehicles. Generally, construction noise exceeding a noise level of 70 decibels has significant impact on surrounding sensitive receivers within 50 metres of the construction site. However, with the application of mitigation measures such as imposing speed limits to construction vehicles, traffic regulation, adequate technical maintenance, etc., this short term affection can be considered as non significant.

9.3.1.2 Geology

The main impact on geology that may occur during the construction phase implies geomorphological changes due to the creation of artificial talus or banks in areas where buildings and other infrastructures are built in a steep slope of the terrain. These geomorphological changes could eventually cause stability problems in terrain (i.e. sliding risks).

This impact has been considered as significant and has been assessed for significance, magnitude and impact value.

SIGNIFICANCE: Geomorphological changes	
Positive/negative	**(-)**
Direct/Indirect	**Direct (3)**
Synergistic/Cumulative/Simple	**Simple (1)**
Permanent/Temporal	**Permanent (3)**
Resilient/Recoverable/Reversible	**Recoverable(2)**

Significance = 9 = medium

Magnitude will be evaluated as follows:

High	Medium	Low
More than 70% of the projects with risk of geomorphological changes	40-70% of the project tasks with risk of geomorphological changes	Less than 40% of the project tasks with risk of geomorphological changes

Only tasks 10, 13, 27 and 16 are located in areas of steep slopes, where geomorphologic changes could cause stability problems. However, the geotechnical studies routinely performed for the engineering design of the structures take into consideration the necessary corrective construction measures to avoid stability problems. Also, task 26, for which an EIA was required, it has been requested that methods for preventing earth sliding are analyzed regarding topographic features.

Therefore, the magnitude of this impact is assessed as low.

The impact is assessed as low (compatible).

9.3.1.3 Soil

Soil impacts will be generated in those areas where either pipe network or the building construction works are located in unpaved areas. Main soil alterations include:

- soil compaction, particularly in construction camps located on unpaved areas, unpaved temporary access roads and manoeuvring areas due to the weight of the heavy machinery and trucks,
- loss of soil due to removal during digging and levelling activities,
- erosion processes while the ground is devoid of vegetation.

This impact, during the construction phase, has been considered as not significant since with the application of preventive measures regarding topsoil management (selective removal of top soil, landmarking/fencing, use of exiting interim roads, etc. soil erosion impact due to losses should be minor, as it can be considered that soil loss occur at the same rate as soil formation.

9.3.1.4 Surface water

The significance of any potential impact on surface water resource will depend on the present use of the resource or its importance to ecology, together with the nature and magnitude of change caused by the project.

Impacts to surface water resources considered in this project include the affection to water quality and physical disturbance of the water course. The assessment of impact on water quality is based on compliance with relevant standards for effluent discharges and that of water course disturbance on the avoidance of the aquatic ecological impact.

Water quality affections during construction phase would arise from such activities as planned discharges of groundwater removed from the trenches, treated wastewater and run off from the construction camp and other construction work sites, and pollution resulting from accidental spillages or leaks. These sources of pollution would introduce mainly suspended particles, and to a minor extent grease and fuels from machinery and vehicles.

The impact on surface water quality during construction has not been considered significant as the main contaminant will be suspended particles, and rapid dilution and sedimentation will allow to achieve levels where no discernible impacts are likely. However, in order to get this result, standard mitigation measures practices outlined in this EIA report will be required, specially for the following water courses, which have been classified as clean water courses: Jelitkowski Stream, Rynarzewski Stream, Radunia, and the Radunia Channel. The requirement for a clean effluent will also apply to discharges to the slightly polluted water courses of the Motława river, Czarna Łacha, and Strzyża. Effluent quality discharge limits will have to comply with legal water quality standards.

Tasks 04, 06, 08, 12, 18, 23, 26, 27 and 28 cross rivers, streams or melioration trenches (small, hardly structured, largely straight artificial streams), and, therefore, disturbance of the water course will take place through physical works where there is a need for crossing the water course.

This impact has been considered as significant and has been assessed for significance, magnitude and impact value.

SIGNIFICANCE: Water course disturbance	
Positive/negative	**(-)**
Direct/Indirect	**Direct (3)**
Synergistic/Cumulative/Simple	**Simple (1)**
Permanent/Temporal	**Temporal (1)**
Resilient/Recoverable/Reversible	**Reversible (1)**

Significance = 6 = low

Magnitude will be evaluated as follows:

High	Medium	Low
More than 70% of the project tasks affect water bodies, long term affection and/or extends over 500 metres.	40-70% of the project tasks, short term affection and/or extends between 100 and 500 metres.	Less than 40% of the project tasks affect water bodies, short term and/or limited to the immediate area (within 100 m) of the work site.

The magnitude of this impact is assessed as low since in all cases where water bodies will need to be crossed, the affection will be short and limited to the width of the pass.

The impact is assessed as low (compatible). Preventive measures will be taken, nonetheless, for not invading the banks and beds of the water.

Special mention requires task 06, as the pipeline in the Motlawa river will be crossed underneath.

9.3.1.5 Hydrogeology

The vulnerability of aquifers with regards to surface contamination depends to a great extent on the geological features of the materials overlying the aquifer. However, if contamination reaches a well protected aquifer, its regeneration will be most likely slow and difficult. The significance of impacts to groundwater can be based on a combination of the quality of the resource and the scale of the impact risk to it.

The project area comprises two aquifers. In the tertiary level natural processes are stable. The pollution of the cretaceous waters by surface activity is unlikely because of the existence of limestone layers, loams and clay isolating the cretaceous sands from external influences. Nonetheless, there is possibly local degradation of cretaceous waters, especially in places where old, unused wells are located, or where wells were abandoned without the proper technical considerations to isolate the water-bearing levels.

Groundwater from the upper Quaternary aquifer in the project area, however, is vulnerable to contamination and does not have an stable quality. In the coastal terrace, the structure of the terrain with small slopes and sands favour the infiltration of precipitation and the associated leaching of pollutants from the surface to the lower layers of the Quaternary formation. The clear indicator of the threat is an increased concentration of nitrogen compounds in 'Czarny Dwór' and 'Zaspa' intakes caused by, seemingly harmless, horticultural activity in direct neighbourhood of these intakes.

Impact to groundwater quality of the Quaternary aquifer has been considered important in the context of existing impacts, and mainly considering the one of the aims of the project, improving drinking water supply

Groundwater pollution could take place during construction activities such as:

- Excavation activities. A high groundwater level is expected in most of the areas where pipelines will be installed. Groundwater will be removed from the trenches to allow the installation of the pipelines. Although this water removal minimises the potential for groundwater contamination, contamination may still occur in inactive open trenches when run off from surrounding ground enters the trench. Other excavation works may be necessary for the installation of infrastructure (i.e. pumping stations), where the entrance of contaminants could occur.
- Construction camps. In particular, the camp areas allocated for parking, storage, and maintenance of vehicles and machinery. Spills and contaminated runoff (with fuel, oils and greases) from these areas could enter the soil and lixiviate into the upper unconfined Quaternary aquifer.

The potential contamination of the aquifer during the construction of wells has also been considered, but nowadays this possibility is minimal. Drilling equipment and techniques, especially for a drinking water well, ought to be clean and free of any contamination.

SIGNIFICANCE: Groundwater quality alteration	
Positive/negative	**(-)**
Direct/Indirect	**Direct (3)**
Synergistic/Cumulative/Simple	**Cumulative(2)**
Permanent/Temporal	**Permanent (3)**
Resilient/Recoverable/Reversible	**Resilient (3)**

Significance = 11 = high

Magnitude is assessed with the following parameters:

High	Medium	Low
More than 70% of the project tasks located over high aquifer vulnerability areas, potential pollutants have a high solubility in water, potential sources are large and over a long period of time, and/or depth to groundwater is less than 2 meters.	40-70% of the project tasks located over high aquifer vulnerability areas, potential pollutants have a medium solubility in water, potential sources are of a medium size and mid term, and/or depth to groundwater is 2 to 10 meters.	Less than 40% of the project tasks located over high aquifer vulnerability areas, potential pollutants have a low solubility in water, potential sources are of a small size and short duration, and/or depth to groundwater is more than 10 meters.

Magnitude has been based on the following assessment of the parameters:

- Pollutant lixiviation likeliness. Most likely contaminants will be fuel, oil and greases from vehicles and machinery. Unless a spill or leak occur that enter directly into the ground, these contaminants are lighter than water and therefore will tend to be wash out with surface run off; only dissolved hydrocarbons would enter the soil.
- Intensity and duration. If spills or leaks occur, in these would be expected to be small and immediately removed. As for contamination carried in water run off, this would only be expected to be relatively high in areas with intense traffic. The exposure time should not be long, as the excavated sites are covered as the pipeline (or any other infrastructure) is installed.
- Depth to groundwater. The groundwater table of the Quaternary aquifer is quite shallow in the project area (often less than 2 meters).
- Number of tasks located above high groundwater vulnerability areas. Tasks 06, 09, 12, 23, 24, part of task 26 and 27 are located over the protected quaternary aquifer, and thus over a high sensitivity area and within a protected area.

The magnitude of the impact is assessed as medium-low. Distance to groundwater is quite short, however, contaminant lixivation, intensity and duration are low. Approximately 25% of the project tasks are over the aquifer vulnerability area.

The impact value, considering the significance and the magnitude is medium (moderate).

9.3.1.6 Flora

Construction will result in the removal of trees, shrubs and other vegetation along the pipelines routes, the pumping station land lots, and the water and wastewater treatment station sites. Other

agents that may deteriorate vegetation in the vicinity of the construction site are dust from excavation and earth movements, accidental hits by heavy machinery or vehicles, and dryness when naked roots are exposed.

The significance of this impact has been assessed as follows.

SIGNIFICANCE: Vegetation clearance	
Positive/negative	**(-)**
Direct/Indirect	**Direct (3)**
Synergistic/Cumulative/Simple	**Simple (1)**
Permanent/Temporal	**Permanent (3)**
Resilient/Recoverable/Reversible	**Recoverable (2)**

Significance = 9 = medium

Magnitude has been evaluated on the basis of the quality of the vegetation affected and the percentage of each quality type affected, as follows:

High	**Medium**	**Low**
More than 80% of the vegetation affected by the project tasks consists of wood lands of beech, birch, fir or other species.	30-80% of the vegetation affected by the project tasks consists of wood lands of beech, birch, fir or other species, or 80% or more of the affected vegetation consists of pastures.	Less than 30% of the vegetation affected by the project tasks consists of wood lands of beech, birch, fir or other species, or less than 80% of the affected vegetation consists of pastures.

In order to determine the percentage of affected vegetation, the surface of each of the types of vegetation present in the areas affected by the project tasks has been calculated. For this, a stripe of 15 meters at the sides of the pipeline paths and around the perimeter of the pumping stations, water treatment plants, and wastewater treatment plants has been taken. This is, the affection surface selected pertains both direct removal of vegetation as well as potential deterioration of vegetation in the immediate vicinity of the works. The results, in square meters of vegetation surface affected, are shown in the following table.

	Vegetation affected (m^2)					
	Cultivated land	**Pastures**	**Beech**	**Birch**	**Fir**	**Other forested areas**
WWTP, WTP, PS						
Task 02	1.672,20					
Task 03	21.249,03		1.314,84			
Task 05	800,68	27.366,35				
Task 09	264,91	15.141,93				
Task 10	0,00	22,14	9.950,65	767,46		
Task 13			13.374,59			
Task 14	6.985,03					
Task 15	4.906,20					
Task 16	2.888,01	33.384,96				
Task 18	84.386,48	132.261,08				14.208,42
Task 19	4.093,99					
Task 26	141,23	4.311,19			1.710,33	
Task 28	67.517,03	178.506,62			11.802,54	
CONDUCTIONS						
Task 02	20.690,66	18.646,63	71,17	2.364,57	0,00	
Task 03	30.030,51	11.030,51	0,00	137,16	0,00	
Task 04	236.138,63	120.640,30	22.646,70	6.215,55	6.284,75	
Task 05	54.286,11	67.460,55				
Task 06	15.626,07	39.096,33				646,89
Task 08	32.101,44	5.082,46				2.277,42
Task 10	0,00	29.548,85	28.025,89	1.875,44		
Task 11	16.631,96	16.694,96	153,51	1.220,72	538,95	
Task 12	10.521,99	63.559,03				
Task 13	0,00	80,74	9.354,78	498,21		
Task 14	8.766,07	0,00				
Task 17	0,00	2.753,54				
Task 18	67.169,03	96.993,43				906,93
Task 19	333.120,23	172.938,75	15.205,43		130,29	
Task 20	0,00	4.730,83				
Task 21	6.662,59	8.543,94				
Task 22	5.793,08	22.264,66				519,96
Task 23	79.776,92	49.578,49				338,92
Task 24	2.987,68	51.961,75				
Task 25	11.976,87	71.817,62				
Task 26	19.093,34	72.074,05	6.557,03	665,40	7.495,73	2.896,23
Task 27	23.719,95	63.645,96		809,49		2.689,09
TOTAL	**1.201.187,59**	**1.380.137,65**	**106.654,59**	**14.554,00**	**27.962,59**	**24.483,86**
Percentage	**43,60**	**50,10**	**3,87**	**0,53**	**1,01**	**0,89**

The vast majority (93,70%) of the vegetation affected by the project tasks, excluding built up areas, is either cultivated land or pastures, the forested areas representing only 6,30% of the total affected vegetation. Taking into account only pastures and cultivated land, slightly more pastures are affected than cultivated land (53,47%). It has to take into account too, in assessing the magnitude of the impact, that many of the tasks go through paved areas, without vegetation cover.

The magnitude of the impact is then low.

The impact is assessed as low (compatible).

9.3.1.7 Fauna

Construction activities are known to affect the fauna. Animals respond to noise pollution caused by construction: they alter their activity patterns, and heart rates and production of stress hormones increases; birds and other animals that communicate by auditory signals may be affected by construction noise; some species of animals show abnormal reproductive behaviour in response to noise.

Construction activities also eliminate animals and plants directly and may limit long-term sight productivity for some species by exposing low nutrient subsoils, reducing soil water holding capacity, and compacting surface materials. Birds suffer temporary or permanent habitat loss, fragmentation of feeding, breeding and roosting areas, as well as migratory routes due to barrier effect or change of food species availability.

During construction phase, fauna may also be exposed to high levels of dust due to excavation, earth moving, site preparation and traffic through interim access roads.

The significance of the impact on fauna is assessed as follows:

SIGNIFICANCE: Fauna disturbance	
Positive/negative	**(-)**
Direct/Indirect	**Direct (3)**
Synergistic/Cumulative/Simple	**Cumulative (2)**
Permanent/Temporal	**Temporal (1)**
Resilient/Recoverable/Reversible	**Reversible (1)**

Significance = 7 = medium

Magnitude is assessed with the following parameters:

High	Medium	Low
More than 70% of the project tasks located in areas with a high and diverse fauna, protected species or endangered species are present in the project area, affection will cause a decline in abundance of populations and/or change in distribution threatening their integrity.	40-70% of the project tasks located in areas with a high and diverse fauna, no protected species or endangered species are directly affected, but vulnerable or rare species or species with a commercial or hunting value are present, affection will cause some decline in abundance of populations and/or change in distribution without threatening their integrity.	Less than 40% of the project tasks located in areas with a high and diverse fauna, no protected, endangered, vulnerable, or rare species present, neither species with a commercial or hunting value, affection will cause an imperceptible decline in abundance of populations and/or change in distribution.

Magnitude has been based on the following assessment of the parameters:

- The fauna present within area where tasks 10, 13 and 23 are located, is rich and varied. The majority is associated with forest complexes where roe-deer, red deer, wild boar, fox, marten, weasel, hedgehog, or hare are present. There is also a range of smaller species, such as forest mouse, ginger vole, and mole. The bird communities are quite important in the area of Gdánsk, with rare birds breeding in forested complexes such as the Tri-city Landscape Park, or endangered species in the Vistula Estuary bird protection area PLB 220004. The ichthyofauna associated to different water bodies is also important; trout is abundant in clean fresh water courses.
- Only tasks 10 and 13 are completely located within forested areas. The pipeline path of task 04 crosses a small wood, and runs along the boundary of several woods as do the pipeline paths of tasks 23, 19 and 11. Finally, part of the pipeline path for task 23 runs along the limit of the special bird protection area PLB 220004 Ujscie Wisly (Vistual Estuary). The rest of the projects are situated mainly in urban areas or rural areas with pastures or cultivated land, where fauna is less rich and diverse.
- The spatial and temporal extent of the construction activities is reduced; they may cause the destruction of a limited number of localised individuals within a population over a short time period (less than one generation) and a transitory displacement of populations, without this affecting the abundance or distribution of the populations present in the project area.

The magnitude of the impact is assessed as medium.

Therefore, this impact is assessed as medium (moderate).

9.3.1.8 Protected Areas

This impact refers to affections to areas that are protected due to their ecological values. Some of the tasks of the project happen to be situated in or near protected areas, including Natura 2000 network sites. Protected areas can be affected if there is temporal or permanent land taken, implying a loss of ecological values. Traffic and access roads could also affect them.

The significance of this impact has been assessed as follows

SIGNIFICANCE: Protected Areas	
Positive/negative	**(-)**
Direct/Indirect	**Direct (3)**
Synergistic/Cumulative/Simple	**Simple (1)**
Permanent/Temporal	**Permanent (3)**
Resilient/Recoverable/Reversible	**Reversible (1)**

Significance = 8 = medium

Magnitude is assessed taking into account the extent of land taken:

High	**Medium**	**Low**
Project tasks affect more than 10% of the total protected area.	Project tasks affection is between 5% and 10% of the total protected area.	Project tasks affect less than 5% of the total protected area.

Tasks 10 and 13 are located inside the Tri-city Landscape Park (Trójmiejski Park rajobrazowy) and task 16, although outside Natural Landscape Protected Area of the Valley of the Orunia Stream (Dolina Potoku Oruńskiego), it surrounded by this area in 3 of the 4 sides of the property.

Task 13 will implies the re-construction of an already existing reservoir and therefore the surface affection will be reduced to the required access roads needed for reaching the site, which is very close to the limits of the park.

Task 10 is also within this protected area, although is located further away from the boundary of the park. A pumping station and two new reservoirs will be installed. This protected area of land is especially dedicated to the protection and maintenance of biological diversity. Habitat diversity is high, including protected species (regarding vascular plants, 86 rare and 22 endangered species at the national level can be mentioned, as well as 10 fungi species strictly protected). Rare birds species breed in this park too.

The surface affection for these tasks has been estimated in 69.020 m^2. This corresponds to less than 1% of the total surface of the park.

Task 16 implies the construction of a pumping station and two water reservoirs. The surface affection of this task has been estimated in 36.273 m^2, of which a significant part where the facilities will be built, are pasture land. Task 16 will not imply any direct land taking of the protected area because it is outside its limits, but is, nonetheless, very close to it and some disturbance to the natural values is expected.

In addition, it should be considered that Task 23 has approximately 2,6 km of pipeline running along the boundary of Natura 2000 site PLB 220004 Ujscie Wisly. This will not imply any land taken of this bird important area. Nonetheless, some nuisance to the fauna inhabiting this protected area is not discarded during construction works.

The magnitude of the impact on protected areas is medium.

The impact is assessed as medium (moderate).

9.3.1.9 Cultural Heritage

The cultural heritage comprises a wide and varied set of historical and cultural goods, whose conservation may be directly or indirectly affected by the construction works. Thus, the construction activities that could generate an impact on the cultural heritage are those implying excavation or other types of earth movements, since they could destroy buried archaeological remains.

This impact depends on the size and location of the construction sites, and on the know or suspected archaeological richness of the area.

As described in the Environmental Baseline chapter of this EIA study and shown in maps on Cultural Heritage, the project area has a high valuable cultural heritage.
The significance of this impact has been assessed as follows:

SIGNIFICANCE: Cultural Heritage	
Positive/negative	**(-)**
Direct/Indirect	**Direct (3)**
Synergistic/Cumulative/Simple	**Cumulative (2)**
Permanent/Temporal	**Permanent (3)**
Resilient/Recoverable/Reversible	**Recoverable (2)**

Significance = 10 = high

Magnitude will be evaluated as follows:

High	Medium	Low
More than 70% of the project tasks affecting areas or objects protected because of their cultural values.	40-70% of the project tasks affecting areas or objects protected because of their cultural values.	Less than 40% of the project tasks affecting areas or objects protected because of their cultural values.

Tasks 06, 10, 18, and 27 are located in areas classified as cultural heritage sites. Task 27 crosses the Channel of Radunia river, which is registered as historical monument and also affects to the suburban rural complex of Sw, Wojciech, protected by the Voivodship Cultural Heritage Conservator. Besides, these protected area is under archaeological observation.

Task 21 is reported to cross an archaeological protected area.

The pipeline path of task 02 crosses an area of ancestral houses. Construction works will not affect any of the existing houses.

Part of tasks 03, 04, 14, 22, 23, 27 are located in areas classified as having a rural heritage.

Tasks 12, 18, 24, and 25 are located in areas classified as having a urban heritage.

Tasks 04 crosses a train railroad having an industrial infrastructure heritage. Task 23 is located inside an area classified as having an industrial infrastructure heritage.

In addition, it has to be considered that Gdánsk is a one thousand years old city, which has played a major role in the commercial relationships between Northern and Western Europe as well as the

countries of Central and Eastern Europe, and therefore has been a melting pot of cultures and ethnical groups whose presence may show up anywhere as an archaeological evidence.

Since many of the project tasks (approximately 60%) affect areas with cultural values and because of the historical background of the City of Gdánsk, the magnitude of the impact has been considered as medium.

The impact has been assessed as medium (moderate).

9.3.1.10 Landscape

The landscape of Gdánsk is one important feature, highly valued by its inhabitants. This is reflected in the fact that many areas of the city and its surroundings are protected on the basis of their landscape values.

Landscape alteration is an impact, which will start during the construction phase, and, in some cases, will continue during the operational phase of the project. A considerable number of tasks affect areas of high landscape values where the altered landscape will remain after construction works are completed.

During construction, the magnitude of this impact will depend on the quality and fragility of the landscape affected and on the spatial and temporal extent of the construction activities, specially those involving excavation and earth movements. Because construction activities will not be carried out at the same time for all the projects, and, for each task, the construction period will be relatively short and the land surface excavated relatively small, and for most of the tasks, the landscape will return to its original conditions with adequate reinstatement measures, this impact will be considered non significant during the construction phase. It will be assessed, nonetheless, in the operational phase, for there are tasks where morphological changes of the terrain and/or installation of aboveground structures imply a permanent alteration of the landscape.

9.3.1.11 Other Impacts during Construction Phase

Hazardous waste management: asbestos waste

Task 18 involves, among other activities, the demolition of the decommissioned objects of the Zaspa sewage plant. This plant was built in the thirties and, therefore, there is a high likelihood, asbestos was used in construction materials. In fact, asbestos cement pipes in the Gdańsk sewerage system are quite widespread. Gdánsk street sewers (without including house connections) comprise the following materials, including asbestos:

- Cast iron 19.1 km.
- Steel 1.3 km.

- Concrete 68.3 km.
- Brick 17.2 km.
- PVC 59.4 km.
- PE 0.3 km.
- Asbestos cement 0.6 km
- Stoneware 471.9 km.

Removal of asbestos cement pipes as well as roof made of asbestos may negatively impact the environment and particularly the health of workers if adequate safety measures are not applied. The need to take such safety measures is strictly regulated by EU Directives and Polish legislation. Of particular importance will be the application of the following EU Directives:

- Directive 83/477 (amended by Directive 2003/18) on the protection of workers against the risks from exposure to asbestos. This Directive requires employers to assess the risk to workers of any exposure and to take preventive measures. It prohibits the application of asbestos by spraying, establishing maximum exposure limit values.
- 2003/33/EC Council Decision of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC. Article 2.3.3. on Asbestos waste states the following:

  Construction materials containing asbestos and other suitable asbestos waste may be landfilled at landfills for non-hazardous waste in accordance with Article 6(c)(iii) of the Landfill Directive without testing.

  For landfills receiving construction materials containing asbestos and other suitable asbestos waste, the following requirements must be fulfilled:

  - the waste contains no other hazardous substances than bound asbestos, including fibres bound by a binding agent or packed in plastic,

  - the landfill accepts only construction material containing asbestos and other suitable asbestos waste. These wastes may also be landfilled in a separate cell of a landfill for non-hazardous waste, if the cell is sufficiently self-contained,

  - in order to avoid dispersion of fibres, the zone of deposit is covered daily and before each compacting operation with appropriate material and, if the waste is not packed, it is regularly sprinkled,

  - a final top cover is put on the landfill/cell in order to avoid the dispersion of fibres,

  - no works are carried out on the landfill/cell that could lead to a release of fibres (e.g. drilling of holes),
  - after closure, a plan is kept of the location of the landfill/cell indicating that asbestos wastes have been deposited,

  - appropriate measures are taken to limit the possible uses of the land after closure of the landfill in order to avoid human contact with the waste.

For landfills receiving only construction material containing asbestos, the requirements set out in Annex I, point 3.2 and 3.3 of the Landfill Directive can be reduced, if the above requirements are fulfilled.

This impact shall be considered non significant, but safety measures set in regulations should be strictly followed.

Annoyance to residents by the presence of construction works

Another affection to be taken into account as a result of the construction works associated with any civil engineering project is the disturbance that the construction works cause to the neighbouring residents, both in urban and rural areas. Construction works in urban areas will likely imply traffic problems mainly due to streets cuts and traffic detours. In rural areas, the construction of pipelines passing through private properties may interfere with agricultural activities.

In order to minimise these annoyances, the construction works plan will need to take into account these aspects.

9.3.2 Operational Phase

Once operational, the whole project will have a major positive impact on the environment as it will allow a great improvement in surface/sea water quality. This improvement will be gradual through time according to the project implementation. Nevertheless, some environmental impacts have to be considered as follows:

9.3.2.1 Landscape

Impacts on landscape and visual amenity will potentially occur as a result of the operational phase (presence of buildings, reservoirs, and talus).

The significance of this impact has been assessed as follows:

SIGNIFICANCE: Landscape alterations	
Positive/negative	**(-)**
Direct/Indirect	**Direct (3)**
Synergistic/Cumulative/Simple	**Simple (1)**
Permanent/Temporal	**Permanent (3)**
Resilient/Recoverable/Reversible	**Recoverable (2)**

Significance = 9 = medium

The magnitude of the impact on landscape depends on the landscape sensitivity and the extent and duration of an effect.

Sensitivity is defined as the extent to which a landscape can accept a change of a particular type and scale without unacceptable adverse effects on its character. The sensitivity of the landscape depends on its inherent quality, its fragility; this is its capacity to accommodate changes, and the sensitivity of viewers.

Magnitude will be evaluated as follows:

High	Medium	Low
Project tasks affecting landscapes of a high scenic value, with introduction of substantial new features into the landscape or view of the site itself, or obstruction of a substantial part or important elements of views beyond de site.	Project tasks affecting landscapes of a high or medium scenic value with introduction of noticeable new features into the landscape or view of the site itself, or obstruction of a noticeable part or elements of view beyond de the site. Project tasks affecting landscapes of a medium or low scenic value, with introduction of substantial new features into the landscape or view of the site itself, or obstruction of a substantial part or important elements of views beyond de site. Project tasks affecting landscapes of high scenic values with small changes in the landscape or views.	Project tasks affecting landscapes of a low scenic value with introduction of noticeable new features into the landscape or view of the site itself, or obstruction of a noticeable part or elements of view beyond de the site. Project tasks affecting landscapes of medium or low scenic values with small changes in the landscape or views.

Several of the project tasks affect areas protected for their high landscape values. These are:

Tasks 10 and 13, located within the Tri-City Landscape Park;

Tasks 03, 04, 11, 17, and 18, located partially or entirely within the protection zone of the Tri-City Landscape Park;

Task 05, located within the Protected Landscape Area of the Delta of the Wisła River (OChK Żuław Gdańskich);

Task 23, located within the Protected Landscape Area of the Sobieszewska Island (OchK Wyspy Sobieszewskiej);

Task 16, is not located within the protected nature and landscape complex Valley of the Orunia Stream (Dolina Potoku Oruńskiego), but three out of the four sides of the property border the limits of the protected area;

Task 25, located in the vicinity of the Otomiński Protected Landscape Area.

Of these tasks, tasks 04, 11, 17, 23 and 25 mainly involve the laying of pipelines below ground level. Landscape in these tasks areas will be temporarily impaired during construction works, but after these are completed, with adequate revegetation measures, the landscape will return to its original conditions. The same can be said for task 13, which involves the recommissioning of an existing reservoir.

Task 10 involves the reconstruction of a water intake and a water treatment station, as well as the layout of pipelines, which could affect to the morphology of the banks of the river in this area.

Tasks 03 and 05 involve the construction and reconstruction, respectively, of a water treatment station, with the construction of new buildings. Task 17 involves, in addition to pipeline conductions, the construction of a new pumping station, and task 16 the construction of a pumping station and two reservoirs, outside the protected landscape area, but next to it. It is considered that the presence of these infrastructures during the operational phase will introduce noticeable new features into landscapes of high value, and therefore, the magnitude of the impact has been assessed as medium.

The impact has been assessed as medium (moderate).

9.3.2.2 Impacts from Odours

The operation of a wastewater treatment plant often results in the emission of odours offensive to plant personnel and the neighbouring community. Areas of the WWTP such as the bar racks, screens, settling tanks, aeration tanks, and sludge units are all potential sources of odours.

The significance of this impact has been assessed as follows:

SIGNIFICANCE: Odour nuisance	
Positive/negative	**(-)**
Direct/Indirect	**Direct (3)**
Synergistic/Cumulative/Simple	**Cumulative (2)**
Permanent/Intermittent/Temporal	**Intermitent (2)**
Resilient/Recoverable/Reversible	**Recoverable (2)**

Significance = 9 = medium

The magnitude of this impact depends on various factors, including the intensity of the odour, the dispersion conditions (which depend on atmospheric conditions and land morphology), and the number and sensibility of the receptors. For this assessment, the magnitude has been determined as follows:

High	Medium	Low
A populated area is at 1.000 m or less from the odour source and/or dwellings, schools or churches at 500 m or less from the odour source.	A populated area situated at a distance between 1.000 m and 2.000 m from the odour source and/or dwellings, schools or churches situated at a distance between 500 m and 1.000 m from the odour source.	A populated area is at more than 2.000 m from the odour source and/or dwellings, schools or churches at more than 1.000 m from the odour source.

The area immediately surrounding the Gdańsk Wschód wastewater treatment plant consists of industrial facilities, mainly represented by the Gdańsk refinery, at less than 500 m East of the current plant, some warehouses and office buildings, and agricultural land and pastures to the North, South and East. Several dwellings, however, are in the neighbourhood of the plant, at less than 500 m. The magnitude of this impact is assessed as high.

The impact is initially assessed as medium-high (severe). However, in assessing this impact it has to be taken into account that the project also involves the dismantling of the Zaspa wastewater treatment plant, currently affecting a densely populated area of the city of Gdańsk, which will be a positive effect, offsetting this negative impact. Also, it should be considered that the project involves

an upgrading of existing WWTP facilities and, therefore, an improvement of the efficiency of the wastewater treatment performance leading to a likely reduction of its aerosanitary and acoustic nuisances. The discontinuation of septic tanks and cesspools operations in those areas equipped with the new sewage system will also contribute to lessen the odour nuisances suffered by Gdańsk inhabitants.

9.3.2.3 Noise and Vibration

Noise and vibrations emissions from the performance of the pumping equipment in pumping stations as well as from the Wschód WWTP may be a potential impact to neighbouring residents. This impact is not considered as significant since the design of the new WWTP facilities and that of the stations, in most cases underground facilities, should incorporate the necessary noise and vibration abatement measures, which have been proven to be effective.

9.3.3 Description of Positive Impacts

The Gdánsk water and wastewater project has a significant number of actions which, during operation of the facilites, will have significant positive impacts. These impacts have been assessed in the EIA study entitled Environmental Impact Report of the Gdańsk - Wschód Wastewater Treatment Plant Extension, prepared within the context of the Gdańsk Water and Wastewater Project, by Ekokonsult in October of 2005.

9.3.3.1 Impact From Sludge Management

The option that has been selected for sludge management in this project is sludge drying combined with production of electricity. This option has the following environmental advantages:

- Odour impacts from granulated sludge are less likely than those of handling of dewatered sludge, specially if it has to be stored for prolonged periods on site.
- The mass of dried sludge to be transported is small and it will be transported in closed trunks, whereas large scale transport of dewatered sludge may pose and environmental risk.
- Burning the granulated sludge at the Heat and Power Company reduces the amount of coal burnt.
- Reduced imported electricity requirement at WWTP.

9.3.3.2 Impacts of Treated Effluent on Receiving Waters and Baltic Sea

There will be a significant reduction of the pollution loads (including phosphorus and nitrogen) discharged to the Baltic Sea from Gdańsk area after the closure of Zaspa WWTP and the modernization of Wschód WWTP. This will result in the fulfilment of Polish and EU binding standards, and will contribute to:

- Improved ecological status of waters and ecosystems directly depending on aquatic ecosystems (including Natura 2000 areas: Vistula Mouth and Pucka Bay)
- Improvement of the sanitary conditions of the beaches and bathing areas, which will increase the attractiveness of the coastal zone for recreation, enabling its proper use and development
- Prevention and elimination of the pollution of the Baltic Sea Area, i.e. to accomplish obligations of the Helsinki Convention

The anticipated reduction of pollution load discharges will be as follows:

- 31% of BOD_5 load
- 43% of COD load
- 34% of suspended solids load
- 40% of nitrogen load
- 76% of phosphorus load

No monitoring data or calibrated water quality models are available for predicting the exact impact on the water. However, it is estimated, that the above mentioned reduction will be achieved and this will have to be confirmed by putting a monitoring plan in place.

9.3.3.3 Impacts of Sewage Network

The project will improve the sanitary status of urban areas through the extension of the sewerage network into areas presently not served, and where disposal of wastewater is conducted in cesspools, septic tanks and even direct discharge in to water bodies. Thus, the extension of the sewerage network will eliminate the ground and groundwater contamination currently existing due to seepage from leaky holding tanks or emergency spillages.

The construction of a new sewer connecting the Ołowianka pumping station and the Wschód WWTP will minimize the risk of the serious breakdowns of the wastewater system both in the area of the city connected with the WWTP by a single collector as well as in the adjacent valuable nature areas of the NATURA 2000 network.

9.3.3.4 Impacts of Zaspa WWTP Decommissioning

The decommissioning of the obsolete Zaspa WWTP, located in a densely populated area of the city, will eliminate the nuisance and odour problems associated with the plant operation, septage collection and transportation of sewage. In addition, it will provide for the possibility of restoration and development of the area of the closed plant.

The diversion of the wastewater from the Zaspa WWTP catchment's area to the developed and modernized Gdańsk-Wsschód WWTP, will cause a significant reduction of pollutant loads discharged into the Bay of Gdańsk. A consequence of that will be further systematic improvement of the environmental quality of the coastal waters as well as the improvement of the quality of bathing waters in the city area.

9.3.3.5 Impacts of the Reorganization of the Water and Wastewater Management

The reorganization of the water and wastewater management in many districts of the city, together with the dismantling of the Zaspa WWTP, will give the municipality new areas for further development and enable the revitalization of the central and suburban areas of the city.

The rationalization of the use of groundwater resources will result in the improvement of drinking water supply, including the improvement of the reliability of a water supply meeting quality requirements.

Also, as a result of the groundwater level control and increased uptake, the planned groundwater abstraction system will likely result in the stabilization of groundwater levels in some areas of the lower terrace of the city, thus minimizing the flooding threat for the building structures.

The risk of sanitary and health threats as a result of water logging and floods in the area of the Gdańsk Lowlands (Żuławy Gdańskie) will be reduced as well, with the implementation of the water and wastewater management tasks to be performed in connection with the development of the Wschód WWTP.

9.3.4 Assessment of Positive Impacts

9.3.4.1 Surface Water Quality

It has been considered that all the wastewater tasks will have a positive impact on the quality of surface water, which has been assessed as low, medium, or high, depending on the size of the area that will be covered by the sewage system.

9.3.4.2 Groundwater Quality

It has been considered that all water supply tasks are neutral (do not have an effect) with regards to the improvement of the quality of groundwater, except for task 1 (building of a measuring and monitoring system for the Gdansk Water System), which has been assessed as having a low positive impact. This is because the implementation of task 1 will allow in the future to manage the groundwater use in such a way as to reduce pollution risks (for example, seawater intrusion).

All wastewater tasks will have a positive impact, its magnitude depending on its location (high positive impacts have been associated to those tasks located on the main groundwater aquifer (GZWP) No. 112), as well as on the size of area covered by the sewage system.

9.3.4.3 State of Seawaters and Seaside Resorts

All water supply tasks as well as those wastewater tasks that include the building of sewage network facilities in locations far away from the seashore are considered not have an effect on the quality conditions of the seawaters and seaside resorts. Those sewage network tasks closer to the shoreline have been considered to have a low positive impact, except for task 23 (Sobieszewska Island), which is located in the vicinity of the seashore in a sensitive area next to the Wisla river and its western delta arm, Martwa Wisla. For the Zaspa WWTP (task 18), the positive impact has been assessed as high because the sewage effluent from this plant will not longer be discharged into the sea. Finally, the WWTP "Wschód" has been considered to have a medium positive because, although it will receive the sewage that used to be processed at the Zaspa plant, the overall removal of pollutants is expected to improve significantly, thus discharging a wastewater effluent of a better quality.

9.3.4.4 Drinking Water Quality

All water supply tasks that concern the building of a new water treatment plant or the modernization of existing ones will have positive impacts.

9.3.4.5 Rationalization of the Water Supply System

All water supply tasks are aimed at fulfilling this objective and therefore have a positive impact. The importance of the impact has been assessed taking into account their contribution to the future Gdansk Water System (GWS). The highest values have been given to those tasks that are key to organize a whole GWS in the form of a ring. Task 1 has been considered to have a high positive impact as well since it will allow to supply water to the inhabitants based on the real consumption.

9.3.4.6 Spatial Development of the City

The execution of Gdansk water and wastewater project tasks will allow the city for spatial development by fitting new urban areas with water and sewage systems. Excluding tasks 1, 18 and 28, which are neutral, all tasks are likely to have a positive effect, its importance depending on the area covered.

9.3.4.7 Revitalization of Degraded Downtown and Suburban Areas

Within the Gdansk city there are districts with different life standards, some of which, i.e. Olszynka, Orunia, partly Sw. Wojciech, presently have poor social conditions. It is expected that the building of a new water and sewage system will be a strong stimulus for the revitalization process of these areas as

well as of the other areas benefited by the project. It has been considered that the tasks located within the mentioned districts will have a high positive impact. The rest of tasks are likely to have medium or low positive impacts, depending of the district living standards.

9.3.4.8 Minimization of Flood Problems

Parts of the city of Gdansk are located within areas that are periodically flooded by the naturally occurring raising of the Wisla river levels in winter. These floods often affect water intakes at "Lipce" and the WWTP "Wschod". The execution of some of the Project's tasks will reduce the potential negative results of flooding. Firstly, because the creation of the Gdansk Water System in the form of a ring will allow to supply water even when the water intake at "Lipce" will be flooded. Moreover, the modernization of the "Lipce" intake and the treatment plant will reduce the risk of water contamination during floods. For these reasons, most of the water supply tasks are likely to have a positive impacts whose importance depends on its position in the Gdansk Water System.

A second aspect to consider with regards to the problems generated by the floods is the minimization of water contamination risks as a result of the better sludge management which will be carried out after accomplishing the extension of the WWTP Wschod.

A negative impact could be identified for task 18 affecting the WWTP Zaspa, which is located in an area that is not endangered by floods. After task execution, all sewages from the WWTP Zaspa catchment's area will be diverted to the WWTP Wschod, and this would increase the contamination risk since this area is endangered by floods. This impact, however is not considered to be significant.

9.3.4.9 Pressure on Protected Areas Including Natura 2000 Sites

Tasks 18, 23 and 28 will have a positive impact on Natura 2000 sites.

For 18, the pressure on site PLB220005 Pucka Bay will be reduced. However, this reduction, although important, will be somehow offset by the larger volume of treated effluent discharged into the sea from WWTP "Wschod" within Natura site PLB220004 Wistula Esutary.

For task 23 (Sobieszewska Island), located in the vicinity of Natura site PLB220004 Wistula Estuary, the elimination of cesspools in this region will likely have a positive impact, which has been assessed as low.

Finally, it has been considered that task 28 will have a medium positive impact because of the better removal of pollutants.

9.3.4.10 Transboundary Impacts

A low positive impact has been identified for task 28 WWTP "Wschod", because of the better removal of pollutants discharged to the Baltic Sea.

9.4 SUMMARY OF ENVIRONMENTAL IMPACTS

As a summary of the environmental assessment of the impacts, a table with the cumulative impacts both negative and positive of all the tasks is shown below.

No		TASKS	CUMULATIVE ENVIRONMENTAL IMPACTS																			
			Construction phase							Operational phase												
			Geomorphological changes	Water course disturbance	Affection to groundwater quality	Vegetation clearence	Fauna disturbance	Disturbance of protected areas	Disturbance of cultural heritage	Affection to protected landscape	Odour nuisances	Surface water quality	State of seawaters and seaside resorts	Groundwater quality	Drinking water quality	Rationalization of water supply system	Spatial development of the city	Revitalization of degraded downtown and suburban areas	Minimization of flood problems	Pressure on protected areas including Natura 2000 sites	Transboundary impacts
1.	WATER SUPPLY	Building of a measuring and monitoring for the Gdańsk Water System	0	0	0	0	0	0	0	0	0	0	0	+1	+2	+3	0	0	0	0	0
2.		Building of Kiełpino water reservoir along with rebuilding of Migowo pumping station and building of water mains to connect Kiełpino water reservoir with the central Gdańsk water supply system.	0	0	0	-1	-1	0	-1	0	0	0	0	0	+1	+1	+1	0	+2	0	0
3.		Building of water treatment station Osowa complete with water reservoir Osowa	0	0	0	-1	-1	0	-1	-1	0	0	0	0	+2	+1	+1	0	+2	0	0
4.		Building of water main connecting Gdańsk-Osowa with the central Gdańsk water supply system	0	-1	0	-2	-2	0	-1	0	0	0	0	0	0	+3	+2	0	+2	0	0
5.		Rebuilding of Lipce water intake and water treatment plant	0	0	0	-1	-1	0	0	-1	0	0	0	0	+1	+2	+1	+1	+1	0	0
6.		Building of water main supplying Orunia-Olszynka area from Lipce water intake	0	-1	-2	-1	-1	0	-2	0	0	0	0	0	0	+3	+2	+1	+2	0	0
7.		Treatment of water from Pręgowo water intake (building a water treatment station in Pręgowo)	0	0	0	-1	-1	0	0	0	0	0	0	0	+2	+1	+1	0	+1	0	0
8.		Building of water main for Gdańsk-Południe district	0	-1	0	-1	-1	0	0	0	0	0	0	0	0	+3	+3	+2	+3	0	0
9.		Extension of water treatment station Zaspa Wodna	0	0	-2	-1	-1	0	0	0	0	0	0	0	+2	+1	+1	0	+2	0	0
10.		Rebuilding of water intake and water treatment station Dolina Radości	-1	0	0	-2	-3	-2	-2	-1	0	0	0	0	+1	+1	+1	+1	+1	0	0
11.		Water supply to Kokoszki-Bysewo area (building of water supply network in the area of Kokoszki –Bysewo)	0	0	0	-1	-2	0	0	-1	0	0	0	0	0	+1	+2	+2	+2	0	0
12.		Building of water pipeline in Żuławy – area of Olszynka	0	-1	-2	-1	-1	0	-1	0	0	0	0	0	0	+3	+3	+3	+2	0	0
13.		Recommisioning of Stara Dolina water reservoir	-1	0	0	-2	-3	-2	0	0	0	0	0	0	0	+2	+1	+1	0	0	0
14.		Building of water intake and water treatment plant Zakoniczyn	0	0	0	-1	-1	0	-1	0	0	0	0	0	+1	+2	+1	+1	+1	0	0
15.		Reconstruction of water pumping station Ptasia	0	0	0	-1	-1	0	0	0	0	0	0	0	0	+1	+1	+1	+2	0	0
16.		Building of new pumping station in the area of Orunia reservoirs, plus building of two water reservoirs	-1	0	0	-1	-1	-1	0	-1	0	0	0	0	0	+1	+1	+2	+2	0	0
17.		Building a water supply network and new pumping station for lowland area – pumping station Sobieski	0	0	0	-1	-1	0	0	0	0	0	0	0	0	+1	+1	+2	+2	0	0
18.	WASTEWATER	Extension of Wastewater Treatment Plant Gdańsk-Wschód-step III-connection of Wastewater Treatment Plant Zaspa discharge area	0	-1	0	-2	-1	0	-2	0	+3	+3	+3	+2	0	0	0	0	-2	+3	0
19.		Sewage system for Osowa-Barniewice-Klukowo	0	0	0	-2	-2	0	0	0	+1	+2	+1	+2	0	0	+3	0	0	0	0
20.		Sewage and storm water system for Zabornia district	0	0	0	-1	-1	0	0	0	+1	+1	0	+1	0	0	+2	0	0	0	0
21.		Sewage system for Jasień-Wieś	0	0	0	-1	-1	0	-2	0	+1	+1	0	+1	0	0	+2	0	0	0	0
22.		Sewage system for Łostowice district	0	0	0	-1	-1	0	-1	0	+1	+1	0	+1	0	0	+2	0	0	0	0
23.		Sewage system for Sobieszewska Island	0	-1	-2	-1	-2	-1	-1	0	+1	+2	+2	+1	0	0	+2	0	+1	+1	0
24.		Building a sewage system for Gdańsk – Orunia	0	0	-2	-1	-1	0	-1	0	+1	+2	+1	+3	0	0	+2	+3	+1	0	0
25.		Building a sewage system for Olszynka district	0	0	0	-1	-1	0	-1	0	+1	+2	+1	+3	0	0	+2	+3	+2	0	0
26.		Building a sewage system for Kiełpino Górne district	0	-1	-2	-2	-1	0	0	0	+1	+1	+1	+1	0	0	+2	0	0	0	0
27.		Sewage systems for Święty Wojciech and Lipce districts and areas adjacent to Trakt Św. Wojciecha Street	-1	-1	-2	-1	-1	0	-2	0	+1	+2	+1	+1	0	0	+3	+2	0	0	0
28.		Extension of Wastewater Treatment Plant Gdańsk Wschód – step II b – sludge management, adjustment to stricter nitrogen removal requirements	0	-1	0	-2	-1	0	0	0	-1	+2	+2	+2	0	0	0	0	+1	+2	+1
		CUMULATIVE NEGATIVE IMPACTS	-1	-1	-2	-1	-2	-2	-2	-2											

10. PREVENTION AND MITIGATION MEASURES

This chapter describes the prevention and mitigation measures that should adopted in order to prevent or minimize the impacts identified for the project activities. These measures are reflected in the attached set of maps on prevention and mitigation measures.

These measures are mainly aimed at avoiding the more sensitive areas or elements, and optimising environmental conditions during both construction and operation phases.

10.1 CONSTRUCTION PHASE

Construction activities for the WWTP, WTP, pumping stations, sewers, mains, etc. will involve the use of construction machinery and vehicles and large movements of earth and other materials. Construction activities may produce short-term affections due to noise, vibrations, combustion gas emissions, wastewater effluents, runoff, wastes, traffic, land occupation, etc.

The following sections first describe a set of general preventive measures to be implemented during construction works in order to avoid or minimize these effects. This will be followed by a description of the prevention and mitigation measures identified for those impacts that have been considered as significant.

10.1.1 Restrictions to the Location of Construction Camps and Landfills

Construction camps, access roads, material storage areas, and other auxiliary installations that may be needed for facilitating the construction works imply a temporary occupation of land.

The location of these industrial-type facilities determines the seriousness of potential affections, and, therefore, it is necessary to establish conditions with regards to where they can be located or not. Also, the requirement for a centralised unique location for all these auxiliary installations is usually established. However, for this project, which consists of several subprojects spread over a large area and implemented at different moments, this requirement may not be operative. Nonetheless, it should be implemented if subprojects are close and implemented at the same time.

Because of this, an environmental diagnosis of the potential areas to be occupied by these installations has been carried out in order to define:

Exclusion areas, where these installations will be excluded, this is, forbidden. These are areas of very high environmental values and sensitivity, usually with some kind of protection.

Restricted areas, where these installations will only be allowed if no other alternatives locations are available from technical and logistical perspectives. These are areas with high environmental values, but less sensitive than the exclusion areas; which should be preserved of any potential damages.

Unrestricted areas, where these installations will be allowed as long as all environmental safety measures are implemented. These are areas of medium to low environmental sensitivity.

These areas are shown in Figure 7 on Preventive and Mitigation Measures.

Exclusion areas that have been established for this project include: Sites belonging to Nature 2000 network, Trojmiejki Park, the quaternary aquifer 112, woodland areas, natural-landscape areas, and nature reserves.

Before the beginning of construction works, a buffer zone will be established around the construction site to clearly delimitate the working areas. This buffer zone will be physically created by placing temporal stacks or fences along the boundaries, inside which all the activities and works will be performed.

10.1.2 Landmarking Definition

Landmarking will consist on a signposting made of 30 mm to 1 m length angular metallic supports placed every 8 m, and a tape running through the supports to which it will be secured. Also, a fence can be placed if the dimensions of the working area allow. The aim is separating the activity area from the rest of the terrain with a physical barrier which shall not be trespassed by the machinery nor the construction workers.

10.1.3 Selection Process for Location of Construction Camps

During construction phase, the construction camps to locate the concrete batch plant, asphalt mixing area, supply materials, machine and vehicle maintenance areas, etc., must be properly designed in order to control the eflfuents of storm runoff water and wastewater generated in the installations effluents. All the activities related to the construction camp will be centralized in one area to avoid soil and water contamination. The camp will be located outside the exclusion areas and, in choosing the location, it will be taken into consideration that neither water courses nor protected areas are nearby.

In the machine and vehicle maintenance areas, appropriate fuel and chemical management shall be implemented to prevent soil contamination from leaks and spillages. In any case, the requirements set in the building permits with regard to this issue shall be applied.

In all the protection area of aquifer GZWP No 112 – Żuławy Gdańskie, where the quaternary water level is located at a depth of some 5 – 40m and poorly insulated from surface impacts, it is recommended that if the construction camp needs to be placed in this area, the machine and vehicle maintenance areas be covered by an impermeable layer and surrounded by a double ditch system. This system may consist of an external ditch, for diverting water from the areas surrounding the camp, and an internal one for collecting storm runoff from the camp area. The water collected by the internal ditch will be held in detention ponds before its discharge.

The construction camp will be provided with a waste storage area and sanitation facilities. A portable wastewater treatment equipment will be used for faecal waters, analysed and cleaned water will be discharged into the closest watercourse, once the parameters comply with the legislation and the required permits have been issued. Alternatively, self contained portable toilets equipped with a tank with desinfectant liquid may be used; in this case proper management of the used toilets and their waste should be assured.

Waste oil and grease generated at grease separators will be considered and treated as hazardous waste.

10.1.4 Landfill and Earth Borrowing Sites

If earth borrowing sites are used to obtain earth and other rock materials for construction, soil leftovers from excavation activities will be used, if possible, to refill the earth borrowing sites. Otherwise, since this project involves a considerable generation of earth left overs, these will be sent to authorized landfills. In no case, exclusion areas will be used as earth borrowing or landfill sites.

10.1.5 Waste Management

During construction, an adequate waste management system shall be in place to guarantee a proper waste management, either liquids or solids generated as a result of the construction works and in particular the operation and maintenance of heavy construction machinery, including excavators, bulldozers, concrete mixers, etc.

Wastes generated during construction include hazardous wastes (mainly oil and greases from machinery), inert wastes (mainly construction debris), solid waste (packaging, cardboard, wood pallets, paper, plastic, food and beverage containers and food leftovers from canteen, etc.), and sanitary wastes (toilets).

Wastes shall be managed as follows:

- Compliance with European as well as Polish regulations on this matter;
- Waste must be segregated and disposed of, reused, or treated properly;
- As long as possible waste recycling will be performed;
- Maximise the use of materials containing less packaging so as to minimise waste production;
- Waste storage storage areas shall be signposted properly and constructed with the necessary safety measures to ensure the protection of the environment;
- A machinery maintenace and clean up plan will be in place;
- Any machinery generating more hazardous waste than expected will be replaced;

- Storage materials would have a maintenance and follow up control;
- An internal emergency plan, including spill prevention planning will be developed;
- The duty of care documentation for any hazardous waste and materials will be a must.

10.1.6 Air Quality Protection Measures

Construction activities may produce air quality impairment due to the emission of solid particles and gases.

Measures to be adopted to minimise air emissions during construction phase will include:

- Water spraying of all the areas that have been devoid of vegetation, earth materials standing along the work site, temporary access roads, construction camp, etc. Water spraying will be done as necessary, depending on weather and soil conditions.
- All materials that are susceptible of producing dust will be covered during transportation. Thus, hauling trucks will be provided with tarpaulins.
- Also, to prevent dust generation during transportation of dusty materials, speed limitations will be established. It is recommended to reduce the speed of construction vehicles and trucks will be reduced to 10 km/h in residential areas, areas with high value vegetation and fauna, and cultivated areas with crops that have not been collected yet.
- It is recommended to select transportation routes and times that minimise the impact on dust-sensitive receivers.
- Mixing equipment should be well sealed.
- Minimising on-site storage time of construction materials.
- All the vehicles will be operated in compliance with relevant vehicles emission standards and with proper maintenance to minimise air pollution due to combustion gases.
- All compressors and power generators will comply with air emission standards.
- Filling and covering of the excavated areas as soon as construction is over.
- Fires made at the construction site will only burn wood. In no case the burning of tires, plastic, fuel, etc. will be permitted.

10.1.7 Noise Prevention Measures

Noise and vibration will be generated during this phase by heavy construction machinery including excavators, concrete mixers, and transportation vehicles. Generally, construction noise exceeding a noise level of 70 decibels has significant impacts on surrounding sensitive receivers within 50 metres of the construction site.

Major abatement measures will include:

- No nighttime construction using heavy machinery will be allowed. In construction sites within 150 m of residential areas of with sensitve habitats, noisy construction activities should be stopped from 22:00 to 06:00.
- Noise regulations will be strictly enforced to protect nearby houses, hospitals, schools from annoyance generated by noise and vibration.
- All the vehicles and machinery will be operated in compliance with relevant vehicles noise emission standards and with proper maintenance to minimise noise and vibrations. If necessary they will be equipped with silencers.
- All compressors and power generators will be of the silent type.
- For larger developments, where traffic may an issue, the development of a traffic plan may be considered so that transport routes for large trucks avoid residential areas.
- It is recommended to limit speed to 10 km/h in residential areas.

10.1.8 Soil Mitigation Measures

Cut-and-cover construction techniques would be used where possible to minimize environmental impacts resulting from disruptive surface construction.

Topsoil from the construction areas where excavation or levelling activities will take place, will be dug in a selective way and will be separately stored for a later use in revegetation activities. Topsoil will be piled in heaps at sustainable places in the nearest location from where it was been removed.

The procedure will be as follows:

Excavation

- A selective excavation will be carried out to separate the top layer of soil, known as Horizon A, which is the one with the higher concentration on organic matter and therefore, the most fertile.
- The selected soil should not neither contain clay nor being too sandy, and its ph must range between 5,5 and 8.
- The presence of stones branches, and other large objects shall be avoided.

Earth pilling

- The excavation materials should be piled up in heaps of a trapezoidal shape, with a base of 6 m and a maximum height of 1,50 m.

Preservation

- In order to avoid the loss of nutrients associated to lixivation processes, sowing, fertilising and watering measures will be applied as necessary.
- Heavy machinery will not be allowed to pass over the piled soil.

Reuse

- Topsoil will be used in all those construction areas which will remain unpaved after construction. The land in these areas will need to be reclaimed by implementing revegetation measures in which the top soil will be used for facilitating plant growth.
- For this, a layer of top soil with a minimum thickness of 30 centimeters will be placed in the areas to be revegetated.
- If the topsoil does not reach the 2 % in organic matter, it will be treated by adding humus or mould.

10.1.9 Surface Water and Groundwater Protection Measures

The following measures will be implemented to prevent the entrance of pollutants into the hydrology and hydrogeology systems:

Sediment containment barriers

Containment barriers, made for example of straw bales will be located close to any water course, which could be affected by runoff from the construction works. Their purpose is to prevent the massive arrival of sediments and other particles with runoff water.

The location and installation must be carried out before the beginning of the construction phase.

They will be installed in areas without vegetation, intercepting the rain water runoff.

The correct placement of these containment barriers shall be so that runoff water is allowed to flow through them at the same time a retention of sediments of up to 67% is achieved.

Gravity separators

Because in most of the sites where trench excavation will take place, groundwater is expected at relatively shallow levels, there will be a need to pump out this water, which will be discharged into nearby water courses. In order to avoid the contamination with solid particles from the excavation process, gravity separators for the sedimentation of solid particles will be used before effluent discharge.

Oil and grease separators

If the construction camp needs to be placed in the protection area of aquifer GZWP No 112 – Żuławy Gdańskie, it is recommended to install oil and grease separators to treat the runoff water containing hydrocarbon pollutants from the machinery and vehicle maintenance area.

Sanitary wastewater treatment equipment

Small amounts of sanitary wastewater will be generated by the construction workers. If self contained sanitary facilities are not used, and faecal wastewater need to be discharged, to minimise this impact,

interim pipelines will be placed to convey the wastewater to nearby sewers. If no sewers exist in the vicinity of the work site, interim holding tanks where wastewater shall be subject to a treatment process will be constructed, with the effluent discharged to the existing drainage after checking that effluent discharge quality standards are met.

Spill prevention plan

The security and health plan shall identify the risks for the occurrence of hazardous spills, preventive measures and action measures in case of spills.

10.1.10 Flora Protection Measures

The following measures will be implemented to protect vegetation:

Construction of interim access roads will be reduced as much as possible by using already existing roads.

Before construction works start, on the stage of building permit, an inventory of the trees along the path of the pipeline or in the areas to be occupied by buildings, reservoirs or other infrastructures will be carried out. If valuable trees would need to be cut, the possibility of transplanting them to other locations will be analysed or the pipeline path modified. Otherwise compensation measures will be studied. Special consideration will be given to any plant that is found of the species *Hippophae rhamnoides*, which is under strict protection.

In all cases, revegetation measures will be implemented as construction works are finished. The aim is to replace the vegetation that was removed and return the construction sites to their original conditions. This is, the same species that were removed and exist in the area will be used for revegetation.

To preserve forest areas or protected ecological sites, earth borrowing, landfilling, pilling, and building of construction camps will be prohibited in these areas.

The vegetation of the areas surrounding the work site will be protected by landmarking or fencing the perimeter of the work site and forbidding machinery and workers the trespassing of such limits.

No open trimmings or cutting burning will be allowed during the dry season. All necessary preventive measures to avoid fires will be implemented.

The trunks of the trees near the construction sites will be protected by means of wooden planks, 2,5 m high, tied with wires around the trunk. These protection will be removed when construction activities near the tree are over.

10.1.11 Fauna Protection Measures

This section shows the relevant preventive and corrective measures that have to be implemented to minimise fauna impacts.

Before the start of the construction works, in protected areas, the protected fauna species existing in the area will be identified. Information on such species will be provided to construction workers, together with instructions for not disturbing them. This will be particularly important when the construction works will occur in forested areas and other areas where natural values are still present despite urban development.

The noisiest and dustiest activities will be scheduled so as to avoid the breeding periods of, at least, the most significant species that might live in the area (protected, vulnerable or rare species). During these periods, only those construction works that are strictly necessary will be carried out, noise levels above 75 dB shall not be exceeded, and the use of high intensity light sources will be avoided.

For construction works where water courses have to be crossed, the physical disturbance of the banks and river bed shall be brought to a minimum by installing a temporary elevated cross above the water course, which will be removed as soon as the construction works are finished. If disturbance of the banks or river bed occurs, these will immediately be restored.

Construction activities that may disturb the banks or the bed of a water course where significant fish or othe water related species may live, will also be scheduled so as to avoid the breeding periods of these species.

10.1.12 Protection of Protected Natural Areas

Article 6 of Directive 92/43 states that in order to ensure the restoration or maintenance of natural habitats and species of community interest, designated special areas will be preserved establishing all the required measures to protect wild fauna and flora. If necessary, compensatory measures will be developed which are not part of the EIA procedure.

Natural protected areas will be preserving by applying the following measures:

- Earth borrowing sites, landfills, earth pilling, and camps will be prohibited;
- Natural protected areas will be fenced;
- Interim roads will not be allowed to be constructed within these areas;
- Should a habitat affected by the project, restoration measures will immediately implemented;
- If necessary, compensatory measures will be developed.

10.1.13 Cultural Values Protection Measures

Some of the tasks of the water and wastewater project will take places with valuable cultural assets subjet to legal protection, such as historical buildings, sacred buildings, engineering infrastructures, parks, cemeteries, and archaeological sites. Protection measures to be taken during the construction phase include:

Those cultural assets that might be affected will be marked off by means of stakes and tape. Construction workers will be informed on the importance of the cultural asset and will receive instructions on not carrying out activities that may cause damages to the asset.

According to the decisions obtained for subtasks within archaeological sites, an archaeologist shall be present at the construction site monitoring all the excavation works to check that archaeological remains that may potentially appear are not destroyed and are adequately identified and protected.

All fossils, value or antiquity coins, articles and structures and other remains or items of geological or archeological interest found on the work site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's personnel or other persons from removing or damaging any of these findings. The Contractor shall, upon discovery of any such findings, promptly give notice to the Contract Engineer, who shall issue instructions for dealing with the finding.

10.1.14 Reclamation of Land Occupied by Construction Camps, Interim Access Roads, and other Construction Installations

Once the construction works will be finished, the land occupied by interim installations associated to the construction works will be cleared. All the machinery, vehicles, shelters, construction materials, etc. will be removed.

The compacted soils will be ploughed down to a depth of 40 cm so as to loosen them and prepare them for revegetation. A fertilizer (N-P-K) will be applied in equivalent amounts of 200 gr/m^2.

10.1.15 Revegetation Measures

Revegetation of the areas that have been devoid of vegetation and should be returned to their original conditions will be revegetated taking into account the original features of the vegetation that was removed.

A revegetation project will be prepared with the main objective being the reclamation of altered land, prevention of erosion problems, and integration with the surrounding landscape.

For this, any new land morphology that might have been created as a consequence of the construction works (i.e. talus or banks) will be first shaped so as to integrate them in the surrounding morphologies.

The plant species to be used shall be native. The use of the species already existing in the area to be revegetated will be preferred. In this regard, the use of *Symphoricarpos albus* (śniególiczka biała) will be expressly prohibited. This is an invasive species coming from North America, which displaces native species.

For pasture (meadows) areas, the seed mixture already existing in the top soil that is to be selectively removed and stored should be enough for revegetation.

Plant inventories and revegetation projects are currently being prepared for all the tasks of the Gdańsk Water and Wastewater Project. Planned plantings for some of the tasks (the works are to be completed) are as follows:

Task 19. Sewage system Osowa - Barniewice - Klukowo
Pipeline path *Rosa rugosa* (225 individuals) *Thuja occidentalis* (8 individuals) **Ground around sewage pumping-station** *Acer camestre* (38 individuals) *Betula verrucosa* (20 individuals) *Pinus silvestris* (25 individuals) *Cornus alba* "Sibirica" (740 individuals) *Cornus stolonifera* "Flaviramea" (605 individuals) *Kerria japonica* (545 individuals) *Caragana arborescens* (505 individuals) *Lonicera tatarica* "Arnold Red" (750 individuals) Polish flowery meadow (1020 m^2; 1,5 g/m^2 of seeds): *Leucanthemum vulgare, Ranunculus acris, Achillea millefolium, Leontodon hispidus, Papaver rhoeas, Kautia arvensis, Centaurea jacea, Lichnis flos-cuculi, Galium verum, Runculus repens, Carum carvi, Rumex acetosa, Rhinanthus minor, Sanguisorba officinalis, Trifolium prantense, Centaurea phrygia, Trifolium repens, Vicia grandiflora, Daucus carota, Tragopogon pratensis, Luzula campestris, Prunella vulgaris, Lotus corniculatus, Anthemis arvensis.*
Task 21. Sewage system for Jasień Wieś
Pipeline path *Spiraea arguta* (100 mb) *Acer pseudoplatanus* (41 individuals)
Task 26. Building of sewage system for district Kiełpino Górne (stage IV)
Pipeline path *Salix caprea* "Pendula" (6 individuals) *Prunus padus* (6 individuals)
Task 6. Building of water main for Orunia - Olszynka region supplied by Lipce water intake
There is no affection to vegetation (trees and shrubs)
Task 12. Building of water main on the Żuławy area - Olszynka
There is no affection to vegetation (trees and shrubs)
Task 25. Building of sewage system for Gdansk Olszynka
There is no affection to vegetation (trees and shrubs)

10.1.16 Landscape Protection Measures

There areas where new infrastructures will be built above the ground surface and where the land topography will contribute to make them highly visible (i.e. Task 10. Rebuilding of water intake and water treatment station Dolina Radośc). In these areas, the following mitigation measures will be implemented:

- Use green or brownish colours to paint the reservoirs and pipelines emerging from the ground;
- The architectural style of the auxiliary buildings should be similar or match that of the buildings in the area;
- Landscape the area around these installations so as to create a vegetal screen that partially hides the most visible structures, thus dissimulating their presence. Care should be taken for this screen to be as natural as possible, this is a continuum with the surrounding vegetation.
- If artificial banks have been created (i.e. at landfill sites or hilly areas), the edges of the banks should be soften to give them a more natural form. Also, if needed, the banks will be provided by rainoff ditches along the upper edges to avoid erosion processes.

The surface of the banks will be revegetated with the species existing in the surroundings. The revegetation design will be such that the natural conditions of the surrounding area are reproduced.

10.2 OPERATIONAL PHASE

10.2.1 Measures Against Odour Nuisances

Odour nuisances may occur as a result of the operation of the wastewater treatment plant. Wastewater collection and treatment emissions contain substances that emit odours offensive to plant personnel and the public. Hydrogen sulphide generated during sludge processing can cause community complaints and render working conditions unpleasant.

The sources of odours cannot be completely eliminated, however, they can be minimised through good house keeping, proper facilities design and operations, and control of discharges.

The approach to be used for the control of odours from the wastewater treatment plant is a community approach. A progressive Odour Management Plan will be formulated for the plant, which will allow the operator to respond to odour complaints and revise operations as necessary. The plan shall include a complaint response protocol and develop progressive measures to be implemented in the event of repeated, verified complaints. The plan shall describe the location of the odour-sensitive receptors within 2 km of the site, and meteorological conditions effecting migration of odours from the site and preventive measures being implemented to minimize odours.

When strong odours at off site receptors will be verified, changes in site operations will be made to reduce the potential for odours.

The three general approaches to control odours will be analysed: elimination of the odour source, elimination of the odour perception, and treatment of the odour. Options for reducing odours may include installing odour control equipment, dilution with fresh air, masking the odour, removal and disposal of odoriferous compounds, making process/treatment modifications, off gases treatment with carbon adsorption or wet scrubbers, installation of covers on tanks and chambers that process wastewater, etc.

The following specific measures to minimize odours have been identified by the developer that are to be implemented with the project, namely:

- Sludge drying facilities will be equipped with closed air circulation system and air emission treatment (biological filter or burning in bio-gas boiler)
- Dry sludge stored in silos and transported in cistern trucks. The area of interim storage will be enclosed in 4 m height concrete walls and roofed.

10.2.2 Measures Against Noise and Vibration Nuisances

Noise generated by the motors and other equipment running at WWTP and the pump stations in the vicinity of residential or leisure areas will be minimized with mitigation measures that involve the following:

- Selection of equipment with low noise and vibration emission levels;
- Self contained installation of the pumping equipments, ensuring that walls and roofs provide adequate acoustic insulation;
- Underground installation of the pumping equipments;
- Establishing a green belt buffer around the stations

11. ENVIRONMENTAL MONITORING

The purpose of the Environmental Monitoring is to guide the set up of an Environmental Monitoring Plan to ensure the compliance with the Environmental Impact Assessment (EIA) study recommendations, to assess the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action.

The objectives of the plan should be as follows:

- Verify that mitigation measures or remedial actions proposed for each of the phases of the project are correctly implemented.
- Monitor the evolution of residual impacts or the existence of induced impacts or impacts that were not forecasted, so as to proceed, as soon as possible, to their minimization, elimination or compensation.
- Provide information regarding the appropriateness of the mitigation measures and remedial actions implemented.

11.1 RESPONSIBILITIES

The monitoring plan shall be implemented by the sponsor, this is the Gdansk Water and Wastewater Infrastructure Company, with the help of a contracted Technical Assistance. Because the subtasks will be conducted at different times and are of different sizes, technical assistance will be contracted from three engineering companies who will be required to develop for each task a detailed monitoring programme which will address the environmental mitigation measures set in the building permit for the task and in this EIA. The results of the implementation of the monitoring programme shall be reflected in monthly reports, which will be reviewed and approved by GIWK officials. These requirements will be included in the Terms of Reference of their contracts.

The Terms of Reference for the Contractors and Contract Engineers will be prepared in accordance with the contract conditions for building and engineering works established by the International Federation of Consulting Engineers (FIDIC). In this regard, the FIDIC conditions require that the Contractor take all reasonable steps to protect the environment (both on and off site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations. The contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values indicated in the specification, and shall not exceed the values prescribed by applicable laws.

In addition, the main goal of the contract for the Contract Engineers will be to ensure effective supervision/control during implementation of contracts for building and engineering works, with

assurance of implementation of all tasks included in the contract and with assurance of obtaining useful, financial effects, with maximum environmental protection during building and operating phases.

The employer (GIWK) shall expect that Contract Engineer will reach these goals through:

- Ensuring that the implementation of contracted building and engineering works comply with Polish building law and administrative permits, and
- Enforcement of requirements connected with material and construction works quality provided/delivered by Contractor.

11.2 STRUCTURE OF THE MONITORING PLAN

The Environmental Monitoring Plan will be organised in two phases: construction of the infrastructures and operation of the facilities.

In order for the monitoring plan to guarantee the environmental sustainability of the projects it is suggested that two levels of checking or monitoring systems are included in the design of the monitoring programme, namely:

- Establishing and checking the correct implementation of the technical conditions to be applied in the execution of the mitigation measures and the different elements of the project, in accordance with the recommendations and requirements addressed in the EIA and the building permits.
- Designing a series of monitoring activities which allow to carry out an experimental assessment of the evolution of impacts and the performance of the mitigation measures adopted. For this, the parameters to be monitored should be established together with the thresholds that are considered admissible, and the actions to be taken in case these thresholds are exceeded.

It is proposed to establish a system of environmental indicators which will be compared with the original situation so as to know the situation and evolution of each environmental factor potentially affected at any time during the construction works or the operation of the facilities.

11.3 MONITORING ACTIVITIES

The application of all or only some of the monitoring activities indicated below will depend on the size, features and location of the subtask for which the monitoring programme is to be designed.

11.3.1 Construction Phase

During the construction phase the main tasks of the Contract Engineer will be:

Monitoring of environmental impacts identified in the EIA reports in relation to the methods of construction works,

Ensuring archeological supervision/control during construction works, if necessary,

Control of waste storage and material storage areas and control of the dismantling of the occupied areas and its restoration to primary conditions,

Ensure that construction works are conducted in such a way that annoyance to residents is minimal,

Ensure construction works are conducted with proper healthy and safety levels,

Acceptance of equipment, transport and measuring devices, and materials used during construction works in accordance with contract conditions.

According to the proposed structure, during this phase the Environmental Monitoring Programme shall focus on:

- Establishing a system that ensures the correct execution of all the preventive, corrective and/or compensation measures established in the EIA and the building permit; and
- Checking that the effects generated by the construction works as well as their magnitudes are those forecasted in the EIA, through the monitoring of the affected environmental variables.

Monitoring of the correct execution of mitigation measures

Control of the adequate location of the construction camp

Control of the adequate construction of the machinery maintenance area

Control of adequate installations for waste storage

Control of adequate locations for material storage areas

Control of adequate locations for storage of removed top soil

Control of the selection of landfills and earth borrowing sites

Control of interim access roads

Control of construction machinery movements and truck traffic

Control of the implementation of controls to minimize noise and air pollutants

Control of the execution of staking out to physically separate sensitive areas

Control of dismantling and cleaning of construction camps and work areas

Control of the execution of revegetation measures

Monitoring of environmental effects

Air quality and noise levels

Control of machine and vehicles parameters regarding noise levels and air pollution

Water quality

Monitoring of used waters (for example for horizontal grilling) before their discharge into surface water bodies

Geology

Monitoring of sliding risks, for tasks located on areas with high slopes

Flora and Vegetation

Monitoring of protected species and significant vegetal communities

Monitoring of revegetation activities: control of top soil removal and piling, control of top soil conservation, control of top soil application, control of seeding and plantations.

Fauna

For tasks 10, 13 and 23, monitoring of affections to protected species or significant communities

Social environment

Monitoring of affections to residents due to traffic modifications

Monitoring of affections to residents due to interference with agricultural activities

Cultural resources

Monitoring of the protection of historical and artistic heritage.

Monitoring of the protection of the archaeological heritage.

11.3.2 Operational Phase

During this phase, the Environmental Monitoring Plan shall focus on:

- Verifying the execution of the maintenance and conservation tasks needed for the implemented measures (e.g. among those referred to the creation of a vegetal cover: watering, replacement of non viable individuals, etc.);
- Checking the effectiveness of the mitigation measures that were applied during construction works (i.e. revegetation measures);
- Determining the effect of the installed infrastructures on the environment so as to assess the effectiveness of both the project actions specifically designed to enhance environmental conditions, mainly water quality, and the mitigation measures proposed in the EIA for the residual negative impacts identified for the operational phase.

Monitoring of the correct execution of mitigation measures

Control of the adequate maintenance activities for the revegetation works

Monitoring of environmental effects

Hidrogeology and water quality

To enable full control over the rationality of water supply management as well as the fulfillment of the EU standards, a system of metering and monitoring water quality will be established for the Gdańsk Water System.

A groundwater quality monitoring system has been implemented since 1997 at the Gdańsk–Wschód WWTP, which has shown that the storage of sewage sludge has no a significant impact on groundwater pollution. The solutions planned within the area of sludge management will further limit the potential hazards for groundwater. This monitoring system will continue to operate in the future.

Air quality and noise levels

Potential air contaminants and noise levels shall be monitored at the limits of the Gdańsk-Wschód WWTP property as well as in the vicinity of the WWTP. Parameters to be monitored will include sulphur dioxide, nitrogen dioxide, carbon oxide, suspended particulate matter as well as odours and noise levels.

Monitoring should be carried out after the WWTP planned modernization. Should the concentrations in the vicinity of the WWTP exceed regulatory thresholds, it will be necessary to establish an area of limited use, according to the provisions of the Environmental Protection Act.

Flora and Vegetation

Monitoring of the evolution of vegetal communities associated to water bodies

Landscape

Monitoring of the evolution of revegetated areas

11.4 REPORTING

All the monitoring activities should be documented in technical reports, which will be prepared periodically according to the performance of the controls. This will allow to adjust the scope of the monitoring plan by modifying objectives as well as impact indicators and monitoring frequencies if this is deemed necessary from the results of the monitoring activities.

In order to help to prepare the reports indicated below, a suggested format of work sheets to be completed during the performance of the monitoring activities is as follows:

ENVIRONMENTAL MONITORING PLAN **WORK SHEET No X. Monitoring of .....**
Activity
Objective
Indicator
Control parameter
Baseline measurement
Thresholds
Monitoring points
Complementary action measures
Documents to be provided
Observations

The reports to be prepared may include:

Baseline monitoring report: this report will contain all the studies, sampling and analyses that are needed before the start of the works.

Monthly reports: during construction works reports will be prepared on a monthly basis. This report will describe the monitoring activities carried out during the preceding month and the results obtained. During the operational phase the frequency of these reports will likely be lower.

Final report: this report will sumarise the works implemented and the results of the monitoring activities.

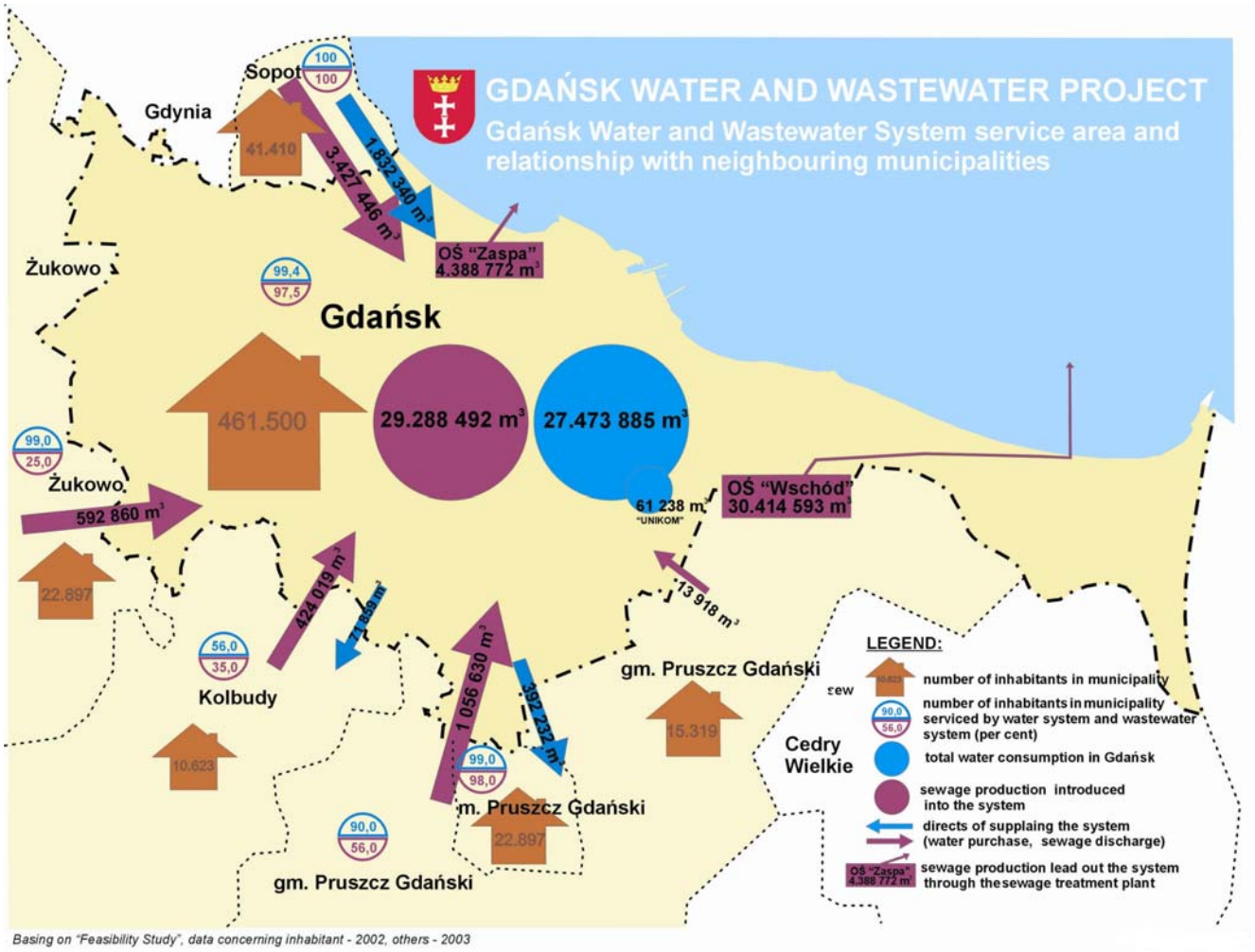
Extraordinary reports: Should an unexpected significant affection to the environment occur, a report will be prepared to describe the affections, the cause of the affection and the measures that were taken to mitigate the impact.

12. CONCLUSIONS AND RECOMMEDATIONS

The accession of Poland to the European Union and the process of adjusting Polish regulations to the EU legal system, the requirements of the Frame Water Directive, in particular, have resulted in growing requirements concerning environment protection. The Gdańsk Water and Wastewater Project addresses these obligations, particularly within the area of keeping high water supply standards, good quality of water, reduction of the concentration of nutrients wastewater effluent as well as sound environmental solutions for the final disposal of sludge.

The implementation of this project will ensure that the requirements set by the Polish and European Union policies are met, and at the same time allows to fulfill Polish obligations resulting from the Convention on the Protection of the Marine Environment of the Baltic Sea Area.

The project itself consists of a total of 28 water and wastewater investments, all of which will be implemented in the city of Gdańsk, except one, which will be located in the neighbouring commune of Kolbudy. The project benefits however, will encompass a much wider area, reaching the Bay of Gdansk and the neighbouring communes. In the attached figure the relationship between the city of Gdańsk and its surrounding communes both is terms of water supply demands and wastewater discharges is shown.



Basing on "Feasibility Study", data concerning inhabitant - 2002, others - 2003

The reason for the preparation of this EIA lays on the request for Cohesion funding made by the City of Gdansk. As required by the Cohesion Fund guidelines, all application for the Fund's assistance must include documentation concerning assessment of the project's environmental impact according to the requirement of Directive 85/337/EEC as amended by Directive 97/11/EC. In addition, the City of Gdansk has requested the European Bank for Reconstruction and Development (EBRD) to participate in the co-financing of this project. Accordingly with its policy, the EBRD requires that projects be structured so as to meet applicable national environmental law, and EU environmental standards, insofar as these can be applied to a specific project.

Although Poland has a long track record in EIA procedures, in the past, the EU has been concerned with the Polish approach to screening of Annex II projects and assessing the impacts on Natura 2000 sites, including those listed on the so called 'shadow list' prepared by NGO's. This situation, however, has recently changed with amendments to the Polish Environmental Protection Law, and one of the aims of this EIA statement has been to check that appropriate screening is undertaken.

Since the EU requires that the impacts of the entire project are assessed and not just its individual elements, as it is done under current Polish EIA procedure, an EIA such as the one presented herein is required that encompasses all of the concerns listed, and be fully in compliance with the EU EIA Directive as amended as well as Polish environmental regulations.

From the assessment of the environmental impacts of the project, it can be concluded that the majority of the negative impacts will occur during the construction phase and all those that have been considered as significant have been assessed as compatible or moderate. Compatible or low impacts of this project mainly include impacts on environmental resources of medium quality, with possibility of an easy recovery, and moderate or medium impacts mainly impacts of a small magnitude on environmental resources of medium quality, when they are irreversible, or on environmental resources of high quality, when they are reversible in the medium or long term without the need of mitigation measures.

These negative impacts during the construction phase include:

- Geomorphological changes due to the creation of artificial talus or banks in areas where buildings and other infrastructures are built in a steep slope of the terrain. These geomorphological changes could eventually cause stability problems in terrain (i.e. sliding risks).
- Disturbance of the water course will take place through physical works where there is a need for crossing the water course.

- Groundwater from the upper Quaternary aquifer in the project area is vulnerable to contamination and does not have an stable quality. Groundwater pollution could take place as a result of excavation and construction camp activities.
- Construction will result in the removal of trees, shrubs and other vegetation along the pipelines routes, the pumping station land lots, and the water and wastewater treatment station sites. Other agents that may deteriorate vegetation in the vicinity of the construction site are dust from excavation and earth movements, accidental hits by heavy machinery or vehicles, and dryness when naked roots are exposed.
- Construction activities are known to affect the fauna either by eliminating individuals and animal shelters, or by interfering with their activity patterns. The fauna present in some of the project areas is rich and varied, the majority associated with forest complexes. Construction activities may cause the destruction of a limited number of localised individuals within a population over a short time period (less than one generation) and a transitory displacement of populations, without this affecting the abundance or distribution of the populations present in the project area.
- Some of the tasks of the project happen to be situated in or near protected areas, including Natura 2000 network sites. Protected areas can be affected if there is temporal or permanent land taken, implying a loss of ecological values. Traffic and access roads could also affect them. The surface affection will be low.
- The cultural heritage comprises a wide and varied set of historical and cultural goods, whose conservation may be directly or indirectly affected by the construction works. Thus, the construction activities that could generate an impact on the cultural heritage are those implying excavation or other types of earth movements, since they could destroy buried archaeological remains.

Other negative impacts considered not significant with the application of routine sound environmental preventive, but that should be taken into account during the construction phase are:

- Combustion gas emissions (CO, NOx, HC) from machinery and vehicles, and dust emissions from earth movements, excavation, and hauling.
- Noise and vibrations from the operation of heavy construction machinery and transport vehicles.
- Soil impacts in areas where either pipe network or the building construction works are located in unpaved areas.

- Impacts on water quality form suspended solids and fuel and grease contaminants in effluents from trenches, treated wastewater and run off from the construction camp and other construction work sites, and accidental spillages or leaks.
- The demolition of the decommissioned objects of the Zaspa sewage plant, which was built in the thirties, may result in the removal of asbestos likely used in construction materials. Removal of asbestos cement pipes as well as roof made of asbestos may negatively impact the environment and particularly the health of workers if adequate safety measures are not applied. The need to take such safety measures is strictly regulated by EU Directives and Polish legislation.
- Construction works in urban areas will likely imply traffic problems mainly due to streets cuts and traffic detours. In rural areas, the construction of pipelines passing through private properties may interfere with agricultural activities. This impact is considered non significant, but the construction works plan will need to take into account these aspects in order to minimise these annoyances,

Once operational, the whole project will have a major positive impact on the environment as it will allow a great improvement in surface/sea water quality. This improvement will be gradual through time according to the project implementation. Nevertheless, some environmental impacts have to be considered, such as:

- Impacts on landscape and visual amenity will potentially occur as a result of the operational phase (presence of buildings, reservoirs, and talus). Several of the project tasks affect areas protected for their high landscape values.
- The operation of a wastewater treatment plant often results in the emission of odours offensive to plant personnel and the neighbouring community. Areas of the WWTP such as the bar racks, screens, settling tanks, aeration tanks, and sludge units are all potential sources of odours. The area immediately surrounding the Gdańsk Wschód wastewater treatment plant consists of industrial facilities, mainly represented by the Gdańsk refinery, some warehouses and office buildings, and agricultural land and pastures to the North, South and East. In assessing this impact it has to be taken into account that the project also involves the dismantling of the Zaspa wastewater treatment plant, currently affecting a densely populated area of the city of Gdańsk, which will be a positive effect, offsetting this negative impact. Also, it should be considered that the project involves an upgrading of existing WWTP facilities, and, therefore, an improvement of the efficiency of the Wschód WWTP performance and reduction of its aerosanitary and acoustic nuisances,

- Noise and vibrations emissions from the performance of the pumping equipment in pumping stations may be a potential impact to neighbouring residents.

The negative impacts of the during the construction phase of the Gdańsk Water and Wastewater Project will be short term impacts that will be largely offset in the operational phase, which will have very few negative effects, and, in any case, amenable to mitigation. The implementation of the Gdańsk Water and Wastewater Project will by far decrease the negative impacts occurring under the current conditions of the water supply and wastewater systems, contributing to the strengthening of the present trend of improvement of environment conditions, including better water quality, better sanitary conditions and living and health standards of many districts of the city, enhancement of the natural environment with unique resources and value, more effective protection of NATURA 2000 sites located in the close vicinity of the city.

The Gdánsk water and wastewater project positive impacts may be listed as follows

Impacts from Sludge Management

The option that has been selected for sludge management in this project is sludge drying combined with production of electricity. This option has the following environmental advantages:

Odour impacts from granulated sludge are less likely than those of handling of dewatered sludge, specially if it has to be stored for prolonged periods on site.

The mass of dried sludge to be transported is small and it will be transported in closed trunks, whereas large scale transport of dewatered sludge may pose and environmental risk.

Burning the granulated sludge at the Heat and Power Company reduces the amount of coal burnt.

Reduced imported electricity requirement at WWTP.

Impacts of Treated Effluent on Receiving waters and Baltic Sea

There will be a significant reduction of the pollution loads (including phosphorus and nitrogen) discharged to the Baltic Sea from Gdańsk area after the closure of Zaspa WWTP and the modernization of Wschód WWTP. This will result in the fulfilment of Polish and EU binding standards. In addition, the reduction of the pollution loads will result in an improvement of the sanitary conditions of the beaches and bathing areas, which will increase the attractiveness of the coastal zone for recreation, enabling its proper use and development, It is estimated, that the above mentioned reduction will be achieved and this will have to be confirmed by putting a monitoring plan in place.

Impacts of Sewage Network

The project will improve the sanitary status of urban areas through the extension of the sewerage network into areas presently not served, and where disposal of wastewater is conducted in cesspools,

septic tanks and even direct discharge in to water bodies. Thus, the extension of the sewerage network will eliminate the ground and groundwater contamination currently existing due to seepage from leaky holding tanks or emergency spillages.

The construction of a new sewer connecting the Ołowianka pumping station and the Wschód WWTP will minimize the risk of the serious breakdowns of the wastewater system both in the area of the city connected with the WWTP by a single collector as well as in the adjacent valuable nature areas of the NATURA 2000 network.

Impacts of Zaspa WWTP Decommissioning

The decommissioning of the obsolete Zaspa WWTP, located in a densely populated area of the city, will eliminate the nuisance and odour problems associated with the plant operation, septage collection and transportation of sewage. In addition, it will provide for the possibility of restoration and development of the area of the closed plant.

The diversion of the wastewater from the Zaspa WWTP catchment area to the developed and modernized Gdańsk-Wsschód WWTP, will cause a significant reduction of pollutant loads discharged into the Bay of Gdańsk. A consequence of that will be further systematic improvement of the environmental quality of the coastal waters as well as the improvement of the quality of bathing waters in the city area.

Impacts of the Reorganization of the Water and Wastewater Management

The reorganization of the water and wastewater management in many districts of the city, together with the dismantling of the Zaspa WWTP, will give the municipality new areas for further development and enable the revitalization of the central and suburban areas of the city.

The rationalization of the use of ground water resources will result in the improvement of drinking water supply, including the improvement of the reliability of a water supply meeting quality requirements.

Also, as a result of the groundwater level control and increased uptake, the planned groundwater abstraction system will result in the stabilization of groundwater levels in some areas of the lower terrace of the city, this minimizing the flooding threat for the building structures.

The risk of sanitary and health threats as a result of water logging and floods in the area of the Gdańsk Lowlands (Żuławy Gdańskie) will be reduced as well, with the implementation of the water and wastewater management tasks in connection with the development of the Wschód WWTP.

In order to minimize the negative impacts, a series of prevention and mitigation measures should be implemented. These measures are mainly aimed at avoiding the more sensitive areas or elements. Recommended mitigation measures are the following:

- Restrictions to the location of construction camps and landfills.
- The activity area will be separated from the rest of the terrain with a physical barrier which shall not be trespassed by the machinery nor the construction workers.
- Selection process for location of construction camps. Construction camps must be properly designed. The camp will be located outside the exclusion areas and. In choosing the location, it will be taken into consideration that neither water courses nor protected areas are nearby.
- Since this project involves a considerable generation of earth leftovers, these will be sent to authorized landfills.
- During construction, an adequate waste management system shall be in place to guarantee a proper waste management.
- Measures will be adopted to minimise air emissions during construction phase.
- Abatement measures will be adopted to minimize noise impacts.
- Cut-and-cover construction techniques should be used where possible to minimize environmental impacts resulting from disruptive surface construction. Topsoil from the construction areas where excavation or levelling activities will take place, should be dug in a selective way and will be separately stored for a later use in revegetation activities.
- Measures should be implemented to prevent the entrance of pollutants into the hydrology and hydrogeology systems.
- Revegetation measures will be implemented as construction works are finished.
- Measures to protect fauna should include information to workers on protected fauna species existing in the area, scheduling of fauna disturbing activities to avoid breeding periods, , immediate restoration of any disturbance of the banks or river bed.
- Natural protected areas will be preserved by prohibiting earth borrowing sites, landfills, earth pilling, and camps; fencing natural protected areas that are near the construction site; prohibiting the construction of interim roads; if necessary, compensatory measures will be developed.
- Cultural values protection measures. According to the decisions obtained for subtasks within archaeological sites, an archaeologist shall be present at the construction site. All fossils, value

or antiquity coins, articles and structures and other remains or items of geological or archeological interest found on the work site shall be placed under the care and authority of the Employer. The Contractor shall, upon discovery of any such findings, promptly give notice to the Contract Engineer, who shall issue instructions for dealing with the finding.

- Reclamation of land occupied by construction camps, interim access roads, and other construction installations.
- Revegetation of the areas that have been devoid of vegetation and should be returned to their original conditions will be revegetated taking into account the original features of the vegetation that was removed. A revegetation project will be prepared.
- Mitigation measures should include the use of green or brownish colours to paint infrastructures, architectural style similar to that of the surrounding area landscaping.
- For the operational phase a progressive Odour Management Plan should be considered for the WWTP. Noise will be minimized with mitigation measures such as selection of equipment with low noise and vibration emission levels, self contained installation of the pumping equipments, underground installation of the pumping equipments, or establishing a green belt buffer around the stations.

Finally the implementation of a monitoring plan is recommended to ensure that the mitigation measures are adequately carried out and perform as planned.. Thus, the application of all or only some of the monitoring activities recommended in the study will depend on the size, features and location of the subtask for which the monitoring programme is to be designed.

13. EXECUTIVE SUMMARY

13.1 INTRODUCTION

The object of the Environmental Impact Assessment Statement presented herein is the Gdansk Water and Wastewater project, whose main goal is to adapt the Gdansk city water supply and sewage system to the city sustainable requirements. The implementation of this project will ensure that the requirements set by the Polish and European Union policies are met, and at the same time allows to fulfil Polish obligations resulting from the Convention on the Protection of the Marine Environment of the Baltic Sea Area.

The project itself consists of a total of 28 water and wastewater investments, all of which will be implemented in the city of Gdańsk, except one, which will be located in the neighbouring commune of Kolbudy.

The tasks connected with water management comprise the construction and improvement of 6 water treatment stations (Osowa, Lipce, Pręgowo, Dolina Radości, Zaspa Wodna, Zakonicznyn), the construction of new water mains (Osowa – Migowo, Orunia – Olszynka, Południe), the construction of the Kiełpino reservoir, the improvement and construction of a water pumping station and construction of new water network in the districts of Olszynka, Kokoszki, and the metering and monitoring system of the water supply system.

The tasks connected with the sewage management comprise 9 tasks concerning the extension of sewage system (new sewage networks in the district of Osowa-Barniewice-Klukowo, Zabornia, Jasień Wieś, Łostowice, Wyspa Sobieszewska, Orunia, Olszynka, Kiełpino Górne, Święty Wojciech), the closure of the Zaspa wastewater treatment plant, and the extension of the Gdańsk- Wschód WWTP.

In order to finance these investments, the City of Gdansk is applying for Cohesion funding. As required by the Cohesion Fund guidelines, all application or the Fund's assistance must include documentation concerning assessment of the project's environmental impact according to the requirement of Directive 85/337/EEC as amended by Directive 97/11/EC. In addition, the City of Gdansk has requested the European Bank for Reconstruction and Development (EBRD) to participate in the co-financing of this project. Accordingly with its policy, the EBRD requires that projects be structured so as to meet applicable national environmental law, and EU environmental standards, insofar as these can be applied to a specific project.

Although Poland has a long track record in EIA procedures, in the past, the EU has been concerned with the Polish approach to screening of Annex II projects and assessing the impacts on Natura 2000 sites, including those listed on the so called 'shadow list' prepared by NGO's. This situation, however, has recently changed with amendments to the Polish Environmental Protection Law, and one of the aims of this EIA statement has been to check that appropriate screening is undertaken.

Since the EU requires that the impacts of the entire project are assessed and not just its individual elements, as it is done under current Polish EIA procedure, an EIA such as the one presented herein is required that encompasses all of the concerns listed, and be fully in compliance with the EU EIA Directive as amended as well as Polish environmental regulations.

13.2 PROJECT SCREENING

The Poland Gdansk Water and Wastewater comprises 28 sub projects, of which 17 are related to drinking water management issues, and 11 are related to wastewater issues. Among the drinking water management projects there are a number of projects that involve the abstraction of groundwater and the construction of water pipelines, which are addressed in both annexes I and II of the European Union Directive 85/337/EEC as amended by Directive 97/11/EC. Likewise, among the wastewater projects, there are wastewater treatment plants and wastewater pipelines also addressed in these annexes of the Directive.

An assessment has been conducted to evaluate the screening process that Polish authorities have conducted on these projects. This assessment has involved checking that the process has followed EU screening criteria. For this, the following information has been reviewed:

- Application for Assistance for the Cohesion Fund 2000-2006. Annex I. Environmental Impact Assessment. The document provided includes the application as well as the attachments (Official Polish documents related to the process).
- Applications for environmental decisions regarding affection to Natura 2000 Network Areas.
- Responses from the Authority responsible for monitoring the Natura 2000 Network Areas.

13.2.1 Screening of Annex I Projects

The classification carried out by Polish authorities in Annex I, II or none was found to be appropriate. The two subprojects classified in Annex I are:

Subproject 05. Rebuilding of Lipce water intake and water treatment plant. This project involves an average water abstraction of 12.775.000 m^3/year.

Subproject 28. Extension of Wastewater Treatment Plant Gdańsk Wschód – step II b – sludge management, adjustment to stricter nitrogen removal requirements.

Subproject 05 involves the modernization of the existing underground water intake located in Gdansk-Lipce, Niegow and areas of commune Pruszcz Gdansk. The current working capacity of this water intake is 1.100 m^3/hour (9,636 million m^3/year), this is less than 10 million cubic meters per year. However, with the modernization of the water intake, the intake capacity is planned to be increased to 35.000 m^3/day (14,583 million m^3/year), this is over 10 million m^3/year.

Subproject 28 consists of the extension of a wastewater treatment plant with a capacity exceeding 150.000 population equivalent. It also involves the production of dried sludge in a granulated form at the treatment plant. This final product will be stabilized chemically and biologically. The projected production of dried sludge is of 37 tons/day 90% dry substance content, for 2008, and 48 tons/day 90% dry substance content, for 2030. This represents 370 tons/day and 480 tons/day, respectively as wet sludge. These capacities exceed the 100 tonnes per day threshold set in Annex I and, thus, the project should be included in this Annex.

13.2.2 Screening of Annex II Projects

The Environmental Protection Law Act of 27 April, 2001 has recently been modified by the Act of 18 May, 2005. Since the permitting process for the individual subprojects started in 2003, most of them were screened according to the specifications set in the 2001 Law. As a consequence of the article 10 of the 2005 amendment to the Environmental Protection Act, the screening process for these projects had to be revised in order to have an environmental decision issued taking into account the potential affections to Natura 2000 sites.

Screening results under the 2001 EPL act procedure

Under 2001 legislation, the screening process for those projects in Annex II resulted in the need to prepare EIA studies for subprojects:

10. Rebuilding of water intake and water treatment station Dolina Radości.

18. Extension of Wastewater Treatment Plant Gdańsk-Wschód-step III-connection of Wastewater Treatment Plant Zaspa discharge area.

26. Building a sewage system for Kiełpino Górne district.

Decisions on location of public projects have been issued for sub projects 10 and 26, and building consents for the sub tasks of sub project 18.

These documents and associated documents have been reviewed for these projects.

The review of these documents indicate that the EIA study for sub project 10 was requested because the project is located within Tri-city Landscape Park and close to the designed nature conservation reservoir "Meadows in Dolina Radosci". The documents do not provide very extensive information on

the exact criteria used to screen the project, but the location of the project in a protected area and the closeness to a landscape of cultural and archaeological significance, included in Annex III of the Directive, seem to be screening factors that would have determined the need for the EIA study.

The review of the screening procedure for task 18 revealed that the reasons for the need to prepare an EIA study were the size of the project, the need to provide works within the city center, and high groundwater levels.

In the case of task 26, the reason for the EIA study involved topographic features needing methods for preventing earth sliding.

Subprojects 14, 20, 21, and 23 were screened out because they are located in an area covered or to be covered by a local land use development plan. For the rest of the projects, no significant environmental features have been associated to them and, therefore, have not been considered to need an EIA.

Screening results under the 2005 amended EPL act procedure

Applications for environmental decision concerning the affection on Natura 2000 sites have been submitted for the subprojects. The information submitted with the applications was reviewed and was considered in compliance with the information requirements set in Polish regulations as well as in European guidelines and Polish procedures.

All the applications have been assessed by the authority in charge of the procedure leading to the decision concerning the environmental prerequisites of the project approval, the Vovoid of Pomerania. For each of the projects it has been considered that the project is not expected to exert any potential impact on Nature 2000 areas, considering the anticipated environmental impact of the planned project tasks at both their implementation and operation stages, and recognizing the fact that the sites are substantially distant from the closest Nature 2000 sites.

Despite the favorable decisions issued by the Vovoid of Pomerania, the Powiat Sanitary Inspektor, and the Provincial Nature Conservator, the European Commission has requested a duty of confirmation of EIA procedure for tasks 7 and 9, which involve the construction of a new treatment station and the extension of an existing water treatment station to treat groundwater already being abstracted, respectively. Unless, the European Commission would consider the treatment plants as an extension of the water intake, it is not considered that this project could be classified under Annex II. Nonetheless, GIWK has reapplied for environmental decisions on these projects, arguing the necessity of constructing the associated water and refuse water pipelines as the basis for a reapplication under Annex II project category AII-10j.

13.3 PUBLIC CONSULTATION AND DISCLOSURE PLAN

Public participation in the Polish EIA procedure is specifically regulated in the Environmental Protection Law (EPL) Act of 27 April of 2001. Article 53 of the EPL Act specifies that the body responsible for issuing the decision must ensure public participation in EIA procedures requiring EIA reports.

A Public Consultation and Disclosure Plan has been prepared and implemented for this EIA. It analyses international and national regulations and requirements on public participation, and defines the roles and responsibilities of those involved in the public consultation and disclosure process, the identification of stakeholders, the information disclosed, the means and timing of information disclosure, and the review and analysis of the consultation results. The PCDP comprises the following steps:

- Review of previous Public Consultation and Disclosure
- Identification of stakeholders
- Public consultation during preparation of EIA study
    - Organization of public hearings
    - Consultation to relevant authorities
- Public participation process for the draft EIA report
- Key issues identification and input of key issues into the EIA.

13.3.1 Review of previous Public Consultation and Disclosure

This task consists of the review of all the information that in association with the development consent process of the subprojects carried out to date, are related to the public consultation and information disclosure activities, as required by Polish regulations.

For several years already, the Gdańsk Infrastruktura Wodociągowo – Kanalizacyjna Ltd. company has been running a dialog with the public opinion concerning the preparation of the tasks planned within the Gdańsk Water and Wastewater Project. In this context, within the last three years, several articles dealing with water and wastewater management issues have been published in the local press ("Dziennik Bałtycki", "Głos Wybrzeża", "Gazeta Wyborcza"), and two special supplements of "Dziennik Bałtycki" have been published, informing about the issues of the drinking water quality and wastewater management in Gdańsk, and the planned solutions. These issues have also been discussed on the Forum of Local Agenda 21, created in 1997-1998, which is a platform for public consultation of the strategy of the city development.

In the context of the administrative EIA procedure, public participation in Poland, is conducted only in

those cases that require the EIA report. With regards to projects in Annex II screened and determined not to need further environmental assessment, the regulations specify that the public should be notified about the decision on the lack of obligation to prepare the report.

In the two cases (tasks 05 and 28) where an EIA was required because of their classification in Annex I, the EIA report was submitted together with the application for a location decision of a public investment, and both entered into publicly accessible data registries and announced in the Internet by the President of the City of Gdansk. In the three cases where Annex II projects were required an EIA (tasks 10, 18, 26), the president of the City of Gdansk first issued decisions requiring the need to carry out an EIA study, which were entered in publicly accessible data registries. For these projects, an application for location decision was entered into the publicly accessible data registry. The decision on the need to carry out an EIA study and the EIA report, were then made public at the same time. The announcements of entering the application, the EIA report and the decision into the publicly accessible data registry were then posted on the Internet by the President of the City of Gdansk.

In all five cases, public consultation was conducted once the EIA report was submitted.

13.3.2 Public Consultation During Preparation of the EIA Study

The open public hearings were conducted on 07 October 2005, 16 November 2005 and 26 January 2006 with non-governmental ecological organizations cooperating under the Gdańsk Agenda 21 project and official organisms that are giving opinions about environmental decisions. Also a consultation to relevant authorities was carried out.

The key issues identified during the public participation processes mainly concern aspects associated to subprojects 10, 16, 18 and 28. These are:

Public concern on groundwater issues, both regarding the availability of water resources as their vulnerability Specific issues were raised regarding Czarny Dwór, Zaspa and Dolina Radości water intakes.

Significant concern has also been observed for the problem of groundwater raising levels in the lower terrace of Gdánsk.

Landscape and nature conservation are as well issues of concern, in particular, the rebuilding of the water intake and water treatment station Dolina Radości (task 10), and the building of the new pumping station and the water reservoirs in the area of Orunia (task 16).

The possibility of decommissioning the Straszyn surface water intake is positively viewed by the inhabitants of Gdansk.

The need for preventing the affection of any protected areas, especially Natura 2000 sites, has been stated by the authorities consulted.

Finally, secure utilization of the sewage sludge, has been requested.

The issue on fees to be imposed at the Sobieszewska Island, was also an important concern, although not strictly an environmental one.

13.4 SCOPING PROCESS

A scoping study has been undertaken to establish the main features of the proposed Gdánsk water and wastewater projects to identify the main environmental sensitivities and constraints within the project area. Scoping issues identified and to be considered in the EIA were as follows.

No scoping issues were raised by the consulted authorities for tasks 05 and 28, included in Annex I, this being in compliance with Polish regulations, which do not require the authorities to provide a scoping unless this is requested by the developer.

No scoping issues have been raised either for tasks 01, 07, 09, 13 and 15, not included in either Annex I or II.

For tasks 10, 18, 26, included in Annex II, an EIA was required by the authorities. The following scoping issues were raised:

Task 10: mitigation measures requested for this project include minimization of landscape impacts, construction of buildings matching the landscape, reducing scale of building site, and avoiding vegetation season, water intake limited to 300 m^3/h, performing hydrological investigations on existing sink depression.

Task 18: Concern on the size of the project, the need to provide works within the city center, and presence of high groundwater levels were identified.

Task 26: The EIA was required for step V, due to the existence of topographic features that may pose sliding risks. It was established the need to perform analyses for preventing earth sliding. For step IV, no major environmental issues were observed.

For the rest of the tasks of Annex II, no EIA was required. However, general environmental issues have been addressed for all of these projects, that are applicable to all the tasks of the project. These general issues include:

- Contribution to noise and dust emissions from construction machineries, transportation machineries, and earth works during the construction phase;
- Implementation of protection and revegetation measures for vegetation;

- Reduction of land use during construction works;
- Implement secure waste management;
- Use tight-proof building materials to avoid migration of sewage;

Specific environmental issues have been identified for some of the tasks. The most relevant are:

Task 11. Assessment of most effective conditions for placing new infrastructure.

Task 16. Citizens are concerned that the infrastructure to be built in this site will destroy or endanger the Dolina Potuku Orunskiego park.

Task 21. Some part of the sewage route crosses an archaeological protection zone. All soil works in this area should be supervised by archeologist.

Task 22. Some interference and disturbing of private ownership.

Task 25. GIWK is the owner of the areas for pumping stations.

Task 27. The Channel of Radunia river, registered as historical monument, is located in the project area, as well as the suburban rural complex of Sw, Wojciech, protected by Voivodship Cultural Heritage Conservator. A part of the protected area is under archaeological observation. All works in protected areas shall be agreed and conducted under the supervision of competent authorities.

In addition, in the context of this project and the public information that has been carried out as part of the scoping process, citizens have raised concern about the problem of groundwater raising levels in the lower terrace of Gdansk. Concern has also been raised about the potential pollution of the Czarny Dwór water intake, which is not part of this project, but nonetheless, should be taken into account.

13.5 DEVELOPMENT OF PROJECT AND ALTERNATIVES

13.5.1 Alternatives Considered

Water Supply

Six options for the sources of water supplies and development of the distribution system were considered.

Option I Operation of ground and surface water intakes generally as now (some local stations decommissioned), industrial intakes operated as now.

Option II-A Surface water intake Straszyn decommissioned, central system groundwater intakes operated at maximum capacity, water purchased from Sopot, industrial intakes operated as now.

Option II-B Like II-A but no purchase of water from Sopot, new water intake and treatment station Zakoniczyn constructed.

Option III Surface water intake Straszyn operated near maximum capacity, some central system ground water intakes operated to make up balance, industrial intakes operated as now.

Option IV Like to Option III, but shoreline groundwater intakes decommissioned and inland groundwater intakes operated at maximum capacity.

Option V Only large groundwater stations operated together with surface water system, industrial intakes operated as now.

Option VI Existing local groundwater intakes for industry decommissioned, industry supplied from surface water intake (the costs were found to be very high and this option was not been considered further).

Wastewater Management

Sewage network

Nine networks will be constructed: Osowa-Barniewice-Klukowo; Zabornia Quarter; Jasien-Wies; Lostowice; Sobieszewska Island; Orunia; Olszynka; Kielpino Gorne; Swiety Wojciech Quarter

Extension of Gdańsk – Wschód WWTP – phase III – connection of Zaspa WWTP drainage basin (closure of WWTP Zaspa)

The options that were examined are summarised below:

<table>
<tr><th colspan="2" rowspan="2">Task name</th><th colspan="2">Examined options</th></tr>
<tr><th>Option I</th><th>Option II</th></tr>
<tr><td rowspan="3">Task1</td><td>Sec. A</td><td rowspan="2">Utilization of existing gravity sewers by loose relining</td><td>Construction of new pipes in an open trench system</td></tr>
<tr><td>Sec. B</td><td rowspan="2">Construction of new pipes using microtunneling method</td></tr>
<tr><td>Sec. C</td><td>Utilization of existing gravity sewers using “insituform” method</td></tr>
<tr><td colspan="2">Task 2</td><td>Crossing located above canal Na Stępce</td><td>Crossing under bottom of canal Na Stępce</td></tr>
<tr><td colspan="2">Task 3</td><td>Liquidation of objects down to 1,5 m below ground level</td><td>Total liquidation of objects</td></tr>
</table>

Analysis of the three tasks for the closure of wastewater treatment plant Zaspa shows that, in all cases, Option I is the preferred option.

Extension of WWTP Wschod (phase IIb) to improve nutrient removal

The options presented for the modernisation of Gdansk Wschod WWTP are to include or not to include a separate treatment plant (SHARON) for high strength sludge liquors. The inclusion of this separate plant would only be necessary if there was a shortage of treatment capacity, but the Wschod plant actually has surplus capacity.

Sludge Management

Three basic sludge management options were considered as follows;

Option I Disposal of dewatered sludge plus electricity generation from biogas.

Option II Thermal drying of sludge to form a granulate but no electricity generation from biogas.

Option III Thermal drying of sludge to form a granulate plus electricity generation from biogas.

Option I (the present disposal system) is the most favourable economic solution. This disposal method will be maintained as long as it is feasible, however, there are doubts as to the long term sustainability of this Option.

Option III with improvement in biogas generation of at least 25% is the next most favourable solution. It should be the alternative selected when Option I is not sustainable anymore.

13.5.2 Description of the Project

The following tasks have been projected:

Water supply

1. *Construction of a metering and monitoring system for the Gdańsk Water Supply System*. This involves the installation of metering equipment on existing pipelines.
2. *Construction of Kiełpino water reservoir* This will be combined with rebuilding of the Migowo pumping station and construction of water mains to connect the Kiełpino water reservoir with the central Gdańsk water supply system.
3. *Construction of water treatment station Osowa* This project consists of the reconstruction of the sanitary sewerage system and sewage pumping station for collection of backwashings from the filter plant and for the reservoir drainage system.
4. *Construction of water main connecting Gdańsk-Osowa with the central Gdańsk water supply system* The scheme comprises ductile iron water mains for Osowa-Barniewice urban units in Gdańsk-Zachód quarter.

5. *Reconstruction of Lipce water treatment station* This task provides the construction of a new main building at the Gdańsk-Lipce station, and modernization of existing underground water intake.

6. *Construction of water main supplying Orunia-Olszynka area from Lipce water intake.* The works will be in the urban unit of Orunia-Olszynka in the following areas: Olszynka, Dolne Miasto.

7. *Treatment of water from the Pręgowo water intake*. A new treatment station will be constructed for water from the Pregowo intake in the vicinity of existing intake in Pręgowo.

8. *Construction of water main for quarter Południe* For areas located between Świętokrzyska and Starogardzka Street, and the Gdańsk borders with communes Kolbudy and Pruszcz Gdański.

9. *Extension of water treatment station Zaspa Wodna*. The existing station is located at the Wrzeszcz quarter, at the Zaspa-Rozstaje housing estate in Gdańsk. The scope of the project includes metering of water intake, construction of treatment units, treated water reservoir, water pumping station for supply of water to the water supply network, and new infrastructure required by the station.

10. *Reconstruction of water intake and water treatment station Dolina Radości* The task covers: construction of pumping station, installation of water UV disinfection system, modernization of existing units and station technical infrastructure.

11. *Water supply of Kokoszki-Bysewo area*. This project involves construction of water to facilitate two-way water supply of the residential area of the Kokoszki urban unit, and the pipeline water main in Rakietowa Street.

12. *Construction water pipeline in Żuławy - Olszynka area*. The works are located in an area of the Gdańsk-Olszynka quarter. This local water supply system includes water mains plus connections to housings.

13. *Re-commissioning of Stara Dolina reservoir*. This project provides for repair, reconstruction, and re-commissioning of the existing water reservoir, which has not been used for a number of years.

14. *Construction of water treatment station Zakoniczyn*. The new water treatment plant will be built at the site of the 2 existing boreholes "Łostowice" intake that currently are not used. This tasks involves using the 2 existing wellbores, and drilling 2 new wellbores.

15. *Reconstruction of water pumping station Ptasia* This project includes installation of extra pumps for pumping of water to area of storage reservoir Migowo.

16. *Construction of new pumping station in the area of Orunia reservoirs, plus construction of two water reservoirs* The project comprises two new reservoirs, which capacity of 5.000 m^3 each, and a new pumping station with a capacity of 40.000 m^3/d.

17. *Construction of water supply network and new pumping station Sobieski*. This task comprises the construction of a water pumping station for Orunia and Migowo reservoirs and a pipeline for delivery of water to Migowo reservoirs.

Wastewater management

18. *Extension of Wastewater Treatment Plant Gdansk – Wschod – connection of Zaspa WWTP basin*

    The project "Closure of Zaspa sewage treatment plant" is composed of three interdependent tasks:

    Task 1 – Reversal of the Zaspa sewage treatment plant sewerage system to pumping station Ołowianka.

    Task 2 – Construction of the second pressure sewer line, Ołowianka II, from pumping station Ołowianka to Sewage Treatment Plant Wschód.

    Task 3 – Demolition of the decommissioned objects of the Zaspa sewage treatment plant.

19. *Sewage system Osowa – Barniewice – Klukowo* This task provides the construction of a trunk sewer delivering sewage to the existing Bysewo sewage treatment plant that is subject to modernization.

20. *Sewage and storm water system for Zabornia district* The new housing estates in this area are not connected to the sewerage system. Gravitaty and pressure pipes will be placed.

21. *Sewage system for Jasień Wieś* In the Jasień quarter, that neighbours on Zabornia, there are similar problems. Their solution requires construction of sanitary sewers and house connections.

22. *Sewage system for Łostowice district* No organized sanitary sewerage system exists in this quarter. Solution of this problem requires construction of PVC sewers and house connections.

23. *Sewage system for Sobieszewska Island* Construction of complete sewerage system for the Sobieszewska Island requires 5.700 m of sanitary sewerage network, 200 house connections (up to property boundaries), 1.000 m of pressure pipelines and 5 complete sewage pumping stations.

24. *Building of sewage system for Gdansk – Orunia* Plans provide for construction of 4.500 m of street sewerage network, 170 house connections (up to property boundaries), 3 pumping stations and 900 m of pressure pipelines.

25. *Building of sewage system for Olszynka district* Construction of 9.600 m of street sanitary sewers, 400 house connections (up to property boundaries), 5 pumping stations and 1.700 m of pressure pipelines is required.

26. *Building of sewage system for district Kiełpino Górne* Construction of 15.800 m of sanitary sewers, 700 house connections, 2 pumping stations, and 750 m of pressure pipelines.

27. *Sewage system for districts Święty Wojciech , Lipce and surrounding areas* Construction of 15.200 m of gravity sewers, 900 house connections, 3 pumping stations and 600 m pressure pipelines.

28. *Extension of WWTP Gdansk Wschod – stage II b – sludge management, more strict nitrogen removal requirements* The modernization of the Sewage Treatment Plant Wschód is to achieve the following two main objectives: treated sewage concentration of N_{og}<10mg/l, and a satisfactory method of final disposal of sludge.

    Improvement of pretreatment requires replacement of ineffective screens by modern fine screens fitted with screenings-flushing and screen-washing system using treated sewage, supplemented by screw press for transport and dewatering of screenings. The next activity should be targeted at improved removal of inorganic solids and grease in the grit chambers. Achievement of this objective requires construction of new, properly designed grit chambers and reconstruction of the existing ones. The project will include Band screens, Aerated grit chambers, Digester (hydrolyser) of pretreated sludge after redesigning, Primary settlement tanks, Introduction of classic Bardenpho process to the bioreactors, Increase of internal circulation intensity in bioreactors, Installation of methanol batching system, and Reconstruction of skimmer for skimming and collection of float from secondary settling tanks.

13.6 ENVIRONMENTAL BASELINE

The city of Gdańsk is situated on the left hand side of the Wisła River where it joins with Gdańsk Bay. Its specific geographical location, covering the four distinct and diversified geo-physical regions of Żuławy Wiślane, Pobrzeże Kaszubskie, Mierzeja Wiślana, and Pojezierze Kaszubskie, causes a limitation in the spatial development of the town. This limited spatial development is reflected in the fact that a considerable part of the city consists of natural areas with various forms of nature protection.

The town of Gdańsk is adjacent to the Gdańsk Bay. To the East it breaks into the area of the Vistula River delta (Wiślane Marshland), to the Southwest it borders with the edge zone of the Kaszubian Lake District, which constitutes a strong barrier for the town development due to the height differences reaching as much as over 100 m. To the North, Gdańsk borders with the town of Sopot.

The area of Gdańsk can be characterized also as having a specific hydrographic system. Gdańsk western part is located in stream catchments flowing from the edge zone. The water courses in this area have the features of mountain streams in the higher lands, next they flow through the urban areas of the town, and finally form estuaries in the Gdańsk Bay. On the other hand, the eastern part

of the town is located in the Vistula River Delta which is water-logged and exposed to flood hazards. Surface waters, this is streams, rivers and canals, as well as the Gdańsk Bay, are the receivers of the rain water run off discharged from the town area and the adjacent communes. The Gdańsk Bay is the receiver of the purified sewage from the existing urban Gdańsk-Wschód and Zaspa wastewater treatment plants (WWTP). The purified sewage from Gdańsk- Wschód WWTP is discharged deep in the Gdańsk Bay at a distance of 2,5 km off the shore.

The hydrographic system in the Gdańsk area include the Wisła River, with three estuaries flowing in the city and its outskirts (Martwa Wisła, Wisła Śmiała and Przekop Wisły); the estuary of the Motława River, Strzyża (Bystrzec Stream I), with numerous tributaries, the more significant being Jasień stream, Jaśkowa Dolina stream, Bystrzec II stream, and Matarnicki stream; the Radunia River; the Strzelenka stream, the Święty Wojciech; the Maćkowy Stream; the Oruński Stream; the Siedlecki Stream; the Oliwski (Jelitkowski) Stream. There is also a number of polders, which form the hydrographical system of Gdańsk fenland, namely the Orunia polder; the Niegowo polder; the Olszynka polder; the Rudnicki polder; the Przejazdowo polder; the Rafineria polder; the Płonia polder, and the Wyspa Sobieszewska. There are a few lakes within the administrative boundaries of the city, the larger ones being Ptasi Raj and Karaś on Wyspa Sobieszewska, Pusty Staw lake in Stogi district, Jasień lake at Trójmiasto Ring Road in the south-western part of the city, and some sections of Osowskie and Wysockie lakes in the north-western part of the city. There are also numerous ponds and water reservoirs of various sizes.

The quality of surface waters from the physical and chemical as well as bacteriological point of view is slowly and systematically improving. Also the Gdańsk Bay waters may be characterized as having a favorable trend of change, although at present it is still difficult to clearly assess the range of these changes due to high concentration of nutrients, which cause water eutrophication.

The contact of the town with the edge of the high plain (Kaszuby Lake District) and the location on the shore, causes a considerable amount of water (both underground and surface waters) to flow into the so called lower terrace of Gdańsk-shoreline, with a tendency for groundwater levels to raise. Other factors contributing to the increase in the groundwater table is an increased flow of rainwater from the developed areas, a decrease in the abstraction of water from underground intakes (as a result of the construction in the 70s a surface water intake in Straszyn, as well as a decrease of water consumption), and a low efficiency of melioration systems.

The areas with the risk of flooding are fragments of downtown area of Gdańskie Żuławy and in the shore belt (Lipce, Kolonia Uroda, areas along Urban intakes Czarny Dwór and Zaspa). The occurrence of floods constitutes a hazard to the buildings as well as to the quality of underground water.

The Gdańsk area is abundant in usable underground water resources. It is located over the groundwater reservoir (GZWP) No. 111 Subniecka Gdańska. This Cretaceous formation, well isolated from the surface, lying at a depth of about 150 m, has estimated available resources of 110.000 m^3 per day. The second main reservoir is GZWP No. 112 Gdańskie Marshland, whose Quaternary waters lie on depths ranging from a few to 40 meters. The estimated available resources of this aquifer are 116.000 m^3 per day. The waters of this reservoir are not well isolated from the surface influence and hence they are rather vulnerable to surface pollution. Because of this, a protection zone has been allocated for GZWP No. 112, which introduces limitations in spatial development within the protection zone.

In 2004, the Technical University of Gdańsk prepared the study "Strategy of Development of the Gdańsk Water Network", where it was stated that the groundwater resources in the Gdańsk area are sufficient enough for the future needs of Gdańsk, exceeding in an 80% such needs. It was also stated that the present production capacity of the 17 working groundwater intakes exceeds by 47% the needs estimated for 2015.

The town of Gdańsk is located in the Vistula River Delta, which together with the adjacent natural formations, namely the delta bar, the high plains, the Gdańsk Bay, and the Vistula Lagoon, is one of the most important ecological knots of this part of the European Continent. The importance of this knot is highlighted by the Vistula River Valley, which all along its course plays the role of an ecological corridor of international importance. The significance of this area is reflected in the numerous forms of environmental and landscape protection established within the town of Gdańsk, and within the area of the adjacent communes belonging to the catchment of the Gdańsk –Wschód WWTP. Within this area there are four nature conservation reservoirs, one landscape park, three areas of protected landscape, and two nature and landscape complexes. In the town of Gdańsk, the town of Sopot, the town and the commune of Pruszcz Gdański, and the commune of Żukowo and Kolbudy, there are the following Natura 2000 sites: PLB 220004 Ujście Wisły, PLB 040003 Dolina Dolnej Wisły, PLB 220005 Zatoka Pucka, PLH 220030 Twierdza Wisłoujście, PLOB237 Ujście Wisły.

One of the most important protected areas in the area of Gdańsk is the Tri-city Landscape Park, which occupies an area of 19.930 ha within the urban districts of Gdańsk, Sopot, and Gdynia, the city and municipality of Wejherowo, the municipality of Szemud, and the city of Rumia. The park covers a fragment of the north-eastern area of the Kaszubskie Lakeland. It represents an undulated plain of a ground moraine, rising on average 60 m above the level of the sea, which in the East ends with an upland escarpment zone. A distinct characteristic of the Park's landscape is a well-preserved, diversified topographic profile of the lakeland escarpment zone with erosive clefts creating branched valley systems. Approximately 90% of the Park area is covered by forests, which belong to the Forest

Promotional Complex "Oliwsko-Darżlubskie Forests". Nearly all types of lowland forest sites are present here, from woods to alder swamp and marsh forests. Fields, fresh and wet meadows, and pastures communities are significant among non-forest vegetation in the Park. Communities growing in wellhead areas, high and transitional peat bog communities and water communities of Lobelia lakes (in the northern part) constitute a valuable component of vegetation. Habitat diversity warrants a wealth of flora species, many of them protected. The fauna of the park is characteristic for the Polish Lowland. Large mammals, such as wild boar, roe-deer, and deer inhabit this area. Elk migrates through this territory sporadically. Hare, wild rabbit, squirrel, fox, badger and other animals have also been spotted in the area. The bird fauna is also important with a number of rare bird species breeding in this area. The historic urban complex of Stara Oliwa and the complex of Oliwskie Valleys border the southern area of the park. The remains of a historic complex of mills and forges have been preserved in the Oliwski Stream Valley. A former Cistercian monastery complex constitutes the most valuable monument of architecture near the park, with a gothic cathedral, a convent, two abbey palaces, and a park.

With regards to the cultural environment, Gdańsk is a city with a long and traditional development, with many historical and cultural values, not only at the Polish scale, but also at the whole of Central and Eastern Europe. The Gdańsk area has 365 registered historical objects. These include urban, rural and military arrangements, courts and palaces, parks and cemeteries, national memorials, industrial units and warehouses, water engineering infrastructure, sacred architecture, buildings of public utility, and dwellings. These are mostly concentrated in the older settlement regions such as the city centre and Oliwa. Apart from the registered historical relics, there are also many cultural artefacts, which are not registered. These include housing developments, industrial, military and archaeological sites as well as single buildings. Non-material objects, such as street names, districts, villages, waters and high elevation points are important elements as well.

13.7 IMPACT IDENTIFICATION AND ASSESSMENT

13.7.1 Impact Identification Methodology

The process of impact identification has been based on the identification of the activities/aspects of the project and the environmental components, which could be affected by those activities/aspects.

Each project activity was examined to firstly find out which of the aspects were relevant and, if so, whether they would be large or small in magnitude. Secondly, to identify which environmental components and receptors could potentially be affected by each activity.

The following table summarises the project actions which are likely to cause an environmental impact.

Project Actions likely to have an impact on the environment				
Construction Phase	**WATER SUPPLY SYSTEM**			
	Pipeline networks	Trenching	Earth moving and clearance of vegetation; Access roads; Construction camp; Temporary land taking.	Tasks 02, 03, 04, 05, 06, 08, 10, 11, 12, 17
	Pumping stations, reservoirs and water treatment stations	Technical infrastructure; Storage reservoir/tanks	Earth moving and clearance of vegetation; Access roads; Construction camp; Waste generation; Permanent land taking.	Tasks 02, 03, 05, 07, 09, 10, 13, 14, 15, 16, 17
	WASTEWATER SYSTEM			
	Sewage network and storm water system	Trenching	Earth moving and clearance of vegetation; Access roads; Construction camp; Temporary land taking.	Tasks 19, 20, 21, 22, 23, 24, 25, 26, 27, 18
	Pumping stations and Wastewater Treatment Plant	Technical infrastructure	Earth moving and clearance of vegetation; Access roads; Construction camp; Waste generation; Permanent land taking.	Task 19, 21, 23, 24, 25, 26, 27, 28
	Demolition of decommissioned objects of Zaspa WWTP		Earth moving; Construction camp; Waste generation (asbestos); Temporary land taking.	Task 18
Operation Phase	**WATER SUPPLY SYSTEM**			
	Pumping stations, reservoirs and water treatment stations	Presence of buildings, reservoirs, banks.	Permanent land taking;	Tasks 02, 03, 05, 07, 09, 10, 13, 14, 15, 16, 17
	Drinking water system	Presence and operation of water pipelines	Ring layout of drinking water system	Tasks 01 to 17
	WASTEWATER SYSTEM			
	Wastewater Treatment Plant Station	Building presence and operation	Permanent land taking; Odours; Noise; Effluent.	Task 28
	Wastewater sewage system	Presence and operation of wastewater pipelines	Elimination of cesspools	Tasks 19 to 27

The environmental resources/receptors susceptible to be impacted are:

Environmental components	Effects
ATMOSPHERE	Air quality affection
SOIL	Soil quality alteration
HYDROLOGY	Inland water surface quality affection
HYDROGEOLOGY	Groundwater quality affection
FLORA	Loss of vegetation
FAUNA	Loss of habitat Disturbance to populations
PROTECTED AREAS	Loss of habitat within the protected areas
LANDSCAPE	Visible changes in the landscape
HERITAGE AND HISTORIC RESOURCES	Damage to historical/archaeological objects
HUMAN RESOURCES	Annoying odours, noise and disturbance of routine life activities Improvement of conditions of seaside resorts, water supply system rationalization, revitalization of degraded areas, city development

Once the impacts have been identified, the next step is to ascertain their significance and their magnitude.

For defining the impact significance, the following features of the impact are assessed: Positive / Negative; Direct / Indirect; Cumulative / Synergistic / Simple; Permanent / Temporal; Resilient / Recoverable / Reversible. The significance of the impact is classified as low, medium and high.

The magnitude of impacts is estimated using quantitative approaches when possible, and qualitative approaches based on expert opinion.

The value of the impact is estimated as the result of its significance and its magnitude, and is defined as follows:

- Low (compatible)
- Medium (moderate)
- High (severe)
- Critical

An aim of the EIA is to get to a position where the project does not have any major residual impacts, neither to endure into the long-term, or extend over a large area.

For positive effects, the impact on each environmental factor has been directly assessed by a panel of experts using the following scale of importance values:

- +3 high positive impact
- +2 medium positive impact
- +1 low negative impact

13.7.2 Assessment of Environmental Impacts

This analysis will be performed considering the two phases: construction and operation.

CONSTRUCTION PHASE

Atmosphere

Impacts on air quality

Combustion gas emissions (CO, NOx, HC) from machinery and vehicles

dust emissions from earth movements, excavation, and hauling

Impacts on noise levels

Noise and vibrations from the operation of heavy construction machinery and transport vehicles.

Short terms impacts considered non significant with the application of sound environmental prevention practices.

Geology

Geomorphological changes due to the creation of artificial talus or banks in areas where buildings and other infrastructures are built in a steep slope of the terrain. These geomorphological changes could eventually cause stability problems in terrain (i.e. sliding risks).

Significance: high

Magnitude: low

Impact: medium (moderate)

Tasks 10, 13, 16, 26 and 27 are located in areas of steep slopes, where geomorphologic changes could cause stability problems.

Soil

Soil impacts will be generated in those areas where either pipe network or the building construction works are located in unpaved areas. This impact has been considered as not significant with the application of preventive measures regarding topsoil management.

Surface water

Water quality

Suspended solids and fuel and grease contaminants in effluents from trenches, treated wastewater and run off from the construction camp and other construction work sites, and accidental spillages or leaks.

Considered as non significant with the application of appropriate prevention measures.

Physical disturbance of the water course

Disturbance of the water course will take place through physical works where there is a need for crossing the water course.

Significance: low

Magnitude: low

Impact: low (compatible)

Tasks 04, 06, 08, 12, 18, 23, 26, 27 and 28 cross rivers, streams or melioration trenches.

Hydrogeology

Groundwater from the upper Quaternary aquifer in the project area is vulnerable to contamination and does not have an stable quality.

Impact to groundwater quality of the Quaternary aquifer has been considered important in the context of existing impacts, and mainly considering the one of the aims of the project, improving drinking water supply

Groundwater pollution could take place during construction activities such as excavation and construction camp activities.
Significance: high

Magnitude: medium-low

Impact: medium (moderate)

Groundwater may potentially be affected by all the tasks. Distance to groundwater is quite short, however, contaminant lixivation, intensity and duration are low. Approximately 25% of the project tasks are over the aquifer vulnerability area.

Flora

Construction will result in the removal of trees, shrubs and other vegetation along the pipelines routes, the pumping station land lots, and the water and wastewater treatment station sites. Other agents that may deteriorate vegetation in the vicinity of the construction site are dust from excavation

and earth movements, accidental hits by heavy machinery or vehicles, and dryness when naked roots are exposed.

Significance: medium

Magnitude: low

Impact: medium-low (compatible).

In order to determine the percentage of affected vegetation, the surface of each of the types of vegetation present in the areas affected by the project tasks has been calculated. The vast majority (93,70%) of the vegetation affected by the project tasks is either cultivated land or pastures, the forested areas representing only 6,30% of the total affected vegetation.

Fauna

Construction activities are known to affect the fauna either by eliminating individuals and animal shelters, or by interfering with their activity patterns.

Significance: medium

Magnitude: medium.

Impact: medium (moderate).

The fauna present in the task 10, 13 and 23 area is rich and varied, the majority associated with forest complexes. Tasks 10 and 13 are completely located within forested areas. Tasks 04, 23, 19 and 11 also may affect wood areas. Part of the pipeline path for task 23 runs along the limit of the special bird protection area PLB 220004 Ujscie Wisly (Vistual Estuary). The rest of the projects are situated mainly in urban areas or rural areas with pastures or cultivated land, where fauna is less rich and diverse. Construction activities may cause the destruction of a limited number of localised individuals within a population over a short time period (less than one generation) and a transitory displacement of populations, without this affecting the abundance or distribution of the populations present in the project area.

Protected Areas

This impact refers to affections to areas that are protected due to their ecological values. Some of the tasks of the project happen to be situated in or near protected areas, including Natura 2000 network sites. Protected areas can be affected if there is temporal or permanent land taken, implying a loss of ecological values. Traffic and access roads could also affect them.

Significance: medium

Magnitude: medium

Impact: medium (moderate).

Tasks 10 and 13 are located inside the Tri-city Landscape Park (Trójmiejski Park rajobrazowy) and task 16 in vicinity of Natural Landscape Protected Area of the Valley of the Orunia Stream (Dolina Potoku Oruńskiego).

The surface affection for tasks 10 and 13 has been estimated in 69.020 m^2. This corresponds to less than 1% of the total surface of the park. The surface affection of task 16 has been estimated in 36.273 m^2. Task 16 will not imply any direct land taking of the protected area because it is outside its limits, but is, nonetheless, very close to it and some disturbance to the natural values is expected.. Task 23 will not imply any land taken of Natura 2000 site PLB 220004 Ujscie Wisly, but some nuisance to the fauna inhabiting this protected area is not discarded during construction works.

Cultural Heritage

The cultural heritage comprises a wide and varied set of historical and cultural goods, whose conservation may be directly or indirectly affected by the construction works. Thus, the construction activities that could generate an impact on the cultural heritage are those implying excavation or other types of earth movements, since they could destroy buried archaeological remains.
Significance: high

Magnitude: medium

Impact. Medium (moderate)

Tasks 06, 10, 18, and 27 are located in areas classified as cultural heritage sites.

Task 27 crosses the Channel of Radunia river and also affects to the suburban rural complex of Sw, Wojciech. The area is under archaeological observation.

Task 21 is reported to cross an archaeological protected area.

Landscape

The landscape of Gdánsk is one important feature, highly valued by its inhabitants. This is reflected in the fact that many areas of the city and its surroundings are protected on the basis of their landscape values.

The construction period will be relatively short and the land surface excavated relatively small. For most of the tasks, the landscape will return to its original conditions with adequate reinstatement measures, this impact will be considered non significant during the construction phase, but is assessed in the operational phase.

Other Impacts during Construction Phase

Hazardous waste management: asbestos waste

Task 18 involves, among other activities, the demolition of the decommissioned objects of the Zaspa sewage plant. This plant was built in the thirties and, therefore, there is a high likelihood, asbestos was used in construction materials. Removal of asbestos cement pipes as well as roof made of asbestos may negatively impact the environment and particularly the health of workers if adequate safety measures are not applied. The need to take such safety measures is strictly regulated by EU Directives and Polish legislation. This impact shall be considered non significant, but safety measures set in regulations should be strictly followed.

Annoyance to residents by the presence of construction works

Construction works in urban areas will likely imply traffic problems mainly due to streets cuts and traffic detours. In rural areas, the construction of pipelines passing through private properties may interfere with agricultural activities. This impact is considered non significant, but the construction works plan will need to take into account these aspects in order to minimise these annoyances,

OPERATIONAL PHASE

Once operational, the whole project will have a major positive impact on the environment as it will allow a great improvement in surface/sea water quality. This improvement will be gradual through time according to the project implementation. Nevertheless, some environmental impacts have to be considered.

Landscape

Impacts on landscape and visual amenity will potentially occur as a result of the operational phase (presence of buildings, reservoirs, and talus).

Significance: medium

Magnitude: medium

Impact: medium (moderate).

Several of the project tasks affect areas protected for their high landscape values. These are:

Tasks 10 and 13, located within the Tri-City Landscape Park;

Tasks 03, 04, 11, 17, and 19, located partially or entirely within the protection zone of the Tri-City Landscape Park;

Task 05, located within the Protected Landscape Area of the Delta of the Wisła River (OChK Żuław Gdańskich);

Task 23, located within the Protected Landscape Area of the Sobieszewska Island (OchK Wyspy Sobieszewskiej);

Task 16, is not located within the protected nature and landscape complex Valley of the Orunia Stream (Dolina Potoku Oruńskiego), but it is practically surrendered by the protected area;

Task 26, located in the vicinity of the Otomiński Protected Landscape Area.

Landscape affected by tasks 04, 11, 13, 17, 23 and 26 will be temporarily impaired during construction works, but after these are completed, with adequate revegetation measures, the landscape will return to its original conditions.

Tasks 03, 05, and 17 introduce noticeable new features into landscapes of high value.

Impacts from Odours

The operation of a wastewater treatment plant often results in the emission of odours offensive to plant personnel and the neighbouring community. Areas of the WWTP such as the bar racks, screens, settling tanks, aeration tanks, and sludge units are all potential sources of odours.

Significance: medium

Magnitude: high

Impact: medium- (moderate)

The area immediately surrounding the Gdańsk Wschód wastewater treatment plant consists of industrial facilities, mainly represented by the Gdansk refinery, at less than 500 m East of the current plant, some warehouses and office buildings, and agricultural land and pastures to the North, South and East. , In assessing this impact it has to be taken into account that the project also involves the dismantling of the Zaspa wastewater treatment plant, currently affecting a densely populated area of the city of Gdánsk, which will be a positive effect, offsetting this negative impact.

Noise and Vibration

This impact is not considered as significant since the design of the stations, in most cases underground facilities, should incorporate the necessary noise and vibration abatement measures.

Positive impacts

Surface Water Quality

Wastewater tasks will have a positive impact on the quality of surface water.

Groundwater Quality

Task 1 (building of a measuring and monitoring system for the Gdansk Water System) has been assessed as having a positive impact since it will allow to manage groundwater use in such a way as to reduce pollution risks.

All wastewater tasks will have a positive impact.

State of Seawaters and Seaside Resorts

Those sewage network tasks closer to the shoreline have been considered to have a positive impact, The Zaspa WWTP (task 18) will have a positive impact because the sewage effluent from this plant will not longer be discharged into the sea. The WWTP "Wschód" will have a positive since the overall removal of pollutants is expected to improve significantly.

Drinking Water Quality

All water supply tasks that concern the building of a new water treatment plant or the modernization of existing ones will have positive impacts.

Rationalization of the Water Supply System

All water supply tasks are aimed at fulfilling this objective and therefore have a positive impact.

Spatial Development of the City

The execution of Gdansk water and wastewater project tasks will allow the city for spatial development by fitting new urban areas with water and sewage systems.

Revitalization of Degraded Downtown and Suburban Areas

It is expected that the building of a new water and sewage system will be a strong stimulus for the revitalization process of some of the districts of the city.

Minimization of Flood Problems

The execution of some of the Project's tasks will reduce the potential negative results of flooding due naturally occurring raising of the Wisla river levels in winter by securing the water supply and reducing the risks of water contamination during floods.

Pressure on Protected Areas Including Natura 2000 Sites

The project will have a positive impact on Natura 2000 sites because of the elimination or better quality of wastewater discharges (tasks 18 and 28) and the elimination of cesspools in the area of task 23.

Transboundary Impacts

A positive impact has been identified for task 28 WWTP "Wschod", because of the better removal of pollutants discharged to the Baltic Sea.

13.8 PREVENTION AND MITIGATION MEASURES

These measures are mainly aimed at avoiding the more sensitive areas or elements, and optimising environmental conditions during both construction and operation phases.

13.8.1 Construction Phase

Impacts from the construction activities will be minimized by implementing the following measures.

Restrictions to the location of construction camps and landfills

Exclusion and restricted areas, where construction camps and landfills shall not be located have been established for this project.

Landmarking definition

The activity area will should be separated from the rest of the terrain with a physical barrier which shall not be trespassed by the machinery nor the construction workers.

Selection process for location of construction camps

Construction camps must be properly designed. The camp will be located outside the exclusion areas and, in choosing the location, it will be taken into consideration that neither water courses nor protected areas are nearby.

Landfill and earth borrowing sites

Since this project involves a considerable generation of earth leftovers, these will be sent to authorized landfills.

Waste management

During construction, an adequate waste management system shall be in place to guarantee a proper waste management.

Air quality protection measures

Measures to be adopted to minimise air emissions during construction phase will include:

- Water spraying of dusty areas,
- All materials that are susceptible of producing dust should be covered during transportation,
- Implementation of a traffic plan,

- Sealing of mixing equipment,
- Minimisation of on-site storage time of construction materials,
- Proper maintenance and operation of all vehicles in compliance with relevant vehicles emission standards,
- All compressors and power generators will comply with air emission standards,
- Filling and covering of the excavated areas as soon as construction is over,
- Fires made at the construction site will only burn wood.

Noise prevention measures

Major abatement measures will include:

- No nighttime construction using heavy machinery will be allowed,
- Noise regulations will be strictly enforced to protect nearby houses, hospitals, schools from annoyance generated by noise and vibration,
- Proper maintenance and operation in compliance with relevant vehicles noise emission standards,
- Compressors and power generators should be of the silent type,

Soil mitigation measures

Cut-and-cover construction techniques would be used where possible to minimize environmental impacts resulting from disruptive surface construction.

Topsoil from the construction areas where excavation or levelling activities will take place, will be dug in a selective way and will be separately stored for a later use in revegetation activities. Topsoil will be piled in heaps at sustainable places in the nearest location from where it was been removed.

Surface water and groundwater protection measures

Measures to be implemented to prevent the entrance of pollutants into the hydrology and hydrogeology systems include: sediment containment barriers, gravity separators, oil and grease separators, sanitary wastewater treatment equipment, impermeable machinery and vehicle maintenance areas, implementation of a spill prevention plan.

Flora protection measures

Measures to protect vegetation include:

- Reduced construction of interim access roads.

- Inventory of the trees in work areas.
- Revegetation measures will be implemented as construction works are finished.
- The vegetation of the areas surrounding the work site will be protected.
- All necessary preventive measures to avoid fires will be implemented.

Fauna protection measures

Measures to protect fauna include:

- Inventory of protected fauna species existing in the area
- Scheduling of fauna disturbing activities to avoid breeding periods
- Installation of temporary elevated cross above the water courses.
- Immediate restoration of any disturbance of the banks or river bed.

Protection of protected natural areas

Natural protected areas will be preserving by applying the following measures:

- Earth borrowing sites, landfills, earth pilling, and camps will be prohibited;
- Natural protected areas will be fenced;
- Interim roads will not be allowed to be constructed within these areas;
- Should a habitat affected by the project, restoration measures will immediately implemented;
- If necessary, compensatory measures will be developed.

Cultural values protection measures

Protection measures to be taken during the construction phase include:

- Protection of those cultural assets that might be affected by marking them off and instructing workers not cause damages them.
- On site archaeologist monitoring construction works as required in the decision for the subtask.

Reclamation of land occupied by construction camps, interim access roads, and other construction installations

Once the construction works will be finished, the land occupied by interim installations associated to the construction works will be cleared, cleaned and returned to its original conditions.

Revegetation measures

Revegetation of the areas that have been devoid of vegetation and should be returned to their original conditions will be revegetated taking into account the original features of the vegetation that was removed. A revegetation project will be prepared.

Landscape Protection Measures

Mitigation measures include the use of green or brownish colours to paint infrastructures, architectural style similar to that of the surrounding area, landscaping.

13.8.2 Operational Phase

Measures against odour nuisances

Projected solutions for sludge management will significantly reduce present odour nuisances. To control level of odour it will be monitored and if necessary Odour Management Plan will be formulated.

Measures against noise and vibration nuisances

Noise will be minimized with mitigation measures such as selection of equipment with low noise and vibration emission levels, self contained installation of the pumping equipments, underground installation of the pumping equipments, or establishing a green belt buffer around the stations.

13.9 ENVIRONMENTAL MONITORING PLAN

The purpose of the Environmental Monitoring Plan is to guide the set up of an Environmental Monitoring Programme to ensure the compliance with the Environmental Impact Assessment (EIA) study recommendations, to assess the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action.

The monitoring plan shall be implemented by the sponsor, this is the Gdansk Water and Wastewater Infrastructure Company, with the help of a contracted Technical Assistance.

13.9.1 Environmental Monitoring During Construction Phase

The contracted Technical Assistant will be responsible for environmental monitoring on construction phase. It is for:

- Establishing a system that ensures the correct execution of all the preventive, corrective and/or compensation measures established in the EIA and the building permit;
- Ensuring archeological supervision during construction works within areas of archeological values;
- Control of the selection of landfills and earth borrowing sites

- Ensuring that construction works will be finished on time
- Ensuring that works are carried out in compliance with safe and health regulations (bhp)
- Accepting building materials, equipment and vehicles used on the construction camps, as well as documents and certificates controlling.

13.9.2 Environmental Monitoring During the Operational Phase

Hydreogeology and water quality

To enable full control over the rationality of water supply management as well as the fulfillment of the EU standards, a system of metering and monitoring water quality will be established for the Gdańsk Water System.

A groundwater quality monitoring system has been implemented since 1997 at the Gdańsk–Wschód WWTP, which has shown that the storage of sewage sludge has no a significant impact on groundwater pollution. The solutions planned within the area of sludge management will further limit the potential hazards for groundwater. This monitoring system will continue to operate in the future.

Air quality and noise levels

Potential air contaminants and noise levels shall be monitored at the limits of the Gdańsk-Wschód WWTP property as well as in the vicinity of the WWTP. Parameters to be monitored will include sulphur dioxide, nitrogen dioxide, carbon oxide, suspended particulate matter as well as odours and noise levels.

Monitoring should be carried out after the WWTP planned modernization. Should the concentrations in the vicinity of the WWTP exceed regulatory thresholds, it will be necessary to establish an area of limited use, according to the provisions of the Environmental Protection Act.

Flora and Vegetation

Monitoring of the evolution of vegetal communities associated to water bodies

Landscape

Monitoring of the evolution of revegetated areasLandscape

13.9.3 Reporting

Reports will be prepared periodically during the construction phase so as to verify and inform on the compliance of the monitoring

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LIST OF FIGURES