KANCELARIA
RADCÓW PRAWNYCH CIC
Pikor, Behnke, Dmoch, Fryzowski Sp. p.

ul. Śląska 50/6, 81-310 Gdynia
Phone: +48 58 620 37 89, +48 58 621 60 89
Fax: +48 58 742 14 07
radcy@kpcic.gdynia.pl, www.kpcic.gdynia.pl

Report on the environmental impact of the project named:

Expansion of the container terminal DCT Gdańsk in Port Północny in Gdańsk

DCT.GDANSK.SA
Deepwater Container Terminal Gdansk

Authors

Tomasz Andrzejewski
Monika Bednarska
Michał Behnke - Team Leader
Szymon Bzoma
Rafał Chmara
Magdalena Kiejzik-Głowińska
Maciej Matczak
Bogdan Ołdakowski
Zbigniew Pawelec
Katarzyna Rachwalska
Wojciech Staszek
Jarosław Szymański
Andrzej Tyszecki
Piotr Zięcik

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This Environmental Impact Report was prepared by a Team appointed by:

Kancelaria Radców Prawnych "CIC"
Pikor, Behnke, Dmoch, Fryzowski Sp. p.
ul. Śląska 50/6, 81-310 Gdynia
phone: 58 620 37 89
phone: 58 621 60 89
fax: 58,742 14 07
radcy@kpcic.gdynia.pl, www.kpcic.gdynia.pl

under the direction of:

legal advisor Michał Behnke

Statement of the Team Leader:

I hereby declare that I meet the requirements referred to in Article 74a paragraph 2 of the Act of October 3, 2008 *on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessments (Dz.U.2016, item 353 as amended), i.e. I graduated, within the meaning of the provisions on higher education, from a single master's degree program and I have more than 5 years of experience in working in teams preparing environmental impact reports and environmental impact forecasts, as well as I took part in the preparation of more than 5 environmental impact reports or environmental impact forecasts.*

I declare that I am aware of the criminal responsibility for making a false statement.

Team Leader's Signature:

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1 Introduction

1.1 Introduction

This report on the environmental impact of the project named: "Expansion of the DCT Gdańsk Container Terminal in Port Północny in Gdańsk" was carried out by a team of experts appointed by the Kancelaria Radców Prawnych „CIC" Pikor, Behnke, Dmoch, Fryzowski Sp.p. in Gdynia, in particular ECG ORBITAL Sp. z o.o. in Gdynia, EKO-KONSULT Sp. z o.o. in Gdańsk and Actia Forum sp. z o.o. in Gdynia, based on a contract between the Legal Office and DCT Gdańsk SA.

The report is an element of the environmental impact assessment of the project, carried out in the case of issuing a decision on environmental conditions. In the circumstances of this case, this Report is an attachment to the application for the aforementioned decision.

The planned project consists of the expansion of the existing Deepwater Container Terminal with a new system - another terminal within DCT Gdańsk SA, referred to in this Report as "T 3". The implementation of the terminal will result in the need to carry out dredging works in the reservoir adjacent to T 3. Due to technological connections, this dredging is considered part of the project, although its investor may be another entity responsible for providing access to the port. Implementation of the project may create the need to perform adaptation works at Terminals T 1 and T 2, functionally related to it.

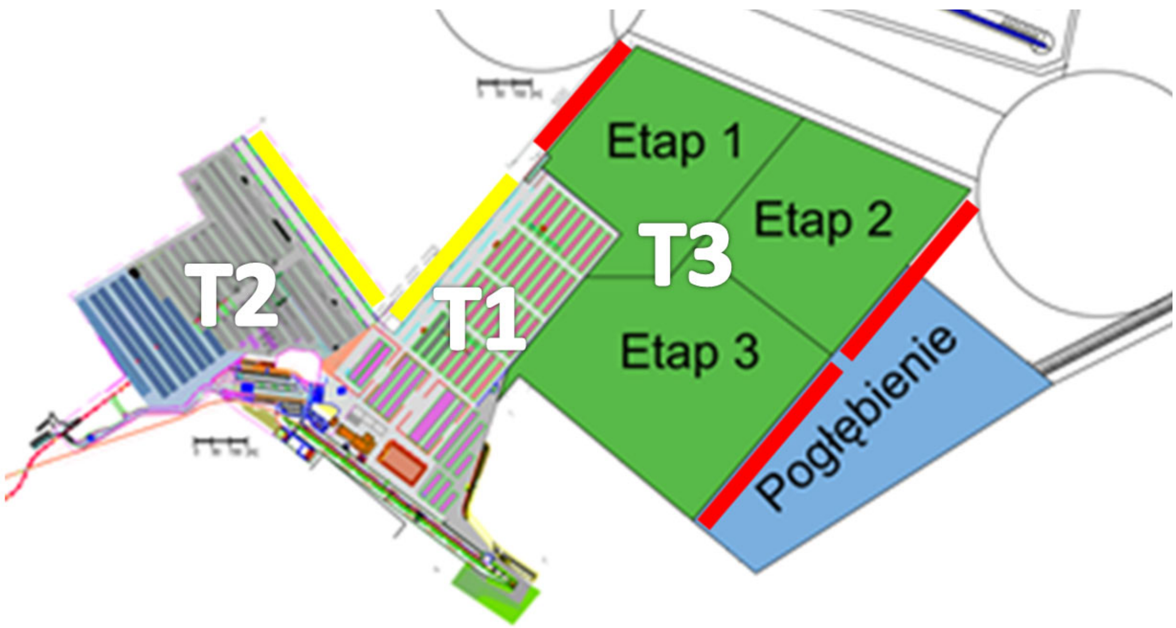

Figure 1: Location of the planned T 3 terminal in relation to the existing T 1 and T 2terminals. Existing and planned new loading quays and storage yards.
In the figure above, the existing loading berths are indicated by the "moored" rectangle next to them in yellow, and the new berths are indicated in red.

The investor of the project is DCT Gdańsk SA, which is the port operator and runs the existing Terminal.

The project involves the construction of a new system within the meaning of the Environmental Protection Law, constituting port infrastructure for loading and unloading, connected to land, located within the Port of Gdańsk. During the operational phase, the use of T 3 will be functionally linked to the remaining existing DCT facility, while maintaining the distinctiveness and integrity of each facility.

The developer is applying for an environmental decision for the purpose of obtaining primarily:

- a water permit for the construction of water facilities - issued under the Act of 20 July 2017. Water Law,
- a decision on the building permit, issued under the Act of 7 July 1994 - Construction Law.

The project aims to increase the capacity and improve the operation of container handling in the Port of Gdańsk. Implementation of the various T 3 phases will allow for a gradual increase in annual handling capacity from the current approximately 3 million TEUs, by 1.3-1.7 million TEUs, in each of the three phases under consideration, resulting in a target increase in this capacity across the facility to approximately 8 million TEUs.

The project is planned to be implemented in the area administered by the Port of Gdańsk Authority S.A. - exclusively in the area of marine waters.

This environmental impact report has been prepared in accordance with the requirements of the Act of 3 October 2008 on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessments.

In accordance with Art. 75 par. 7 of the aforementioned Act, due to the fact that the project will be executed in the maritime area, the competent authority to issue the decision on environmental conditions is the Regional Director for Environmental Protection in Gdańsk.

The procedure for assessing the environmental impact of the planned project shall include, in particular:

a) verification of the project's environmental impact report,
b) obtaining opinions and agreements required by law,
c) providing opportunities for public participation in the proceedings.

1.2 Regulations relevant to the conducted environmental impact assessment. Reference documents.

In preparing this report on the impact of the planned project on the environment, references to the following legal acts were made:

1. Polish regulations:
    - The Act of 3 October 2008 on sharing information about the environment and its protection, public participation in environmental protection and environmental impact assessment (Dz. U. of 2017, item.1405, as amended),
    - Regulation of the Council of Ministers of 9 November 2010 on Projects Likely to have Significant Effects on the Environment (Dz. U. of 2016, item 71),

- And furthermore:
    - The Act of 21 March 1991 on maritime areas of the Republic of Poland and maritime administration (Dz. U. of 2017, item 2205, as amended),
    - The Act of 7 July 1994 Construction Law (Dz. U. of 2017, Item 1332, as amended);

  - The Act of 16 March 1995 on the prevention of marine pollution from ships (Dz. U. of 2017, Item 2000, as amended);
  - The Act of 20 December 1996 on ports and marinas (Dz. U. of 2017, Item 1933, as amended);
  - The Act of 27 April 2001 Environmental Protection Law (Dz. U. of 2018, Item 799, as amended);
  - The Act of 12 September 2002 on port reception facilities for waste and cargo residues from ships (Dz.U. No. 166, item 1361 as amended);
  - The Act of 27 March 2003 on spatial planning and development (Dz. U. of 2017, Item 1073, as amended)
  - The Act of 16 April 2004 on nature conservation (Dz. U. of 2016, Item 2134, as amended);
  - The Act of 13 April 2007 on preventing environmental damage and its repair (Dz. U. of 2018, Item 954, as amended);
  - The Act of 11 June 2011 - Geological and Mining Law (Dz. U. of 2017, Item 2126, as amended);
  - The Act of August 18, 2011 on maritime safety (Dz. U. of 2018, Item 181, as amended);
  - The Act of 14 December 2012 on waste (Dz. U. of 2018, Item 992, as amended);
  - The Act of 19 December 2014 on waste (Dz. U. of 2018, Item 514, as amended);
  - The Act of 20 July 2017 - the Water Act (Dz. U. of 2017, Item 1566, as amended);

- and, of the implementing acts:

  - Regulation of the Minister of Transport and Maritime Economy of 1 June 1998 on the technical conditions to be met by marine hydrotechnical structures and their location (Dz. U. No. 101, Item 645).
  - Regulation of the Minister of the Environment of 16 April 2002 on the types and concentrations of substances that cause the spoil to be contaminated (Dz.U. No. 55, item 498 - repealed);
  - Resolution of the Minister of Economy of 21 December 2005 on essential requirements for devices used outside of facilities in regard to the emission of noise to environment (Dz. U. U. No 263, Item 2202, as amended)
  - Regulation of the Minister of Transport and Construction of 26 January 2006 on the procedure for issuing permits for the disposal of dredging spoil at sea and for dumping waste or other substances at sea (Dz. U. No. 22, Item 166).
  - Regulation of the Minister of Environment of 14 June 2007 on the Permissible Noise Levels in the Environment (Dz. U. of 2014, Item 112).
  - Regulation of the Minister of Environment of 26 January 2010 on reference values for certain substances in the air (Dz. U. No. 16, Item 87);
  - Regulation of the Minister of Environment of 13 April 2010 on the natural habitats and species of interest to the Community, as well as criteria for the selection of areas eligible for recognition or designation as Natura 2000 areas (Dz. U. of 2014, item 1713).
  - Regulation of the Minister of Environment of 12 January 2011 on special bird protection areas (Dz. U. No. 25, Item 133);

- Regulation of the Minister of Health of 8 April 2011 on the monitoring of bathing water quality and the place used for bathing (Dz. U. of 2016, Item 1602),
- Regulation of the Minister of Environment of 20 December 2011 on detailed requirements for geological works designs, including works that require obtaining concessions (Dz. U. No. 288, Item 1696);
- Regulation of the Minister of Transport, Construction and Maritime Economy of 29 May 2012 on defining the seaport boundary in Gdańsk from the sea, roadstead and land side (Dz. U. of 2012, Item 650),
- Regulation of the Minister of Environment of 24 August 2012 on the levels of certain substances in the air (Dz. U. of 2012, Item 1031),
- Regulation of the Minister of Environment of 30 November 2014 on the requirements for emission measurements and measurements of absorbed water (Dz. U. of 2014, Item 1542),
- Regulation of the Minister of Environment of 18 November 2014 on the conditions which must be fulfilled when introducing sewage into water or soil, and on substances particularly harmful for water environment (Dz. U. of 2014, Item 1800),
- Regulation of the Minister of the Environment of 9 October 2014 on protection of plant species (Dz. U. U. of 2014, item 1409).
- Regulation of the Minister of the Environment of 9 December 2014 on the waste catalogue (Dz. U. of 2014, Item 1923),
- Regulation of the Minister of Infrastructure and Development of 9 December 2014 on detailed conditions for safe navigation by seagoing vessels (Dz. U. of 2015, Item 48),
- Regulation of the Minister of Infrastructure and Development of 7 May 2015 on the definition of port areas and publicly accessible facilities, equipment and installations included in the port infrastructure for each port of fundamental importance for the national economy (Dz. U. of 2013, Item 732),
- Regulation of the Minister of Infrastructure and Development of 7 May 2015 on the definition of facilities, equipment and installations included in the infrastructure providing access to a port of fundamental importance for the national economy (Dz. U. of 2015, Item 733),
- Regulation of the Minister of the Environment of 23 September 2016 on the conditions under which waste is considered to be non-hazardous (Dz. U. of 2016, Item 1601),
- Regulation of the Council of Ministers of 18 October 2016 on the adoption of the Flood Risk Management Plan for the Vistula River Basin Area (Dz. U. of 2016, Item 1841),
- Regulation of the Council of Ministers of 18 October 2016 on the Water Management Plan for the Vistula River Basin (Dz. U. of 2016, Item 1911),
- Regulation of the Minister of Environment of 18 November 2016 on Hydrogeological Documentation and Geoengineering Documentation (Dz. U. of 2016, Item 2033),
- Regulation of the Minister of the Environment of 16 December 2016 on protection of animal species (Dz. U. of 2016, Item 2183),
- Regulation of the Council of Ministers of 8 August 2017 on the manner of organization of combating threats and pollution at sea (Dz.U. 2017, item 1631);

- Regulation of the Council of Ministers of 11 December 2017 on the adoption of the National Programme for the Protection of Marine Waters (Dz. U. of 2017, Item 2469),

2. EU regulations, mainly including:
    - directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment,
    - directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds,
    - Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as amended),

- And furthermore
    - council Directive 95/21/EC of 19 June 1995 concerning the enforcement, in respect of shipping using Community ports and sailing in the waters under the jurisdiction of the Member States, of international standards for ship safety, pollution prevention and shipboard living and working conditions (port State control);
    - directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (the Water Framework Directive);
    - directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage;
    - directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive);

3. International conventions, mainly including:
    - Convention for the prevention of marine pollution by dumping of wastes and other substances of 29 December 1972 (Dumping Convention);
    - International Convention for the Prevention of Pollution from Ships, November 2, 1973 (MARPOL Convention);
    - Convention on the Conservation of Migratory Species of Wild Animals of June 23, 1979 (Bonn Convention);
    - Convention on the Conservation of European Wildlife and Natural Habitats of September 19, 1979 (Bern Convention);
    - Convention on the Law of the Sea of 10 December 1982 (Jamaica Convention);
    - Convention on Biological Diversity 1992 and the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (CBD);
    - Agreement on the Conservation of Small Cetaceans of the Baltic, Northeast Atlantic, Irish and North Sea of 17 March 1992 (ASCOBANS);
    - Convention on the Protection of the Marine Environment of the Baltic Sea Area of April 9, 1992 (Helsinki Convention);

4. HELCOM recommendations, primarily including:
    - Recommendation 15/1 (2018) - on the protection of the coastal belt
    - Recommendation 35/1 (2014) - on the system of coastal and marine protected areas (Helcom MPAs)
    - Recommendation 31E/6 (2010) - on integrated emergency response planning in the Baltic Sea area for wildlife;
    - Recommendation 28E/9 (2007) - on the development of general principles for maritime spatial planning in the Baltic Sea area;
    - Recommendation 24/9 (2003) on ensuring adequate (rescue) response capacity
    - Recommendation 21/4 (2000) - on the conservation of endangered marine and coastal Baltic biotopes;
    - Recommendation 20/4 (1999) - on antifouling paints containing organotin compounds
    - Recommendation 19/17 (1998) - on measures to combat pollution from offshore systems;
    - Recommendation 19/1 (1998) - on the extraction of sediments from the seabed;
    - Recommendation 17/3 (1996) - on information and consultation in the process of constructing new installations affecting the Baltic Sea;

The report was based on the following studies:

- Concept. Extension of the DCT Marine Container Terminal in Gdańsk, DCT Gdańsk SA, August 2013,
- Materials and information DCT Gdańsk SA,
- Report on the environmental impact of an investment project, prepared in the course of proceedings for the issuance of a building permit for the Marine Container Terminal located at Port Północny in Gdańsk, Projmors - NORD Investments SA - WUPROHYD, October 2004,
- Construction design of the Maritime Container Terminal in Gdańsk. Volume No. 08.
- Report on environmental impact of dredging works and disposal works for dredged sediment, Projmors - NORD Investments SA - WUPROHYD, 2004,
- Geotechnical Documentation for the Marine Container Terminal in Gdańsk, Polish Geological Institute, 2004,
- Natural inventory of the area of the planned extension of the Deepwater Container Terminal in Gdańsk, UG, Gdańsk, 2012/2013,
- Inventory map for informational purposes,
- Assessment of the State of the Ground and Water Environment in the area of the proposed construction of the container terminal in the city of Gdańsk (July, August 2013),
- Decision of the Regional Director for Environmental Protection in Gdańsk of September 20, 2013 declaring the discontinuance of proceedings for issuing a permit for the destruction of habitats and specimens of the sea buckthorn Hippophae

rhamnoides growing on record plot no. 75/2 and 104, precinct 86, on Stogi Island in Gdańsk, Pomorskie Voivodeship, sign: RDOŚ-Gd-PNII.6400.44.2013.MŚ.1.

- Decision of the President of the City of Gdańsk, WŚ-I.6220.II.93D.2013.AN.173164, dated 16.07.2014 on environmental conditions for the undertaking named "Construction of the Pomeranian Logistics Centre (PCL) - II stage together with land development and technical infrastructure at ul. Kontenerowa in Gdańsk, Stogi district";
- Decision of the Regional Director of Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4221.8.2015.ER.AJA.9, dated 09.10.2015 on environmental conditions, stating that there is no need to carry out an environmental impact assessment for the project named "Expansion of the Polnocne Quay at the Peninsular Breakwater";
- Decision of the Regional Director for Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4221.2.2013.ER.27, dated 14.06.2016 on the environmental conditions for the project named "Extension of the approach fairway with increasing its width and technical depth together with the construction of a turning basin with a diameter of 750 m", within the modernization of the approach fairway to Port Północny, located in the marine waters of the Gulf of Gdańsk and within the limits of the seaport in Gdańsk;
- Decision of the Regional Director of Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4221.30.2014.KSZ.18, dated 05.09.2016, on environmental conditions for the project named "Protective breakwaters in Port Północny in Gdańsk";
- Decision of the Regional Director for Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4221.13.2015.AJA.11, dated 28.01.2016 on environmental conditions, stating that there is no need to carry out an environmental impact assessment for the undertaking entitled "Reconstruction of the Northern Island Breakwater in Port Północny in Gdańsk";
- Decision of the Regional Director for Environmental Protection in Gdańsk RDOŚ-Gd-WOO.4211.29.2013.AT.9 dated 28.03.2014 on environmental conditions for the project consisting in construction of terminal T2.
- Project Documentation: "Extension of the approach fairway with increase of its width and technical depth together with construction of a turning basin with a diameter of 750 m" (EIA Report, Transprojekt Gdański, 2015) and the environmental decision concerning it (decision of RDOŚ in Gdańsk marked RDOŚ-Gd-WOO.4211.2.2013.ER.27 dated 14.06.2016);
- Project Documentation: "Protective breakwaters in Port Północny in Gdańsk" (EIA Report, ECG Orbital, 2015) and the environmental decision concerning it (Decision of RDOŚ in Gdańsk marked RDOŚ-Gd-WOO.4211.30.2014.KSZ.18 dated 05.09.2016), including "Final report on the implementation of ornithological monitoring in the area of Port Północny in Gdańsk." Task period: November 2015 - October 2016 (Maritime Office in Gdynia) (Orbital, 2016);
- Construction design of the approach fairway to Port Północny together with the analyses within the scope of the task Port Północny - Modernization of the approach fairway and island breakwater, aut. Wuprohyd, November 2009.

The report was performed using program and planning documents at the national, regional and local levels.

1.3 Qualification of the project

The project consisting in the construction of the T3 terminal within the DCT Container Terminal is planned to be implemented in the area administered by the Port of Gdańsk Authority S.A., exclusively in the maritime area - within the internal maritime waters of Port Północny in Gdańsk, as specified in the Regulation of the Minister of Transport, Construction and Maritime Economy of 29 May 2012 on defining the boundary of the seaport in Gdańsk from the sea, roadstead and land.

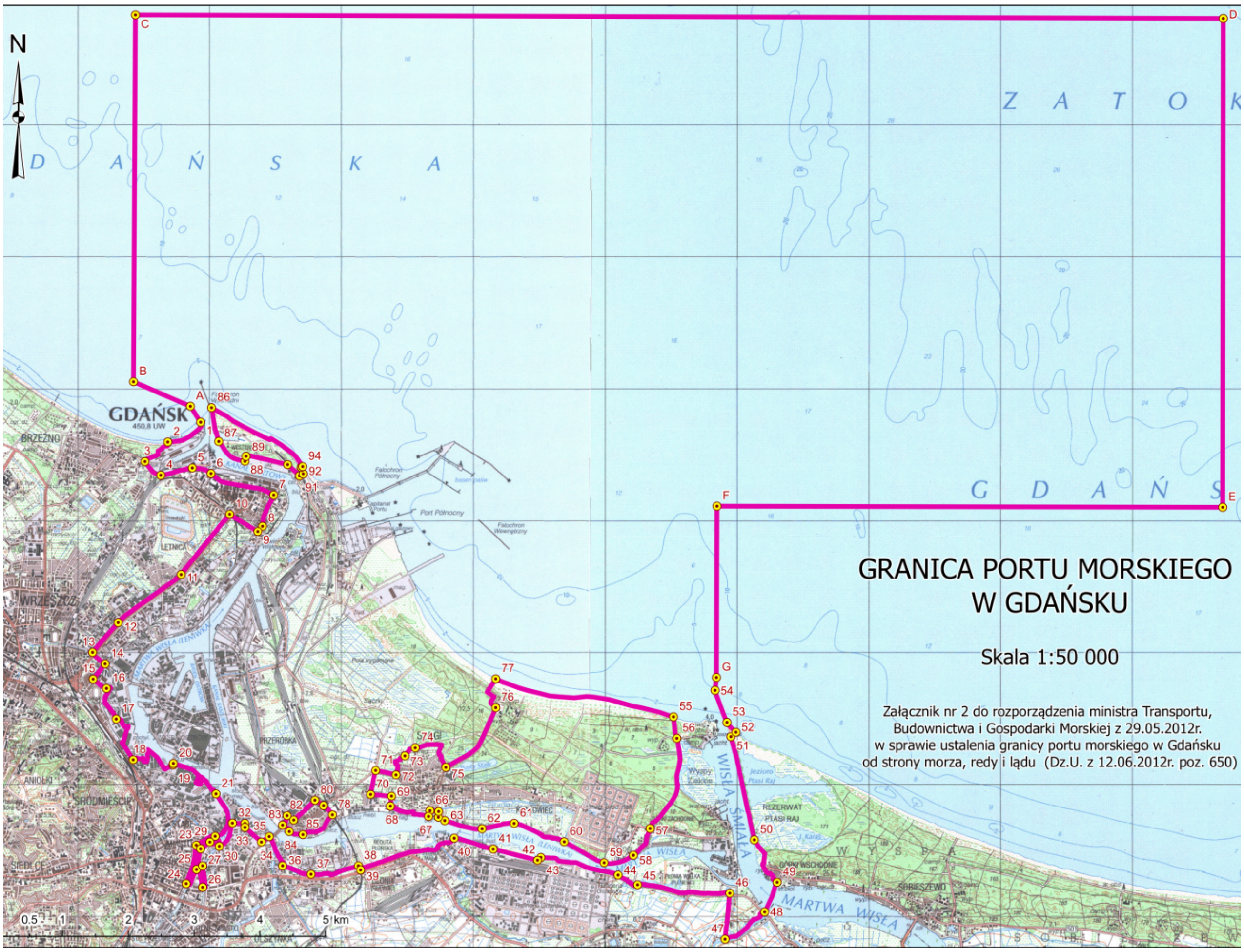

Figure 2 Map enclosed in Appendix No. 2 to the Regulation of the Minister of Transport, Construction and Maritime Economy of 29 May 2012 on determining the boundaries of the seaport in Gdańsk from the sea, roadstead and land (Dz.U. 2012.650)
[source www.umgdy.gov.pl]

The classification of the T3 project is influenced by its location in the maritime area - within the internal sea waters of Port Północny in Gdańsk (and the construction backup facilities - in the area administered by the Port of Gdańsk Authority S.A. - located within the city of Gdańsk, currently at the disposal of DCT S.A.). The classification criterion is also the ability to handle vessels with a carrying capacity of more than 1 350 t, within the meaning of the Act of 18 September 2001. - Maritime Code. In the decision on environmental conditions for terminal T 2, built in 2014-2016, which shaped the current handling capacity at DCT Gdańsk SA, regarding the classification of the project, it is stated:

"According to § 2 (1) (34) of the Regulation of the Council of Ministers of November 9, 2010 on projects that may significantly affect the environment, the above project, classified as: *'ports or marinas, within the meaning of the Act of 20 December 1996 on ports and marinas (Dz. U. of 2010 No. 33, item 179), including port infrastructure for loading and unloading, connected to land or located beyond the coastline, for the handling of vessels with a carrying capacity of more than 1 350 t, within the meaning of the Act of 18 September 2001. - Maritime Code (Dz. U. of 2009 No. 217, item 1689 and of 2010 No. 127, item 857) and the Act of 21 December 2000 on inland navigation, with the exception of marinas for ferries"* has the status of a "project which may always have a significant impact on the environment", for which it is required to obtain a decision on environmental conditions and carry out a mandatory environmental impact assessment.

The provisions of the above regulation implement within the scope of their regulation the Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment. According to point 8(b) of Annex I of the Directive, the project is classified as: *"commercial ports, quays for loading and unloading connected to land and outer harbour (excluding ferry piers) which can take vessels of over 1 350 tonnes"* and is subject to the requirements of Article 4(1) of the Directive and therefore to the requirement for an environmental impact assessment as laid down in Articles 5 to 10 of the Directive.

The relationship of the project with port infrastructure and its status are further clarified for the purposes of determining its qualification in the letter of the Port of Gdańsk Authority DN/034/74/70/2012 dated October 18, 2012."

The explanations provided in the letter from ZMPG Gdańsk, dated October 18, 2012 to RDOS in Gdańsk **(Annex 1-1)** remain valid.

The key element of importance for the classification of the current project according to the provisions of the Regulation of the Council of Ministers of 9 November 2010 on projects likely to have a significant impact on the environment is its technical connection with the existing terminal and the ability to handle vessels with a carrying capacity of more than 1 350 t at the new berths. A link of this nature means that the planned T3 terminal can be treated as an extension of the existing DCT terminal.

According to § 2 sec. 2 item 1 of the above mentioned regulation "Projects which may always have a significant impact on the environment include also projects consisting in extension, reconstruction or assembly of projects implemented or completed listed in sec. 1 *(here: § 2(1)(34*)), if that expansion, reconstruction, or installation achieves the thresholds specified in paragraph *(*1), if those thresholds are specified *(here: the ability to handle vessels with a carrying capacity greater than 1,350 tons*)."

The above provision is a manifestation of the implementation of point 13(a) of Annex II to the above mentioned Directive 2011/92/EU, according to which the projects referred to in Article 4(2) of the Directive are also: "Any alteration or extension of projects listed in Annex I or this Annex, already approved, completed or under construction, which may cause significant adverse environmental effects (alterations or extensions not listed in Annex I)."

According to public press releases and information provided by DCT Gdańsk S.A., DCT terminal handles and will handle vessels such as: OOCL "Hong Kong", Triple-E Maersk "Mc-Kinney Moeller", COSCO Shipping Lines "Arctic Ocean", MSC "Maya", mv Maersk Eubank, mv Eleonora Maersk, mv

Edith Maersk, mv Maersk Edmonton, mv Ebba Maersk, mv Elly Maersk, mv Emma Maersk, mv Eugen Maersk, mv Maersk Erving, mv Maersk Effingham, mv Evelyn Maersk, mv Maersk Eubank, mv Estelle Maersk. From the available information, it is clear that these vessels exceed the carrying capacity threshold specified in § 2, section 1, item 34 of the Regulation of the Council of Ministers of November 9, 2010 on projects that may significantly affect the environment ["vessels with a carrying capacity of more than 1,350 t"]. For example:

- **OOCL "Hong Kong":**

OOCL HONG KONG Master Data			
Built:	2017	Gross Tonnage:	210890 t
Size:	400 x 59 m	Net Tonnage:	63279 t
Draught:	32.5 m	Deadweight:	191422 t

Source: OOCL HONG KONG - Container Ship - Details and current position IMO 9776171 MMSI 477333500 | Vessels | VesselFinder
https://www.vesselfinder.com/vessels/OOCL-HONG-KONG-IMO-9776171-MMSI-477333500

- **Triple-E Maersk "Mc-Kinney Moeller":**

MAERSK MC-KINNEY MOLLER Master Data			
Built:	2013	Gross Tonnage:	194849 t
Size:	399 x 59 m	Net Tonnage:	79120 t
Draught:	30.3 m	Deadweight:	194153 t

Source: MAERSK MC-KINNEY MOLLER - Container Ship - Details and current position IMO 9619907 MMSI 219018271 | Vessels | VesselFinder
https://www.vesselfinder.com/vessels/MAERSKMCKINNEYMOLLER-IMO-9619907-MMSI-219018271

Triple-E Maersk "Mc-Kinney Moeller," according to Portal Morski:

- bearing capacity: 194,153 t
- empty vessel mass: 52,859 t
- displacement (approx): 250,000 t

Source : http://www.portalmorski.pl/stocznie-statki/23694-maersk-mc-kinney-moller-zawinie-21-sierpnia-2013-do-terminalu-dct-gdansk

The above vessels are examples, in the future DCT will be able to handle the newest vessels of MGX-23 and MGX-24 series from MSC and CMA-CGM.

Consequently, **the basis for classifying the project "Extension of the DCT Gdańsk Container Terminal in Port Północny in Gdańsk" as an undertaking obliged to obtain a decision on environmental conditions is § 2 section 2 point 1 in connection with § 2 section 1 point 34 of the Regulation of the Council of Ministers of 9 November 2010 on undertakings which may have a significant impact on the environment. The above classification, in the category of "projects likely to always significantly affect the environment" - "group I" - entails the obligation to conduct an environmental impact assessment.**

The planned project consists of the construction of Terminal T 3 - extension of the Deepwater Container Terminal DCT. Functionally related to this project will be the adaptation works induced by the extension. The project involves the construction of a new system within the meaning of the Environmental Protection Law, constituting port infrastructure for loading and unloading, connected to land, located within the Port of Gdańsk. During the operation phase, the use of the extended part of the DCT terminal will be functionally linked to the existing facilities - Terminals 1 and 2, while maintaining the integrity and technological and organizational autonomy of each of these facilities. The environmental assessment carried out in this Report therefore does not treat the extension of the DCT as an extension of the system but as an extension of a facility, within the meaning of the Environmental Protection Law, operated by a port operator, i.e. DCT Gdańsk SA, and includes both the existing terminals and the planned project in the assessment of cumulative and synergic impacts.

1.4 Method of development

1.4.1 General remarks

The environmental impact report was drawn up in accordance with the requirements of Article 66 of the Act of 3 October 2008 on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessments.

The environmental impact assessment of the planned project was based on archival materials, industry studies, literature on the subject and the authors' experience.

Specifically, the evaluation used, due to the carrying capacity of the data and conclusions contained therein:

- documentation of the existing DCT Container Terminal in Gdańsk,
- documentation of projects planned for implementation in the immediate vicinity of DCT:
  - "Extension of the approach fairway with the increase of its width and technical depth together with the construction of a turning basin with a diameter of 750 m":
    - Environmental Impact Report, Transprojekt Gdańsk, 2015 [Transprojekt 2015. Report on the environmental impact of the project entitled "Extension of the approach fairway with increasing its width and technical depth together with the construction of a turning basin with a diameter of 750m, as part of the modernization of the approach fairway to Port Północny in Gdańsk." Transprojekt Gdański Sp. z o.o., Gdańsk 2015]
    - decision on environmental conditions (decision of Regional Director of Environmental Protection in Gdańsk, ref. RDOŚ-Gd-WOO.4211.2.2013.ER.27 dated 14.06.2016);
  - "Protective breakwaters in Port Północny in Gdańsk":
    - environmental Impact Report, ECG Orbital, 2015 [Orbital 2015. Report on the environmental impact of the project entitled. "Protective breakwaters in Port Północny in Gdańsk" Gdynia. September, 2015]
    - decision on environmental conditions (decision of Regional Director of Environmental Protection in Gdańsk, ref. RDOŚ-Gd-WOO.4211.30.2014.KSZ.18 dated 05.09.2016);
- the most up-to-date and comprehensive documentation from the implementation of ornithological monitoring regarding the final area of the project and neighbouring areas:
  - report on ornithological monitoring in the area of Port Północny in Gdańsk [[Orbital 2016. "Final report on the implementation of ornithological monitoring in the area of Port Północny in Gdańsk." Task period: November 2015 - October 2016 (Maritime Office in Gdynia)]

Based on the analysis of the available survey and inventory results, the Author Team concluded that the available source materials contain sufficient information about the natural environment in the area planned for the project and in the area of its potential impact. Therefore, the need for separate, comprehensive wildlife surveys and inventories was precluded. The analysis in this regard is attached as **Appendix 1-2** to the Report.

When assessing the rationale for locating the planned project in the Port of Gdańsk, the findings of the existing strategic and planning documents at the national, regional and local level were analysed. The compatibility of the planned project with national and regional policies was also verified.

The starting point for the work on the Report was the determination of the current state of the environment, identification of the forms of nature and landscape protection and cultural heritage sites in the project area and in the area of its potential impact, as well as analysis of available documentation in this respect. Based on the aforementioned documentation, the extent of the anticipated environmental impact was determined.

For the purposes of the Report, the analysis included:

- the advisability of the project,
- economic, spatial, environmental and social conditions of the planned project,
- project variance criteria,
- the magnitude and significance of potential environmental impacts during the implementation and operation phases and during the decommissioning phase,
- possibilities of limiting the adverse impacts of the project on the environment.

In addition, the environmental impact assessment of the planned project was used:

- available data on the condition of the environment and threats in the area of the planned project, archival materials, professional studies,
- thematic and topographic maps,
- information on Natura 2000 sites from the website of the General Directorate for Environmental Protection; Standard Data Forms and maps showing the spatial extent of Natura 2000 sites at www.geoportal.gov.pl; and available literature,
- results of visual inspections and field work performed specifically for the Report,

In assessing the environmental impacts of the planned project, particular attention was paid to:

- threats to nature, including within the Natura 2000 area,
- recommendations for implementation and operation of the Container Terminal as the primary means of mitigating potential negative environmental impacts,
- opportunities to mitigate adverse impacts.

1.4.2 Natural Issues Methodology

1.4.2.1 Description of the invertebrate/macrozoobenthos survey method

The results of the inventory conducted by Transprojekt Gdański Sp. z o.o. for the Maritime Office in Gdynia (Transprojekt 2015) were used for macrozoobenthos analyses. The nearest survey points were located approximately 700 meters from the proposed project (sites 1-14) (figure below).

The study was conducted three times during the year, covering the periods:

- spring – April;
- summer – July;
- autumn – October.

In addition, results collected for the preparation of documentation for the construction of breakwaters were used to characterize the macrozoobenthos. In September 2014, macrozoobenthos samples were collected at 15 sites (sites 15-29) (figure and table below) located in the area of the planned work (Volovich 2014).

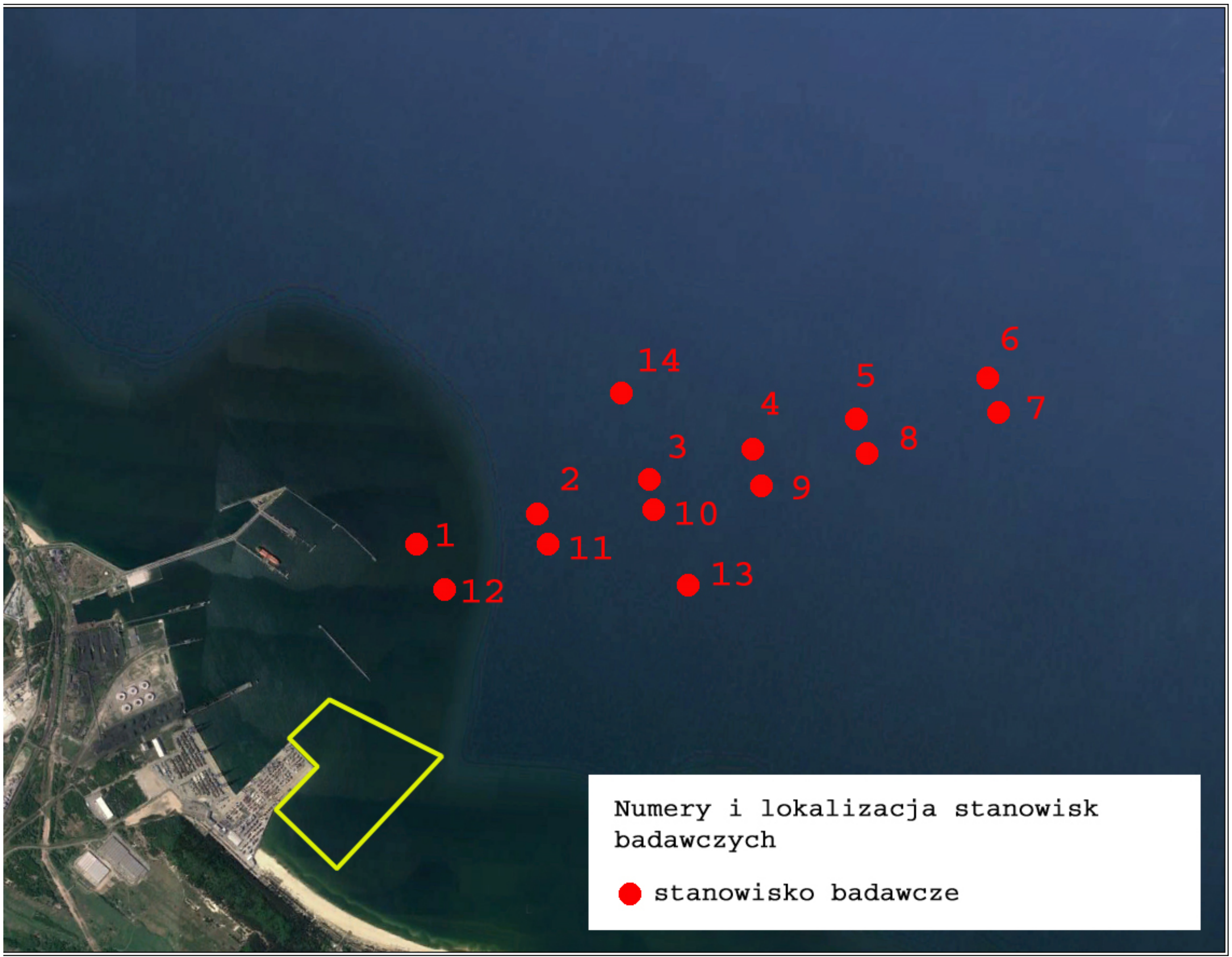

Figure 3 Location of macrozoobenthos test sites (sites 1-14)
(source: Transprojekt Gdański Sp. z o.o.)

Figure 4 Location of macrozoobenthos test sites (sites 15-29)
(source: Wołowicz 2014)

Table 1 Geographic coordinates of study material collection sites

Site No	Geographical position
15	54°23'28,9"N, 18°43'50,4"E
16	54°23'20,7"N, 18°44'12,7"E
17	54°23'14,0"N, 18°44'41,1"E
18	54°23'24,9"N, 18°44'50,0"E
19	54°23'35,1"N, 18°44'51,7"E
20	54°23'45,8"N, 18°44'57,2"E
21	54°23'58,8"N, 18°45'02,9"E
22	54°23'38,6"N, 18°44'03,3"E
23	54°23'33,2"N, 18°44'23,3"E
24	54°23'42,3"N, 18°44'26,8"E
25	54°23'12,1"N, 18°43'55,1"E
26	54°23'00,6"N, 18°44'39,2"E
27	54°23'23,4"N, 18°45'08,2"E
28	54°23'33,9"N, 18°45'23,6"E
29	54°23'50,9"N, 18°45'20,4"E
24	54°23'42,3"N, 18°44'26,8"E
25	54°23'12,1"N, 18°43'55,1"E
26	54°23'00,6"N, 18°44'39,2"E
27	54°23'03,4"N, 18°45'08,2"E
28	54°23'33,9"N, 18°45'23,6"E
29	54°23'50,9"N, 18°45'20,4"E

The macrozoobenthos collection procedure followed the methodology outlined in the Manual for Marine Monitoring in the COMBINE Program of HELCOM, Annex C-8 soft bottom macrozoobenthos.

The bottom was sampled with a van Veen type bucket with a grip area of 0.1 m2 and a weight of 25 kg. After transfer to the washer, the collected material was sieved through a sieve with a mesh length of 0.5 or 1 mm. Immediately after collection, samples were preserved with 4% buffered formaldehyde solution. The obtained results were converted to m^2 of bottom area.

Dominance and constancy indices were calculated to determine the structure of the benthic macrofauna in the area of the planned project. The dominance index D indicates the role the species plays in the environment. Dominance classes were defined according to Trojan's (1980) scale: dominants (>5), subdominants (2-5), influents (1-2), accessory species and alien species "1). The stability index C (Szujecki 1980, Czachorowski 2006) determines the frequency of occurrence (frequency) of a species on the sites and informs about its commonness or rarity in the studied area. The type of constancy of a given taxon in a biocenosis was determined using the Tischler (1971) scale: 100 - 76 absolutely fixed taxon, 75 - 51 fixed taxon, 50 - 26 accessory taxon, 25 - 0 incidental taxon.

1.4.2.2 Description of ichthyofauna survey method

Surveys and catches were conducted in 2014, on an annual basis in three periods: spring-summer (2-4.06, 27-29.06), summer (18-20.07, 27-29.08), and autumn (15-17.09, 12-14.10), each with two repetitions of catch using multi-panel pond net sets with 10×50 mm mesh sides. The duration of one fishing cycle was 2 days, assuming that the caught fish were picked from the gear daily. (Transprojekt, 2015)

The transects in Area 1 and Area 2 have been designated accordingly due to the investment of the approach fairway to Port Północny, but at the same time it means that they are located at a distance of 1-3 km from the area of the planned T3 investment.

The figure below shows the distribution of fishing transects by survey period. Pre-planned transects are also marked on it but there are some differences in the location of the actual transects due to the close proximity of the fairway and heavy vessel traffic, hydrometeorological conditions and the presence of fishing nets.

The display time for a single set was a minimum of 12 hours. Because it was not technically feasible to release and select all sets at the same time, the actual time that tools were in the water varied from one fishing location to another. The yield (number and weight of fish caught in each test set) was converted into an hour of catch. Such standardization ensures that the results obtained can be compared with observations at other net exposure sites and study periods.

The following nets were used for non-selective fishing:

- pelagic set - two multi-panel nets, 190 m each (set length - 380 m);
- bottom set - two multi-panel nets, 190 m long each (the length of the set - 380 m).

A standard net permitted by European Union and national regulations, with an 80 mm mesh, was used to catch migratory fish (salmonids). A 2/3 orchard factor was used. The length of the network was 400 m.

The procedure for handling the catch included:

- sorting fish into individual species;
- determination of the catch weight of each fish species (in the case of fishing with bottom research nets, determination of the catch weight from each type of net separately);
- total length *(longitudo totalis* - l.t.) measurements of each fish species;
- ichthyological analyses of fish species dominating the fishery targeted by the fishery.

The ichthyological analysis procedure included:

- measuring length and weight of individuals;
- determination of sex and stage of sexual maturity (gonadal development) according to the nine-grade modified Maier scale;
- otolith collection to determine the age of a given fish.

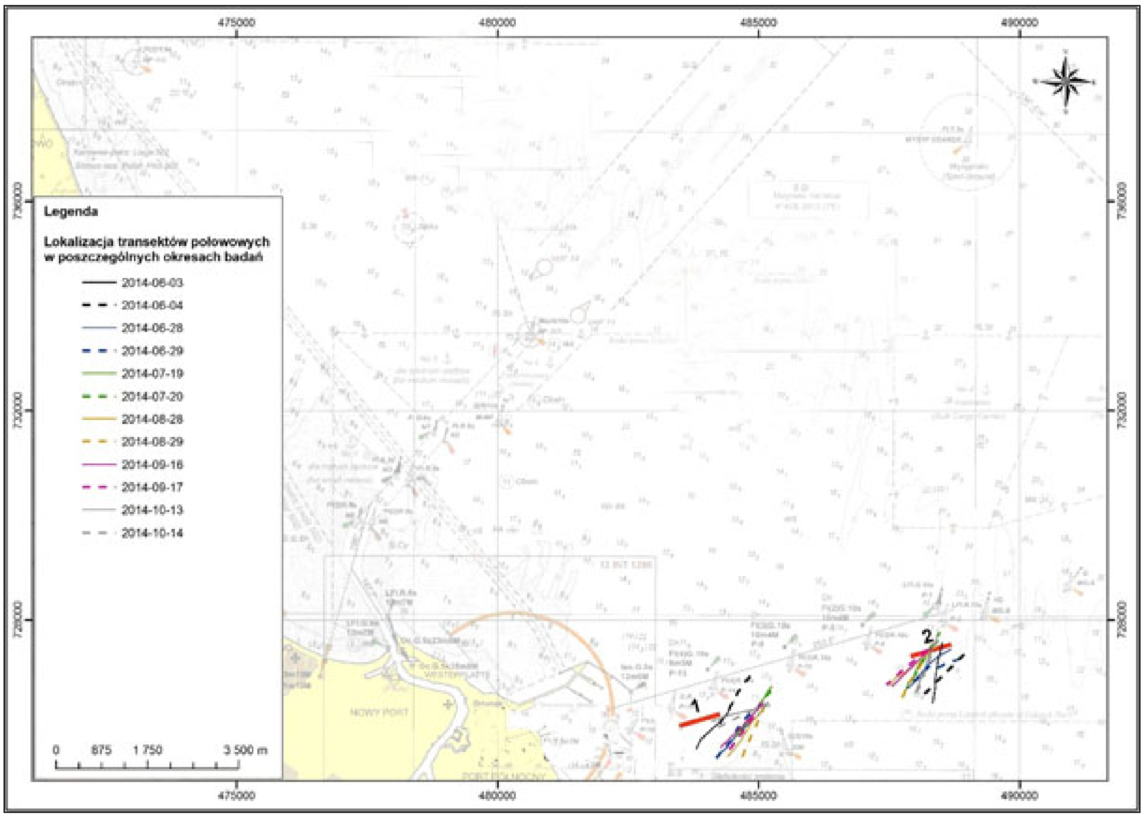

Figure 5 Distribution of fishing transects by survey period
(Source: based on Transprojekt Gdański 2015)

The survey tools provided for the implementation of the inventory do not provide the ability to both determine, let alone reflect, the abundance of lampreys present in the basin. An inventory that also includes lampreys should assume the use of trapping tools, but this would be impossible or very difficult due to the bathymetric and hydrologic characteristics of the area. Certainly, staging such gear in the immediate vicinity of the approach fairway to the port would also be fraught with considerable risk.

Therefore, the occurrence of lampreys was developed only from available literature. The study of ichthyofauna occurring in the coastal zone was done similarly.

1.4.2.3 Description of the avifauna survey method

Ornithological surveys were conducted in Port Północny area and adjacent water bodies (figure below) for the Maritime Authority between November 2015 and October 2016 (Orbital 2016). Surveys were also conducted on behalf of the DCT in the beach area east of T 1. Research conducted directly in the area of the planned investment (Orbital 2016), which includes a fragment of the water body of the Gulf of Gdańsk, was fundamental for the conclusion of the impact of the planned investment on birds. It was, along with its surroundings, subjected to regular observations throughout the year. The entire monitored area was divided into smaller, separable water bodies where all wetland bird species were monitored.

Figure 6 Ornithological survey area by water body
(on the basis of: Final report on the implementation of ornithological monitoring in the area of Port Północny in Gdańsk. Orbital 2016). The red line marks the investment area.

All wetland birds associated with the monitoring area were recorded during the surveys. Birds sitting on the water as well as using the harbour infrastructure to rest were counted. Species flying over the study area (geese, cranes) were not recorded. Research was conducted using binoculars and a telescope. Larger flocks of birds (coots, cormorants) were photographed and then counted on a monitor screen. The area was inspected in a regime of three inspections per month between November 2015 and October 2016. A total of 36 inspections of the entire area were performed.

Avifauna of the beach area adjacent to the DCT Terminal

The avifauna of the beach adjacent to the DCT Terminal (at a length of about 460 m) together with the adjacent water body was studied in detail in connection with the decision RDOŚ-Gd-WOO.4211.29.2013.AT.9 dated 28 March 2014. Surveys at this site are being conducted as part of ornithological surveillance reports of the effectiveness of mitigation activities associated with the construction of the T2 Terminal.

Inspections of nesting birds on the beach, which are the subject of the ongoing mitigation measures described in the environmental decision for T2, were performed frequently enough to obtain a complete picture of their breeding. To the greatest extent, this concerned the common ringed plover, nesting from the first year on the beaches in the area of mitigation activities. Between April and August, at least four inspections per month were performed in each month.

1.4.2.4 Description of the teriofauna survey method

The characterization of marine teriofauna was based mainly on available literature and research sources. The results of the research on harbour porpoises in the Baltic Sea carried out within the international project SAMBAH[1] , which consisted in stationary underwater recording of sounds made by porpoises (about 300 detectors recorded sounds of porpoises for 2 years), provided data on the place and time of their occurrence, as well as on their population size[2]. The purpose of the SAMBAH project was to provide data on a Baltic-wide scale that would provide a basis for determining where and when to conduct detailed surveys in national waters for the designation of new NATURA2000 sites[3].

1.4.2.5 Description of the method of surveying vegetation on the land base

The planned investment will be carried out only in the area of the sea basin. In the immediate vicinity are land areas completely occupied by existing wharves and port areas of the existing DCT. These are areas entirely covered with artificial surfaces, buildings and equipment used for handling and transportation, completely devoid of vegetation. Therefore, no detailed study of the terrestrial flora and vegetation was conducted. Only a general review of vegetation community types was conducted as part of this report, and was limited to the site further inland - more than 300 m south of the eastern portion of the proposed T3 terminal. This area is a strip of beach and dune shoreline, covered at the same time by the implementation of mitigation measures as part of the environmental decision regarding the existing DCT expansion (Decision No. RDOŚ-Gd-WOO-4211.29.2013.AT.9).

Vegetation characterization utilized the results of inventory surveys conducted in 2012 and 2013 for the T 2 Terminal Expansion Environmental Impact Report and data collected during the natural

[1] Static acoustic monitoring of the Baltic Sea harbour porpoises
[2] LIFE+ SAMBAH project 2016 - www.sambah.org; Assessment of the conservation status of harbour porpoise..
[3] Pawliczka 2013

mitigation area typing for the aforementioned study. Additionally, a field reconnaissance of habitat types and plant communities was performed in May 2018. Inventory/evaluation of vegetation and natural habitats was conducted using the method of marshalling and systematic floristic inventory (Faliński 1990) in the entire study area. Field work was performed on May 23, 2018.

The nomenclature of recognized plant species was adopted from Mirek et al. (2002). Nomenclature of plant communities was adopted after Matuszkiewicz (2008). The Regulation of the Minister of Environment on natural habitats and species of Community interest and the criteria for selecting the areas eligible for recognition or designation as Natura 2000 sites was also taken into account.

1.4.3 Methodology of air pollution calculations

To analyse dispersion of pollutants in the air, the **OPERAT FB** calculation program was used, in compliance with reference methodologies for modeling substances in the air, included in the Regulation of the Minister of the Environment of 26 January 2010 **on reference values for certain substances in the air** *(Dz.U. No. 16, item 87)*.

For calculations data from meteorological station Gdańsk-Wrzeszcz, which in a representative way reflects meteorological conditions for analysed area, was taken.

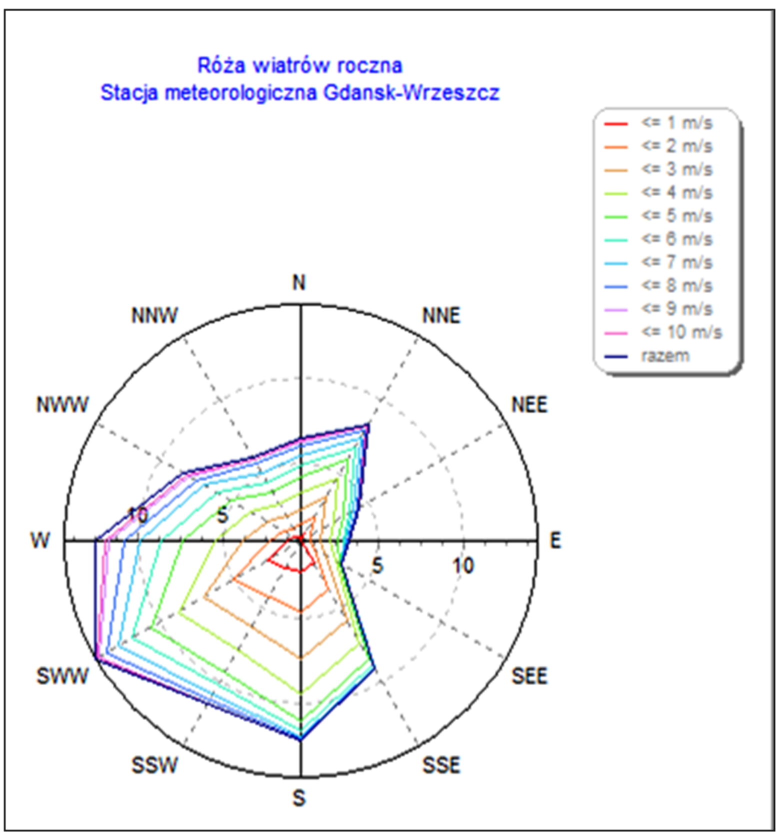

Figure 7: Data accepted for calculations from meteorological station Gdańsk-Wrzeszcz

Meteorological conditions determined with an average air temperature of 280 K and anemometer height: h_a=14m.

The aerodynamic roughness of the site was determined to be z_0= 0.393 m, according to the study "Air Protection Study - Annex No. 1" (compiled by. Marczak A., Krakowiak S., Kosecka M., December 2016), attached to DCT Gdańsk S.A.'s application for a permit to introduce gases and dust into the air and notification of the system, which application referred to T 1 and T 2. Based on the aforementioned study, emissions from the existing part of the terminal (T 1 and T 2) were also determined for the operational phase.

Sulfur dioxide SO2 emissions were not determined for technical vehicles (overhead cranes, tractors, hoists, stackers) and for diesel generators. This is due to the general requirements for SO2 content in diesel fuel. According to the general standard PN-EN590:2013, the maximum sulphur content is 10 mg/kg of oil, which means that SO2 emissions are negligibly small and insignificant for air quality. This is confirmed by both US and European news sources. In the standards used in Europe for diesel engines in vehicles on public roads (EURO standards) and for diesel engines in technical vehicles that can only operate on factory premises (STAGE standards), SO2 emission factors are not given. Ekodiesel Ultra Verva ON diesel used at the DCT Terminal meets the above mentioned standard.

It was assumed that 100% of the particulate matter emitted is PM2.5.

Calculations were performed in a 4800×3600 m grid, with a 100 m jump.

A minimum height of emitters of H = 5 m was assumed for the calculations due to assumptions in the calculation formulas - the power formula of low average wind speed and the assumption that the pollutant concentration at the point of emission is infinitely high, resulting in concentrations from low emitters being significantly overestimated in the results, distorting the air quality impact assessment.

The following formulas resulting from the reference methodology were used in the calculations:

Shortened range

For a set of emitters, the sum of the maximum concentrations is calculated to see if the condition is met:

(1) For a single emitter or set of emitters from which a replacement emitter is created:

$$S_{mm} \leq 0{,}1 \times D_1 \quad (1)$$

2) For a set of emitters:

$$\sum_{e} S_{mm} \leq 0{,}1 \times D_1 \quad (2)$$

where:

S_{mm} - maximum concentration

D1 - reference value or limit value of substance in air averaged to 1 hour

Full range

If the conditions of Equations 1 and 2 are not met, the distribution of the maximum concentrations of the substance in the air averaged for one hour, including statistics of meteorological conditions, shall be calculated in the calculation grid over the entire area over which the calculation is made to verify that the condition is met at each point on the ground surface:

$$S_{mm} \leq D_1 \quad (3)$$

If the above calculations show that the condition is satisfied for the set of emitters:

$$\mathbf{S_{mm} \leq 0.1 \times D_1} \quad (4)$$

then that is where the calculation ends.

On the other hand, for a set of emitters for which the condition defined by Formula (4) is not met, or for a single emitter for which the condition defined by Formula (1) is not met, the distribution of concentrations of the substance in the air averaged for a year should be calculated in the calculation grid and it should be checked whether the condition was met at each point on the ground surface:

$$\mathbf{S_a \leq D_a - R} \quad (5)$$

where:

S_a - concentration of the substance in the air averaged for a year

D_a - reference value or acceptable level of substance in the air averaged over a year

R - substance background

Reference values of substances in the air or permissible levels of substances in the air are considered to be met if the frequency of exceeding the D1 value by the concentration averaged for one hour is no more than 0.2% of the time in a year.

1.4.4 Methodology for calculating environmental noise levels

Due to the location of the project being evaluated, the project is being designed on the site of the operating Container Terminal at ul. Kontenerowa 7 in Gdańsk and the location of the nearest areas subject to acoustic protection at a fairly long distance (approx. 1000 m) it was decided that the most appropriate method of impact assessment would be the *calculation method.*

The basis for the impact assessment and calculations is the Polish Standard PN-ISO 9613-2 - Acoustics. Sound attenuation during propagation in the open space. The general calculation method that was implemented in the computer program SoundPLAN 7.4.

According to the current standard and legislation, the reference interval is taken:

- for daytime, the 8 most unfavourable hours between 6 a.m. and 10 p.m;
- for night time - 1 most unfavourable hour between 10 pm and 6 am.

The environmental noise impact assessment was performed according to the following assumptions in the calculation model:

- emission calculation standard - ISO 9613-2,

- assessment indicators – L_{AeqD} and L_{AeqN},
- noise sources - point, line and building type;
- multiple reflections;
- fixed height of the calculation grid above the ground equal to 1.5 m;
- 70% humidity;
- temperature of 10º C.

Accuracy and limitations of the method:

According to PN ISO 9613-2 standard, which describes the model of sound propagation in the environment, implemented in SoundPLAN 7.4 program, the attenuation of acoustic wave fluctuates as a result of changes in meteorological conditions on the path from the source to the observation point. It is assumed that for system noise, the accuracy of determining the equivalent sound level in the environment is ±3 dB.

2 Characteristics of the planned project

2.1 Current state

The deepwater container terminal DCT Gdańsk became operational in 2007.

DCT Gdańsk SA operates the DCT Container Terminal in Port Północny in Gdańsk under lease agreements concluded with Zarząd Morskiego Portu Gdańsk SA, which is a perpetual usufructuary of State Treasury property.

The area of the DCT Container Terminal includes a land part and a sea part; the land part has been partially filled with dredged material from the approach fairway.

The DCT Container Terminal (understood to be the DCT Gdańsk SA enterprise and at the same time a facility as defined by the Environmental Protection Law) currently consists of two functionally autonomous terminals: T 1 and T 2 (which are separate facilities within the meaning of the Environmental Protection Law).

The DCT Container Terminal provides port services related to handling of containers and other cargo transported primarily by sea. The Terminal handles containers and other cargo on the following routes: **ship - storage yard - land transport means** (cars or railway wagons) and vice versa. Some of the containers are handled in transit from and to: **ship - storage yard - ship**. It is also possible to handle containers from ship to truck, or vice versa, directly from land-based modes of transport to ships, bypassing the yard.

The terminal provides services in the **Lo-Lo** vertical reloading system (Lift on - Lift off) and horizontal **Ro-Ro** (Roll On / Roll Off).

In the first years after its establishment, the terminal specialized in handling feeder ships.

Since 2010, 8,000 TEU container vessels operating on direct connections from the Far East have called at DCT on a weekly basis.

In 2011, the terminal began handling PS and E class container ships and then Triple E class container ships with a capacity of 15,500 TEUs, followed by larger vessels. The largest vessel handled to date had a capacity of 21,500 TEU.

In **2017** , the terminal handled a total of nearly **1.6 million TEUs**.

In January 2015, construction of the terminal's new quay began with the aim of significantly increasing DCT's handling capacity to 3 million TEUs. This investment was carried out in accordance with the ***decision of the Regional Director of Environmental Protection in Gdańsk No. RDOŚ-Gd-WOO-4211.29.2013.AT.9 on the determination of environmental conditions for the project "Construction of Container Terminal T 2 with a capacity of 2 500 000 TEU in Port Północny in Gdańsk"***. In autumn of 2016, these investment phases were completed to bring the loading berth and some of the storage and communication space into operation. The planned target scope of DCT's expansion under T 2 will allow it to reach an annual handling capacity of 3.5 million TEU.

The photo below shows the current shape of the DCT, indicating the terminals: the so-called **T 1** (launched in 2007) and the so-called **T 2** (launched in 2016).

Figure 8: View of the existing DCT terminal from the south
Source: DCT/fot.aeromedia.pl
(The figure indicates the T 1 and T 2 terminals that make up the entirety of the current shape of the DCT container terminal).

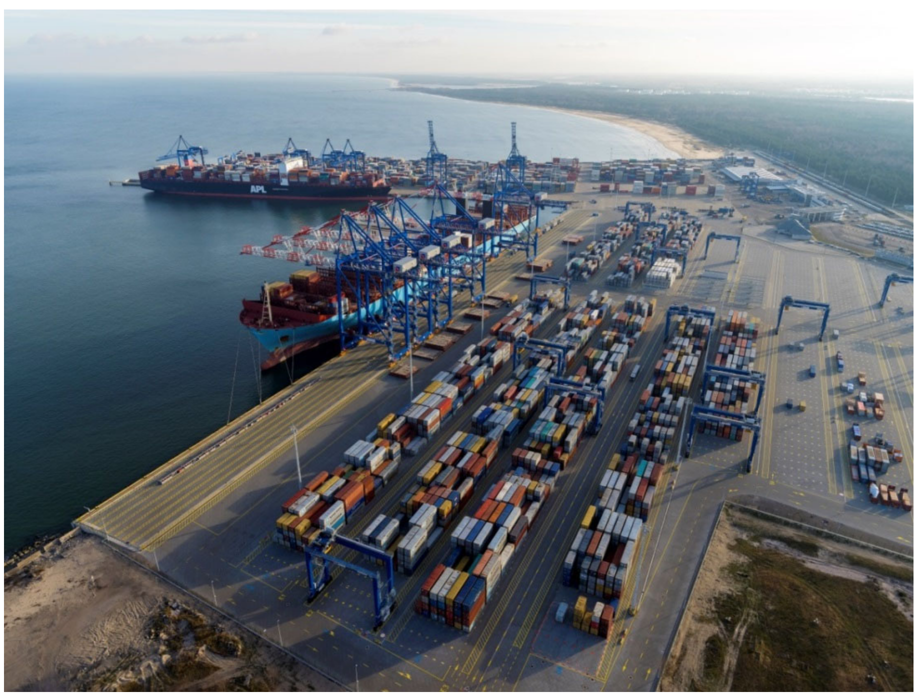

Figure 9: View to the north-west of the existing DCT terminal
Source: DCT/fot.aeromedia.pl

Figure 10: Water side view of the existing DCT terminal
Source: DCT/fot.aeromedia.pl

Among the services served by DCT, long-haul commercial connections are strategically the most important. An example of these connections is provided in the diagram below (as of May 2018).

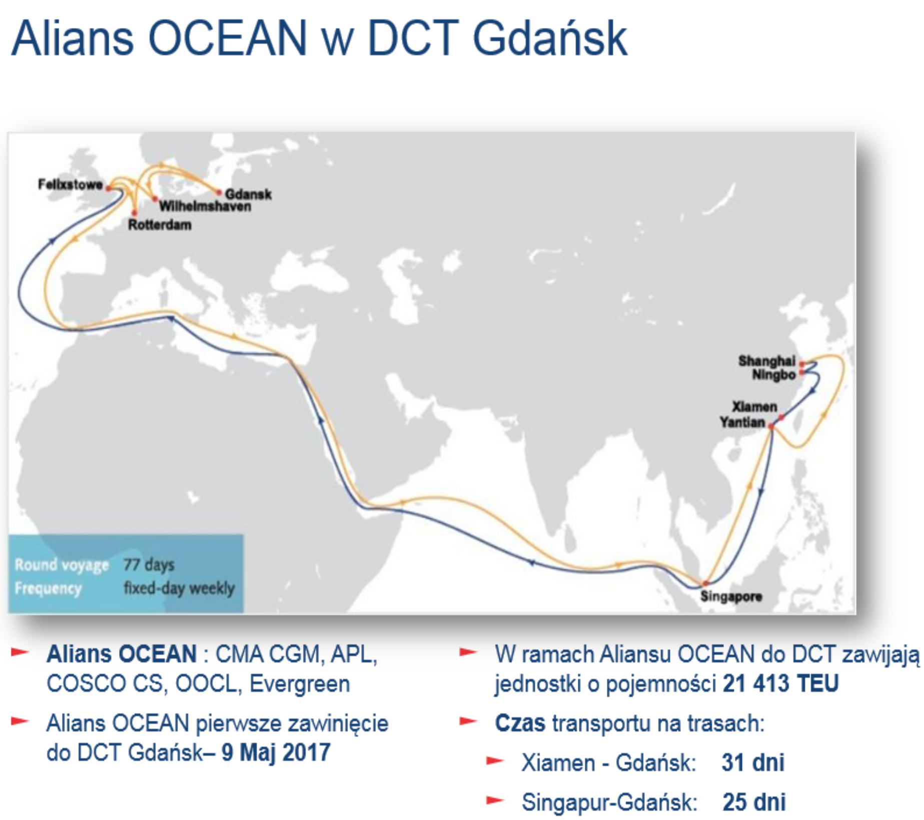

Figure 11: Ocean Connections - Alliance Ocean

Currently, the Terminal as a plant covers an area of approximately 90 ha and the operating length of the two loading quays (T 1 + T2) totals approximately 1,300 m. The terminal operates 11 quay cranes[4] (super-post-Panamax and post-Panamax) and 35 mobile cranes. An additional three quay cranes (currently in production) and five self-propelled electric yard cranes are planned to be placed in service[5].

Figure 12: Quay cranes – STS

In addition, the Terminal is serviced by: approximately 70 internal tractors, adapted to transported ISO containers, lift trucks for full containers, lift trucks for empty containers, mobile trucks.

The railroad siding operates on the basis of four loading tracks with an operational length of 620m. It is currently undergoing expansion to 7 tracks with an operational length of 750m each.

Container storage yards are divided into sectors, where containers are arranged in so-called blocks. A typical block consists of 7 containers stacked side by side; there can be up to 5 containers (layers) in each riser. Vehicles moving containers are driven along traffic lanes separating individual sectors.

Cooling containers, supplied with electricity from transformer stations located in the vicinity of the storage blocks, are stored in separate areas.

[4] The quay crane is abbreviated as STS after its English name**: Ship-to-Shore Gantry Crane** (http://www.konecranes.com/equipment/container-handling-equipment/ship-to-shore-gantry-cranes), (https://www.liebherr.com/en/dnk/products/maritime-cranes/port-equipment/container-bridges/ship-to-shore-container-cranes.html), (https://dctgdansk.pl/pl/zielony-przetarg/)

[5] The self-propelled yard crane is abbreviated as RTG after its English name: **Rubber-Tyred Gantry Crane**. (https://dctgdansk.pl/pl/elektryczne-suwnice-rtg/) (http://www.konecranesusa.com/equipment/container-handling-equipment/rubber-tired-gantry-cranes)

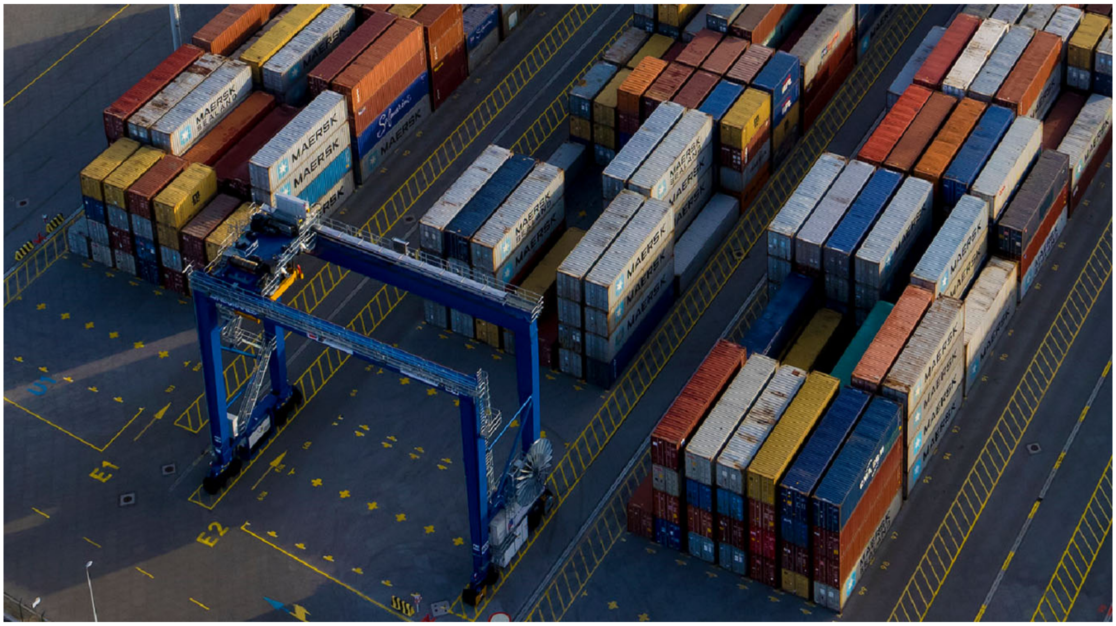

Figure 13: Containers stored in blocks
A yard crane is also visible in the drawing.

In addition, within the Terminal (plant) there are: a warehouse for handling works, a workshop building, an administration building, a gate complex, a main power switching station (GPZ), a pumping station building with a power generator, a transformer station, a fire water tank. The following were built to service the vehicles: a car wash, a truck scale, and a gas station.

The following networks and equipment are located at the DCT Terminal:

- electric power industry:
  - 0.4kV low voltage cable network,
  - medium voltage SN 15 kV cable network from GPZ to PZ DCT,
  - lighting poles,
- water and sewerage industry:
  - Port Północny water supply,
  - Port Północny sanitary pressure sewer system,
  - storm sewers and road drainage,
  - rainwater system,
- ICT industry:
  - telecommunications cable ducting,
  - cable telecommunication line, telephone cables,
  - telecommunication cable line fibre optic cables.

2.2 Subject of the planned project

The purpose of the project is to extend the existing deepwater maritime container terminal operated by DCT Gdańsk SA as port operator,[6] , by adding a T3 terminal. This will lead to the creation of three additional quays with a total length of approximately 1,650 m adjacent to the existing T1 terminal.

Expansion of the facility in the first phase of the expansion will enable to increase the handling capacity of the DCT terminal by approx. 1.3-1.7 (max 2 million TEUs[7]) In the next two phases the annual handling capacity of the DCT terminal is to be increased by another 1.3-1.7 (max 2) million TEUs. After the completion of the entire expansion, described in this report under the working title T 3, the handling capacity of the DCT terminal will reach 8 million TEU/year.

The site of the planned project is located in the area of the existing DCT terminal, within the boundaries of the port of Gdańsk:

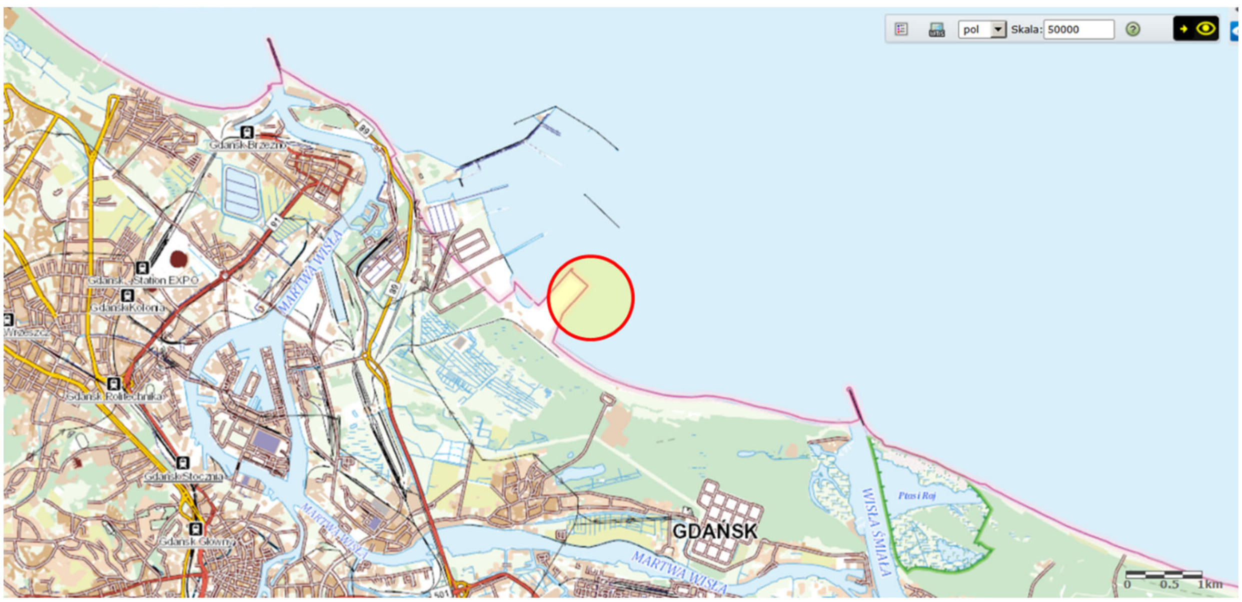

Figure 14: Area of the planned investment
Own elaboration based on geoportal.gov.pl (the red circle indicates the investment area).

The project, provisionally called the terminal **T 3**[8]consists of the construction of a new facility as port infrastructure for loading and unloading, connected to land, located within the Port of Gdańsk. Terminal T 3 will be technically connected and adjacent to Terminal T 1, but will be technologically independent of T 1 and functionally autonomous.

The planned **T 3** Container Terminal will include a handling quay, which will be constructed as an extension of the existing **T 1** terminal yards to the north and east.

Up to **95 hectares** of marine area will be infilled.

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[6] The expansion of the terminal does not touch land at all, but is to be implemented towards the water.
[7] TEU = twenty-feet equivalent unit
[8] Name: **Terminal T 3** is an informal, working term introduced by the Author Team for the purposes of this Report, referring to the nomenclature adopted for the earlier Terminal (T 2) expansion. As the project will be executed in phases it cannot be excluded that the phases will be assigned separate or different numbers or names by DCT Gdańsk SA. This report relates to all planned stages of the project, which according to the requirements of the EIA Act should be covered by one decision on environmental conditions.

In the area of harbour waters adjacent to the newly built quays, dredging works will be performed in order to create an approach and maneuvering basin for the planned **T3**berth.

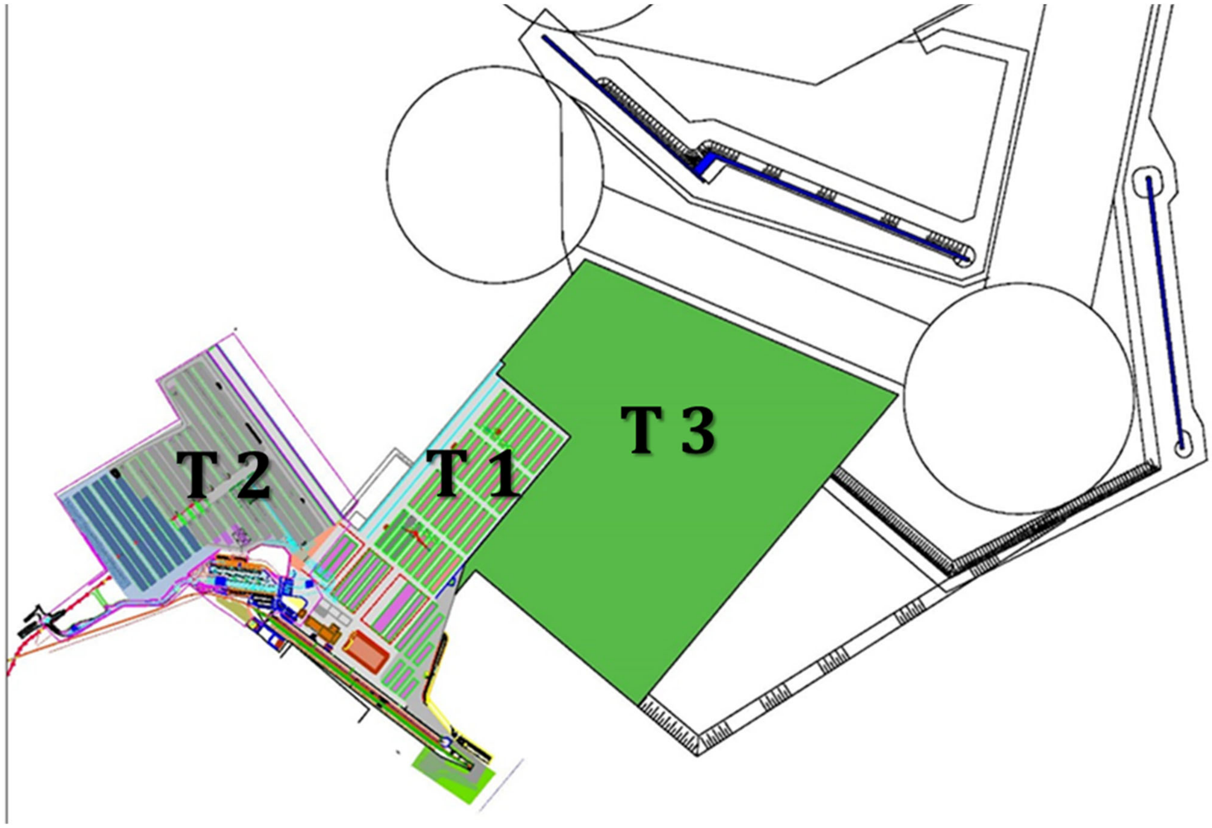

Figure 15: Location of the T 3 terminal in relation to the existing T 1 and T 2 terminals

The solid area in dark green represents the target shape of the new terminal section in the figure above.

Figure 16: Location of T3 terminal in relation to existing terminals T1 and T2 - aerial photo
Source: DCT/fot.aeromedia.pl

Figure 17: Investment on the background of topographic map
Source: Own elaboration based on geoportal.gov.pl

Figure 18 Visualization of DCT's berth transformation after implementation of the planned terminal expansion - bird's eye view from the southern side.
Source: Author's compilation based on GoogleEarth underlays, which do not yet show the T2 terminal

As can be seen from the above drawings, the project will be carried out exclusively on sea water. In addition, dredging will be carried out to the east - also exclusively in the offshore area.

Figure 19: Existing and new loading quays
*In the figure above, the **existing** loading quays are indicated by the "moored" rectangle next to them in **yellow**, and **the new** quays are indicated in **red**.*

Construction of the quays and storage yards, circulation areas and other elements of Terminal T 3 will be phased. The approximate spatial distribution of these stages is presented in the figure below.

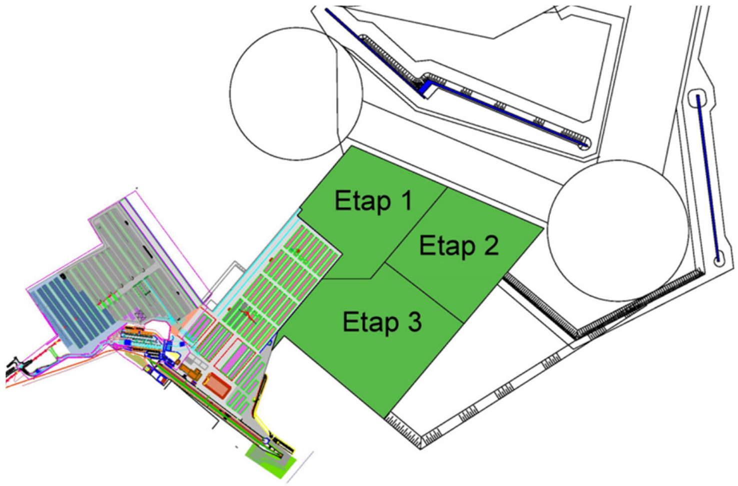

Figure 20: Spatial phasing of the project.

The numbering of stages does not imply the necessity to execute them in the order resulting from this numbering. Depending on infrastructural and formal conditions, the extension may start both from the part marked as **Stage 1** and from the one marked as **Stage 3** (for technical reasons it cannot start from the part marked as **Stage 2**).[9]

An additional necessary element of the project is the dredging of the basin to the east of the T3 terminal to allow berthing of ocean-going vessels coming to DCT Gdańsk. An area of approximately 38 ha will be dredged.

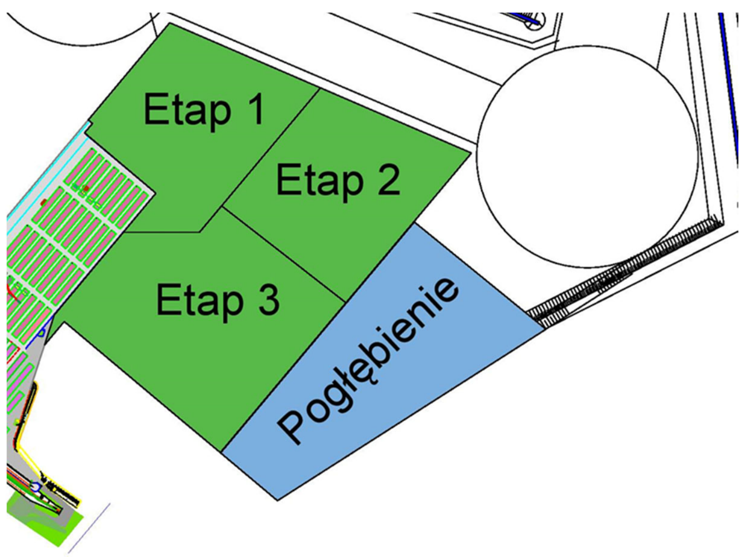

Figure 21: The area of dredging works.

[9] Due to the fact that the decision on environmental conditions does not create any rights to the investment area and does not infringe on any property rights and rights of any third parties - the issue of any further agreements, obtaining rights to the land and other such issues, which will determine the spatial range of the project and the sequence of stages, go beyond the subject of the case for issuing this decision and the scope of analyses performed at the current stage of the project preparation process.

During the operations phase, the use of the T 3 terminal will be functionally related to the T 1 and T 2 terminal facilities, while maintaining the distinctiveness and integrity of each facility.

2.3 Location of the planned project

The area planned for the project includes the area for the T 3 terminal facilities and the harbour water area, which will be dredged and regulated. In connection with the construction of the T3 terminal, adaptation works will be required to connect the T 1 and T 3 areas through the technical infrastructure (connections), which will be implemented as separate projects, functionally linked to T 3. The area of the existing terminal T 2 (including the area provided for its expansion), can be potentially used for the organization of construction facilities.

The site consists of the following plots and bodies of water:

T 3:	**body of internal sea waters not defined in the land register - within the boundaries defined by the hexagon with the geographical coordinates of the vertices: 18° 43' 33'', 54° 23' 30''; 18° 43' 09'', 54° 22' 58''; 18° 43' 18'', 54° 23' 21''; 18° 43' 50'', 54° 22' 41''; 18° 44' 25'', 54° 23' 16''; 18° 44' 56'', 54° 23' 04''.**
T 1 + T 2 + T 3 (DCT Terminal as a plant within the meaning of Environmental Protection Law)	Gdańsk, precinct 86: 69, 70, 72, 75/1, 75/2, 104 Gdańsk, precinct 144: 45 body of internal sea waters, not specified in the land register - with the following boundaries: on the west - Rudowa Pier, on the east - DCT Terminal 1 wharf, on the south - the coastline, and on the north - the line determined by points with geographical coordinates: 54°23'37,17"N; 18°43'4,42"E and 54°23'20,81"N; 18°43'18,43"E. an area of internal sea waters not specified in the land register - within the boundaries determined by a hexagon with geographical coordinates of vertices: 18° 43' 33'', 54° 23' 30''; 18° 43' 09'', 54° 22' 58''; 18° 43' 18'', 54° 23' 21''; 18° 43' 50'', 54° 22' 41''; 18° 44' 25'', 54° 23' 16''; 18° 44' 56'', 54° 23' 04''.

Figure 22: Area of the planned investment on the aerial photography
Own compilation based on DCT/phot.aeromedia.pl (red ellipse marks the investment area)

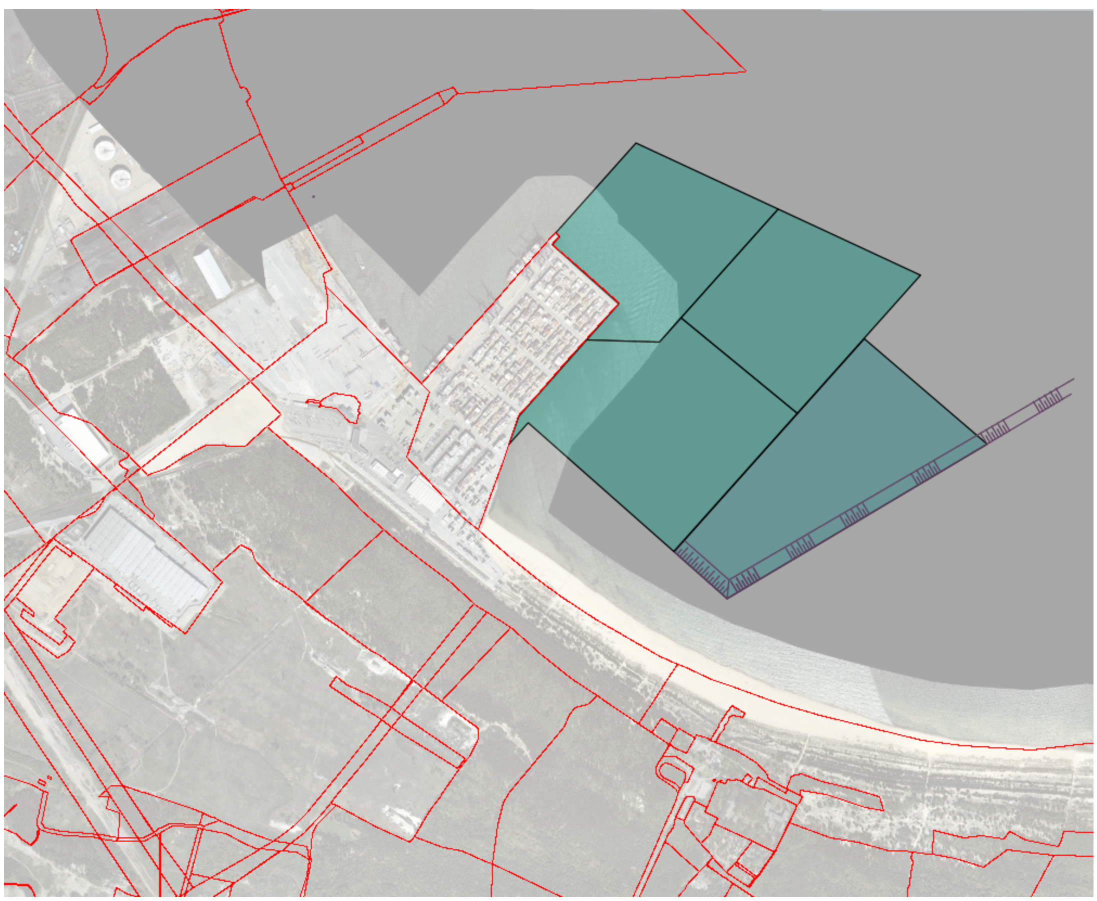

Figure 23: Investment on the background of the cadastral map
Own elaboration based on geoportal.gov.pl

Based on the analysis of the spatial data, a table was prepared to determine the resulting T 3 terminal area, the individual T 3 stages, and the dredged area - along with the extreme values of the plane coordinates.

Table 2: Terminal area T 3, individual stages and dredging area - with extreme values of PL-1992 rectangular coordinates10

	TERMINAL T3 - EXPANSION				
Total surface area (ha)	**MIN_X**	**MAX_X**	**MIN_Y**	**MAX_Y**	
approx. 95	**481778**	**483161**	**723969**	**725341**	
Stages:		**Surf_ha**			
Expansion of T3 terminal	Stage 1	approx. 28			
Expansion of T3 terminal	Stage 2	approx. 28			
Expansion of T3 terminal	Stage 3	approx. 39			

	DREDGING				
Total surface area (ha)	**MIN_X**	**MAX_X**	**MIN_Y**	**MAX_Y**	
approx. 38	**482333**	**483385**	**723811**	**724683**	

	TOTAL AREA: TERMINAL + DREDGING
Total surface area (ha)	
approx. 133	

The above figures are estimates and can only be refined during the construction project phase. However, this estimation is precise enough to carry out an environmental impact assessment of the planned project.

The area planned for the realization of the planned project (T 3) is contained in the area determined by the coordinates of 6 extreme points delimiting the area. The table below gives the values of these coordinates in three different formats, as:

- PL-1992 rectangular plane coordinates,
- geographic coordinates expressed in degrees,
- geographic coordinates expressed in degrees, minutes and seconds.

Table 3: Coordinates of the 6 extreme points defining the area in which the project site is included

	Coordinates EN-1992(*)		Geographical coordinates			
Point No.	X_92	Y_92	Longitude	Latitude	DMS_lenght	DMS_width
1	725339	482201	18.7258	54.3918	18° 43' 33''	54° 23' 30''
2	724329	481775	18.7193	54.3827	18° 43' 09''	54° 22' 58''
3	725038	481934	18.7217	54.3891	18° 43' 18''	54° 23' 21''
4	723815	482500	18.7305	54.3781	18° 43' 50''	54° 22' 41''
5	724899	483147	18.7404	54.3879	18° 44' 25''	54° 23' 16''
6	724528	483688	18.7488	54.3845	18° 44' 56''	54° 23' 04''

[10] Coordinates according to the 1992 Coordinate System (EPSG: 2180), in accordance with the Regulation of the Council of Ministers of 15 October 2012 on the national spatial reference system (Dz.U. 2012, item 1247).

(*) The accuracy of determination of these points can be estimated to be approximately 20 m

The figure below shows the points that mark the vertices of the polygon described by the coordinates given in the table above.

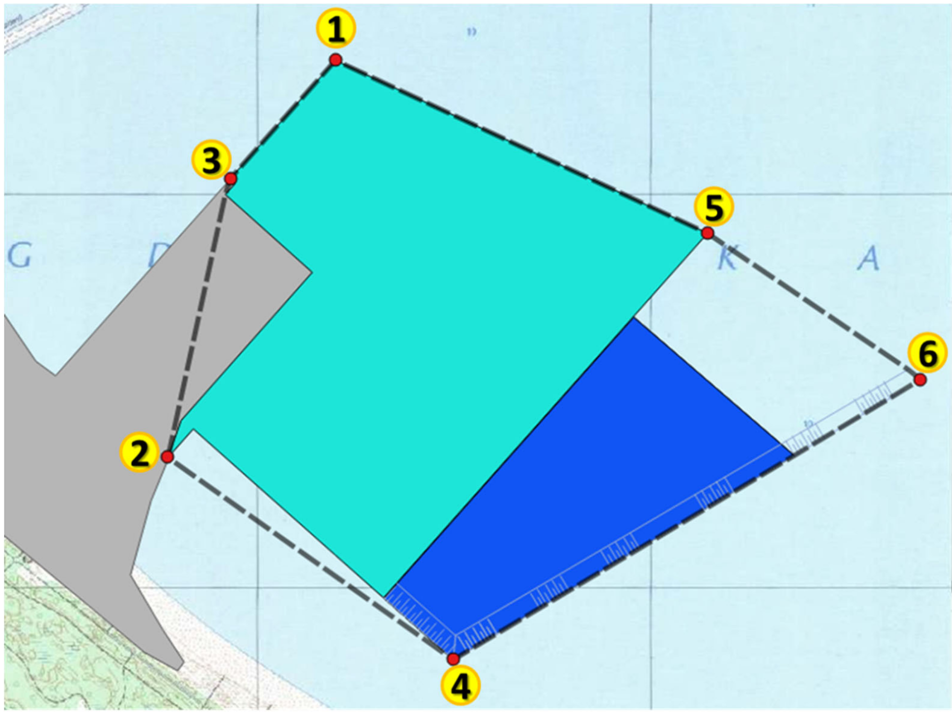

Figure 24: Extreme points delimiting the project area

The Project site will not exceed the area defined in the table above.

The Project, in selected scopes of functional connection (e.g., reconstruction of stormwater drainage system, extension of transformer station, extension of buildings) may encroach deeper into T 1 or T 2 area.

2.4 Characteristics of the area of the planned project

Regarding the part of the terminal related directly to sea transhipment, DCT currently consists of four modules:

- **NP-T1** = Terminal T1 loading berth,
- **PS-T1** = Storage yard of Terminal T1,
- **NP-T2** = Terminal T2 loading berth,
- **PS-T2** = Storage yard of Terminal T2.

The planned project will lead to the construction of six analogous modules in the marine basin:

- **NP-T3A** = Terminal T3 loading berth - phase 1,
- **PS-T3A** = T3 terminal storage yard - phase 1,
- **NP-T3B** = Terminal T3 loading berth - phase 2,
- **PS-T3B** = Storage yard for Terminal T3- phase 2,
- **NP-T3C** = Terminal T3 loading berth - phase 3,
- **PS-T3C** = storage yard of terminal T3- phase 3.

In the figure below, the yellow rectangles represent vessels moored at existing (orange) wharves, and the red rectangles represent vessels moored at (pink) wharves to be constructed as part of the project.

The figure below shows the above modules of DCT Gdańsk SA facility.

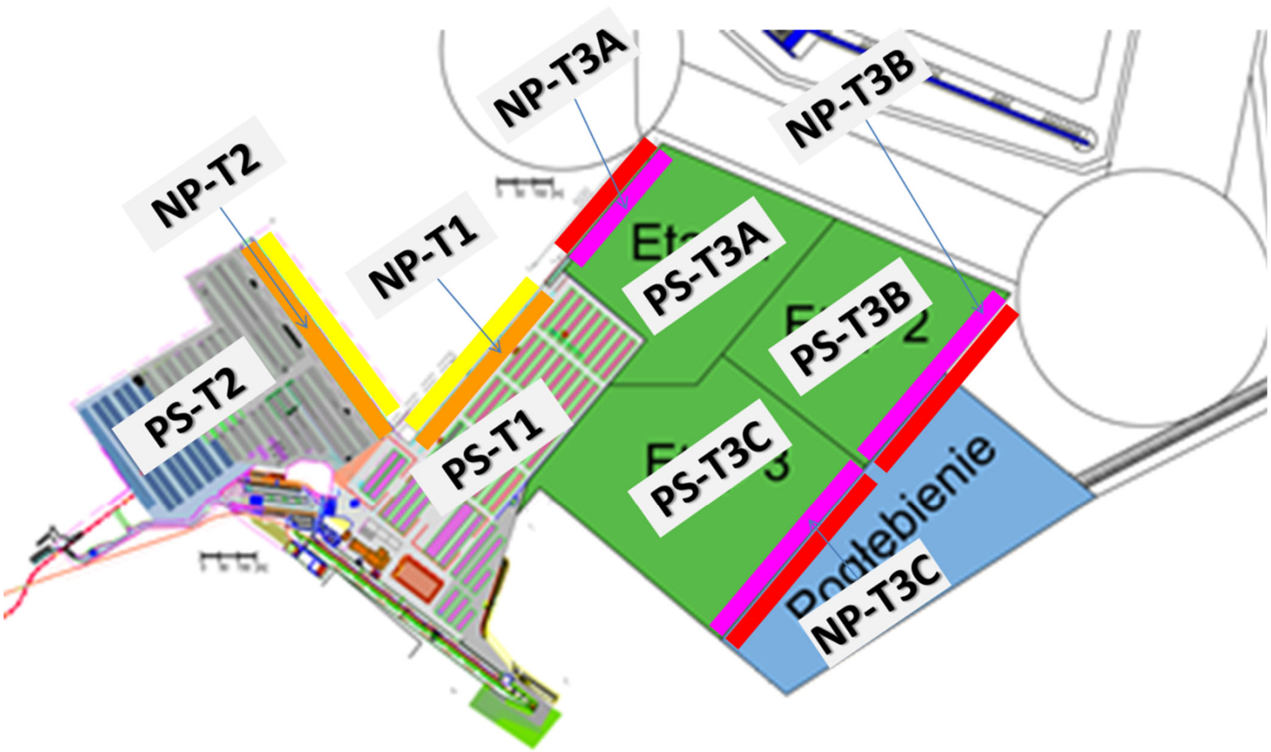

Figure 25: Handling and storage modules forming the "marine" part of the DCT Gdańsk SA facility

2.5 Basic facilities and equipment

The basic parameters of the DCT terminal at present and after the extension to Terminal T 3 are as follows:

- T 1 + T 2
  - 11 quay cranes (STS) (+3 purchased, currently in production),
  - 35 self-propelled yard cranes (RTGs),
  - 15 self-propelled electric yard cranes (eRTG) (+ 5 purchased, under delivery),
  - terminal area - about 90 ha,
  - length of reloading quays - approximately 1300 m,
  - handling capacity - approximately 3 million TEU.
- T 3:

Terminal T 3 will also be operated by quay cranes (7-9 gantry cranes per quay) and by overhead cranes, with specific solutions including the use of rubber tyred gantry cranes (RTG), electric rubber tyred gantry cranes (eRTG), rail mounted gantry cranes (RMG), or automated rubber tyred or rail mounted gantry cranes (aRTG/aRMG) operating in one of the many solutions already available on the market operating under English names: Automated Stacking cranes (ASCs), Cantilever RMGs, Automated straddle carriers (Autostrad), or any other system of automatic or semi-automatic operation, not excluding a system where the use of RMG and RTG is practically eliminated, the so-called Bridge Crane Terminal. For guidance and calculation purposes, it has been assumed that there will be 30-32 rail-mounted electric gantry cranes (RMG) per new quay at Site T 3 - a total of 90-96 RMGs, but the actual selection of equipment will occur at a later stage, and this selection will be made such that the environmental impact will be that resulting from RMG operation or less. The area of the new terminal will be approx. 95 ha and the length of the reloading quays will be approx. 1650 m. The handling capacity of T3 will reach approximately 4.5 million TEU per year.

In addition to overhead cranes, container distribution equipment within the terminal is or may be additional equipment, which, however, is no longer found in such large numbers, other than vehicles for transporting one or two containers within the terminal, e.g., from ship to train, or vice versa. Currently DCT uses diesel-powered terminal tractors (called "IMVs" in DCT), the number of which at the terminals is estimated at around 7 per crane, however this function can be fulfilled by various other vehicles, such as AGVs (automated guided vehicles), AS (auto shuttle), SC (straddle carrier) and many other types, which can be powered by electricity or other non-diesel fuels, such as CNG, LNG, LPG. For guidance and calculation purposes, it has been assumed that there will be approximately 200 diesel-powered terminal tractors operating at Site T 3, but the actual selection of equipment will occur at a later stage, and this selection will be made in such a way that the environmental impacts will be those resulting from the operation of diesel-powered terminal tractors or less.

Figure 26: Terminal tractor at DCT

The planned development area of Container Terminal T 3 will be, approximately:

T3 TERMINAL SUB-ASSEMBLY ELEMENT	SIZE[11]
handling quays	1650 linear meter / 14.4 ha
storage yards for solid containers	50 ha:
storage yards for refrigerated containers	10 ha:
storage yards for empty containers	10 ha:
communication	10 ha:
lorry parking	200 spaces (2 ha)
multi-storey parking lot	600 spaces (1 ha)
enclosed building (built-up area)	2 ha:
Total - Container Terminal T 3	approx. 95 ha

The following provides information on the major facilities that comprise Terminal T 3.

2.5.1 Quays

The planned new quays (north and east) will have a total length of approx. **1,650 m** and the water depth at the berth will be approx. -17.5 m Kr (according to the PL-KRON86-NH elevation system).

The quays of terminal T 3 will be equipped with: points for drawing water from the port system; electrical switchboards for supplying power to the ship's equipment while stationary; chambers with electrical switchboards for supplying power to the cranes; rainwater drainage outlets; mooring bollards; rescue ladders; fender devices; lifebuoy racks; and other typical elements comprising the berth infrastructure.

2.5.2 Storage yards

The T 3 terminal will include the following types of storage yards:

- storage yards for solid containers - storage height 5+1, total capacity of yards about **150 000** containers,
- storage yards for empty containers - yard capacity of approximately **50,000** 20-foot containers,
- refrigerated container storage yards - approximately 1,000 sf for refrigerated container storage; yard capacity of approximately **5,000** refrigerated containers - 20-foot or 40-foot, powering the refrigerated containers from approximately 10 transformer stations planned for construction,

and communication areas.

2.5.3 Parking areas

In connection with the expansion of the terminal, it is planned to construct parking areas for trucks and working machinery for about 200 vehicles, with an area of about 2 ha. In addition, it is planned

[11] The parameters specified in this characterization in approximate values, in order to maintain the validity of the conclusions of the environmental impact assessment, may have a deviation of no more than 20% during the design process. Among other reasons, the sum of the individual areas in the rows does not add up to the value given in the summary.

to construct a storied parking lot for passenger cars (enclosed building), with a building area of approximately 1 ha.

2.5.4 Enclosed structures

In connection with the expansion of the terminal, it is planned to construct buildings with workshop, office and social functions. The area occupied by these buildings will not take up more than 1 hectare. The development area pertaining to these facilities shall be contained within the area provided for:

- storage yards for solid containers,
- storage yards for refrigerated containers,
- storage yards for empty containers,
- communication.

2.5.5 Systems, infrastructure

Media supply and network provisioning will be carried out using the existing infrastructure of the Port of Gdańsk Authority. Adequate infrastructure of the following systems will be provided: electrical power with site lighting, sewerage, water supply, telecommunications and gas.

After construction, if necessary, of a new substation (or several) at Site T 3, electricity will be supplied via medium voltage cable lines to the quay cranes, ship supply switchgears and transformer stations. Power will be distributed from the transformer stations to all Terminal facilities and equipment.

The enclosed buildings will be supplied with heat through the use of electricity or through the use of gas-powered equipment - with adequate capacity, adapted to the size of the buildings.

The storm sewer network will be provided with separators and sand traps, and storm sewer outlets will be directed to harbour waters (outlets will be located in the wharf or breakwater or other shoreline structures (specially constructed) that can be used for this purpose).

The storm sewer system will capture rainwater or snowmelt from all impervious surfaces of the Terminal, i.e., roads and empty container storage yards.

For the purpose of calculations it was assumed that the whole area of the terminal will be watertight and this option can also be considered by DCT, however as an acceptable option is to differentiate the permeability of different functional areas of the terminal so that for example only the communication areas are completely watertight, and the storage areas not necessarily. The use of such a covering of the terminal surface is also not excluded, which on one hand makes it a completely hardened surface, and on the other hand the porosity of the surface material (e.g. the so-called porous asphalt[12]) makes it practically permeable for rain, thanks to which there is no need to capture rainwater to the sewage system, but the water is absorbed by the ground and drained away in a natural way through the layers of the ground.

Rainwater collected by the stormwater drainage system will be treated to reduce suspended solids and oil-derived substances before being discharged to the receiving body (harbour water).

[12] https://maineswc.files.wordpress.com/2017/10/02-savage-and-luce.pdf

2.5.6 Facilities functionally related to the planned project

The planned investment will also partially encompass the area of Terminal T 1 due to the necessity, resulting from the optimization, of carrying out adaptation changes of significance for Terminal T 1, caused by the establishment of Terminal T 3, concerning in particular the technical infrastructure of the plant, which will have to be adapted to serve the terminals as a whole. Adaptation works outside the area of the T 3 system will include such activities as e.g.: reconstruction of the company fuel station, reconstruction and expansion of enclosed buildings objects, including the administration building including change of the function of rooms, buildings of the maintenance department, change of the power supply system and reconstruction of transformer buildings, reconstruction of the fire pumping station, reconstruction of the gate complex, change of traffic organization, change of traffic organization in front of the terminal gate, covering the T 3 terminal with CNG or LPG power supply, if such will be implemented, application of uniform LED or other light sources.

In connection with the expansion of the terminal it is planned to build parking spaces outside the terminal - within the boundaries of the port area leased from ZMPG SA.

There may also be a need to expand the car wash and gas station.

The existing rail siding will also be expanded to accommodate Terminal T 3.

2.6 Operation phase

The operations of the DCT Container Terminal, including the T3 terminal, will be analogous to the existing ones, for example:

- arrival of a large container ship at the terminal,
- unloading of a large container ship in Lo-Lo technology with quay cranes on the handling quay (quay cranes move the container to and from the ship) / unloading of a large ship (e.g. with containers) in Ro-Ro technology with tractors and container trailers,
- moving containers by means of yard cranes to storage yards,
- arrangement of containers on the storage yard in appropriate storage blocks depending on the nature of the container (full containers, empty containers, refrigerated containers, hazardous materials) with the use of yard cranes and specialized terminal equipment,
- moving containers between yards using wheel sets (a wheel set consists of a truck tractor and a container semi-trailer),
- rail loading using a gantry crane,
- road loading,
- loading onto a feeder vessel / large container vessel using the same equipment used for unloading.

The operation of the terminal will be bidirectional. This means that containers delivered by land to the terminal will be reloaded and then further shipped by sea. Activities conducted at the terminal site will be analogous to those described above.

It is estimated that there will be weekly calls at all DCT terminals (T 1 + T 2 + T 3):

- 7-9 ocean-going vessels, the largest of which have a capacity of more than 20,000 TEUs,
- 35-55 feeder vessels (typically 300-5,000 TEU).

The DCT Container Terminal operates and will continue to operate 24 hours a day, 7 days a week, 365 days a year in a 2- or 3-shift system, which will employ a total of 1,500-3,600 workers directly at the terminal, which depends on the degree of use of automated equipment, operating remotely without direct involvement of the operator. The chapter "Social and Economic Significance of the DCT Terminal Expansion" points out additional effects, including multiplier effects of creating jobs at DCT.

In its exploitation phase, the Container Terminal will definitely improve the functioning of the container handling system in Port Północny in Gdańsk and ensure efficient use of the city's and the region's currently emerging transportation system, which has already been assumed to have a container terminal of the assumed capacity.

Currently, it is assumed that the maximum transportation by a given mode will not exceed the values indicated in the diagram below.

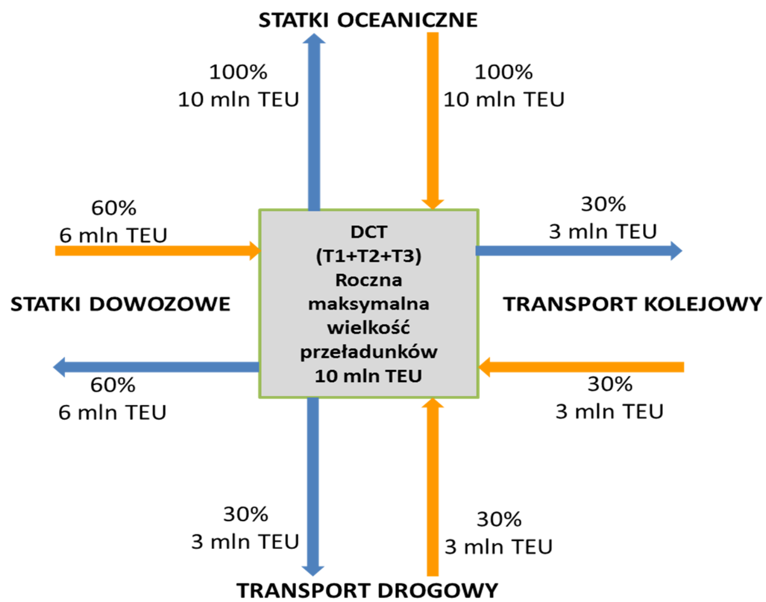

Figure 27 Expected maximum share of each mode of transport in cargo handling at DCT Gdańsk SA (defined as T 1 + T 2 + T 3 (stage 1 + stage 2 + stage 3)); values in TEU per year

[Where no reliable data were available, e.g. transport indicators, the annual handling volume of 10 million TEU was assumed for the calculations in order to use the values inflated in relation to the predicted target handling capacity of the terminal, which is to amount to 8 million TEU, for further analyses in the Report. This ensures that the results of the analyses include a margin of safety that is more sensitive to forecasting uncertainty]

During the operations phase, it will be necessary to ensure proper operation of the T 3 terminal, including primarily maintenance and proper handling of water, wastewater, and waste management. The scope of work will include, but is not limited to:

- maintenance and repair of equipment and facilities,
- repair and maintenance of storage facilities and transportation assets,
- proper operation of the transportation system,
- repair damage and cracks in storage and traffic surfaces,
- maintaining the fence in proper condition,
- snow removal and deicing,
- waste disposal,
- proper management and care of greenery.

After the expansion and commissioning of the planned project at the DCT Container Terminal (facility), the land use will not be changed and there will be no impediments to the use of adjacent areas.

2.7 Construction phase

The construction phase activities described in this section may be conducted in a modified manner, but the solutions adopted should provide at least the same level of environmental protection as is provided by the solutions described in this Report, as demonstrated in the documentation associated with the construction project.

The planned construction of Terminal T 3 will be divided into phases. Specific phases will include:

- **phase 1**, the first two years of implementation: construction of new quays with a length of about 500 m enabling the handling of vessels with a draught of not less than 15 m, together with adjacent maneuvering and storage yards suitable for handling containers and Ro-Ro cargoes with an area of about 30 ha; development of infrastructure networks; parking lots, buildings;
- **phase 2**, from the second to the sixth year after the start of construction: construction of another quay of about 500 m in length capable of handling ocean-going vessels, further yards of ~30ha, parking lots and internal roads; expansion of the railroad siding and construction of new technical and administrative buildings;
- **phase 3**, from the fifth to the twelfth year after the start of development: construction of another quay of about 500 m capable of handling ocean-going vessels, further yards of ~30 ha; parking lots, buildings.

In phase one, one of the parts of the terminal designated earlier in this report as either Stage 1 or Stage 3 will be constructed; in phase two, either Stage 3 or Stage 1; and in phase three - Stage2. It is also possible to carry out the construction work in such a way that the above-mentioned scope of individual phases is combined, so that, for example, the combined scope of phase 1 and phase 3 is carried out first. The undertaking of the various phases of the project and their duration will depend on market factors.

In connection with the execution of the planned project the following seabed works will be required:

- dredging of the approach and manoeuvring fairway in the sea area from the current depth of 7 m to the depth of 17 m on average - the works will be conducted in an area not exceeding 40 ha and the maximum quantity of excavated material will amount to 4,000,000m^3 (approx. 10,000,000 tonnes);
- strengthening of the seabed in the area where the T3 terminal will be constructed - the works will be carried out in an area not exceeding 100 ha; the works will be performed by recognized geotechnical methods applicable to the seabed.

Work will be performed from the sea and from the T 1 site. Vessels will use publicly available moorings and, as work progresses, will use the mooring berth specifically arranged within the existing T 1 and T 2 terminals, including the eastern part of the T 1 terminal that is not currently used for container ship moorings, as well as possible elements of the T 3 terminal that may be used as work progresses.

Construction facilities will be allowed to be located in an area set aside for that purpose on the parcels encompassed by Site T 2: Gdańsk, precinct 86: 69, 70, 72, 75/1, 75/2, 104; Gdańsk, precinct 144: 45, as well as on the T 1 terminal, and then on the finished T 3 fragments.

The design depth at the quays for Container Terminal T 3 will be 17.0-17.5 m.

According to the present practice and analysis, a part of the excavated volume will be silts requiring transportation by dump barge to the sea dumping site designated by the Maritime Office in Gdynia, whereas a part of the excavated volume will be sands which can be used as a refill material.

Using the conclusions in:

- "Report on environmental impact of dredging and reefing works for the construction of the ICC in Gdańsk" (volume 08, reg. no. W/171) - study by assistant professor Rajmund Dubrawski Ph.D. and his team, dated September 2004, with an annex prepared by the Polish Geological Institute - Marine Geology Branch (Joanna Zachowicz, Ph.D.) concerning studies on the quality of excavated material deposited in the Working Basin of Port Północny,
- Report on environmental impact for the project entitled: “Falochrony osłonowe w Porcie Północnym w Gdańsku (Protective breakwaters in the Port Północ in Gdańsk)”, Orbital Sp. z o.o., Gdynia, September 2015,
- The report on the environmental impact of the project titled "Rozbudowa toru podejściowego z powiększeniem jego szerokości i głębokości technicznej wraz z wykonaniem obrotnicy o średnicy 750 m (Expansion of the approach fairway with an increase in its width and technical depth along with the construction of a turning basin with a diameter of 750 m)”, Transprojekt Gdański Sp. z o.o., Gdańsk, May 2015

it should be concluded that the planned dredging-replenishment works do not require any precautionary measures or shielding that would need to be incorporated in the design if a mechanical backfill suction dredger is used for the works and the speed of the dredger does not exceed 1 knot (this speed also applies to the movement of the scarps[13] disposing of the spoil on the

[13] Dump barge - a type of vessel used to carry dredged material extracted by dredgers. It is equipped with bottom or side flaps for quick ejection of the load.

spillway in order to enable an even distribution of the spoil on the seabed in the spillway area). Since other types of dredgers are better suited for certain activities - the possibility of using other dredgers for these purposes, e.g. grab dredgers for bottom levelling, should not be excluded. When discharging dredged material on a dumping site, the position of the dump barge should be controlled by navigational or other devices that determine the vessel's position to ensure that the discharge is in the correct location. Besides, underwater currents and the speed of the vessel's movement should be taken into account when discharging the dredged material into the spillway, so that the suspended solids generated during the discharge are formed in the spillway area.

The results of testing the purity of sediments in the area of the port of Gdańsk (www.portgdansk.pl/o-porcie/badania-osadow) and in the vicinity of the operating Terminal and the planned investment (testing of core samples conducted as part of the planned modernization of the approach fairway to Port Północny, Chapter VI "The purity of seabed sediments to be dredged" in the Report on the environmental impact of the project named "Extension of the approach fairway with increase of its width and technical depth together with construction of a 750 m diameter turning basin", Transprojekt Gdański Sp. z o.o., Gdańsk, May 2015) allow to assume that the dredged material coming from the area of required dredging works will not be contaminated.

Depending on the lithology and purity of seabed sediments, a suitable option of dredged material storage will be selected, either at the marine dumping ground indicated by the Maritime Office in Gdynia or for filling the space subject to flooding within the planned project. The permit for disposal of dredged material at sea is issued by the Director of the Maritime Office, in accordance with the requirements of the Regulation of the Minister of Transport and Construction of 26 January 2006 on the procedure for issuing permits for the disposal of dredged material at sea and for dumping waste or other substances at sea (Dz. U. No. 22, Item 166). An application for the issuance of a permit for disposal of dredged material into the sea is submitted by the operator of a vessel loaded on the territory of Poland or of Polish nationality to the competent director of the maritime office, in whose area of operation the place of disposal of the dredged material and the place of dumping of sediments is located.

It is expected that the T 3 Container Terminal berth structure will be constructed similarly to the existing T 1 and T 2 terminal quays. This means that the quay will be in the form of an anchored seaward sheet piling, while the space of the T 3 terminal area will be filled with recycled material and sand, gravel, sand gravel or other aggregate or material of appropriate granulation and strength and reinforced accordingly. The support slab of the quay will be founded on vertical piles and diagonal piles or other means to provide stability to the wharf. As a result of scientific and technological progress, it cannot be ruled out that, depending on the results of geological research of the subsoil and other factors, the contractor will propose a different way of constructing the terminal - such other ways should be allowed e.g. with respect to construction and reinforcement of the quay and the terminal area (sample solutions are shown in **Appendix 2-1**), but the solutions adopted should ensure at least the same level of environmental protection as is ensured by the solutions described in this report, which will be demonstrated in the documentation related to the construction project. It cannot be excluded that the contractor will propose solutions meeting the technical requirements, which will use other technical solutions than those included in the above description - ultimately, however, as a result of construction activities, a terminal will be created in the location strictly specified in this report, but only made with the use of a different technology than the one described in this report, while this technology must be approved for use and cannot burden the environment more than those described in this report.

The construction process will include:

- preparatory work, which consists of:
  - geodetic work,
  - dredging within port waters,
  - development and organization of construction backup facilities,
- performing sheet pile wall protection areas,
- reefing works and land leveling,
- construction of underground infrastructure, e.g. drainage facilities, foundations,
- performing the next phase of work and preparing the site for paving (including piling),
- execution of concrete pavement layers which are elements of the pavement structure, consisting of importing, placing and compacting the concrete mass,
- installation of auxiliary equipment such as lighting, communications, automation, safety devices,
- installation of Terminal equipment, e.g. overhead cranes.

During construction, vehicular and rail traffic to the existing DCT Terminal will be maintained at all times; however, periodic disruptions to users of facilities located within the project area should be expected.

The works related to the construction of Terminal T 3 will be carried out in accordance with the obtained administrative decisions and arrangements, also on the part of contractors. Trained staff with specialized equipment and facilities will be hired. Procedures will be developed and must be strictly followed while the work is being conducted.

Back-up facilities will be prepared to store equipment and materials for construction work and to periodically store waste generated.

It is assumed and included in this assessment that the characteristic technical parameters may change, in particular such as the length of the quays of terminal T 3, the area of the individual functional units, the depth of the units allowed at the berth, as well as ambivalent parameters from the point of view of assessing the impacts caused by the construction and operation of T 3, such as e.g. these parameters were adopted on the basis of the investor's concept only to illustrate the nature of the project or to estimate certain quantities for the purpose of assessing the balance of materials, raw materials and fuels, such as e.g. the amount of fuel burned during the operation of the terminal or the amount of earth mass moved in connection with the construction of the project, up to 20%.

3 Undertakings in the area of the planned investment

In accordance with the content of Article 66.1.3.b of the Act on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessments, in the wording in force since 1 January 2017, the report on the impact of the planned project on the environment should contain information on the connections with other projects, in particular on the accumulation of impacts of projects implemented, completed or planned, for which the decision on environmental conditions was issued, located in the area where the project is planned to be implemented and in the area of impact of the project or whose impacts fall within the area of impact of the planned project - to the extent to which their impacts can lead to the accumulation of impacts with the planned project.

Following the applications for making available the data on decisions on environmental conditions for the projects located within the boundaries of the seaport in Gdańsk, within the meaning of the Regulation of the Minister of Transport, Construction and Maritime Economy of 29 May 2012 on defining the boundary of the seaport in Gdańsk from the sea, roadstead and land (Dz. U. of 2012, item 650), issued between 2014 and 2017:

- The City Hall of Gdańsk has made **39 decisions** available,
- The Regional Directorate for Environmental Protection in Gdańsk has made **10 decisions** available.

Based on the analysis of the above mentioned decision, the following **should be considered** as **relevant from the point of view of the report for the planned terminal T3 at DCT Gdańsk, in the context of the above mentioned requirement of Art. 66 par. 1 item 3 letter b of the EIA Act**:

1) from among the decisions issued by the Mayor of the City of Gdańsk:
    - Decision of the President of the City of Gdańsk, WŚ-I.6220.II.93D.2013.AN.173164, dated 16.07.2014, on environmental conditions for the undertaking named "**Construction of the Pomeranian Logistics Centre (PCL) - II stage together with land development and technical infrastructure at ul. Kontenerowa in Gdańsk, Stogi district";**
2) among the decisions issued by the Regional Director for Environmental Protection in Gdańsk
    - Decision of the Regional Director of Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4221.8.2015.ER.AJA.9, dated 09.10.2015, on environmental conditions, stating that there is no need to conduct an environmental impact assessment for the project named "**Expansion of the Polnocne Quay at the Peninsular Breakwater**";
    - Decision of the Regional Director for Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4221.2.2013.ER.27, dated 14.06.2016 on the environmental conditions for the project named **"Extension of the approach fairway with increasing its width and technical depth together with the construction of a turning basin with a diameter of 750 m", within the modernization of the approach fairway to Port Północny, located in the marine waters of the Gulf of Gdańsk and within the limits of the seaport in Gdańsk;**

- Decision of the Regional Director of Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4221.30.2014.KSZ.18, dated 05.09.2016, on environmental conditions for the project named **"Protective breakwaters in Port Północny in Gdańsk"**;
- Decision of the Regional Director for Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4221.13.2015.AJA.11, dated 28.01.2016 on environmental conditions, stating that there is no need to carry out an environmental impact assessment for the undertaking entitled **"Reconstruction of the Northern Island Breakwater in Port Północny in Gdańsk"**;

and, in addition

- the decision of the Regional Director for Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4211.29.2013.AT.9, dated 28.03.2014, on environmental conditions for the project consisting in the **construction of the T2 terminal**.

See **Appendix 3-1** for a list of all decisions obtained.

All of the above decisions, in particular the characteristics of the projects specified therein and the conditions of project implementation, were taken into account in the process of assessing the impact of the planned T3 terminal.

The possibility of cumulative impacts, their characteristics and associated recommendations have been included in the chapters of the Report which analyse the impacts on particular elements of the environment and the subject and objectives of protection in protected areas, in particular the Natura 2000 areas.

A detailed analysis of the environmental decisions indicated above shows that the interest of the authorities involved in the environmental impact assessment procedure focused on issues concerning:

- **technology and timing of the works** within the project area, method and place of disposal of the dredged material and timing and form of transportation of the dredged material; [it is recommended that prior to the commencement of the dredging works, the seabed (material which will be transformed into dredged material) should be examined for lithology and contamination in order to ensure that the dredged material is directed to a suitable disposal site; it is recommended that the dredging equipment (dredgers, hopper barges) should move slowly and at a speed of approx. 1 knot];
- the impact of **disturbing birds and reducing the area of their feeding grounds in the area of the project** , with particular attention to species protected in Natura 2000 area - Zatoka Pucka (Puck Bay); [it is recommended to adjust the timing of works to the periods characteristic for animal species identified in the area of the planned project; it is also recommended to conduct ornithological surveillance on sections of beaches, if they will be used for disposal of dredged material and if it will take place between April 15 and August 31; in the case of T3 the impact on the area of mitigation actions carried out in relation to the construction of T2 terminal will be an important issue]
- impacts related to the **handling of dredged material with particular attention to the impact on natural formations located within the impact range of the project**; [it is excluded that the dredged material may be deposited in certain protected areas;

appropriate periods during which different forms of dredged material may be deposited in specific locations are recommended];

- **impacts associated with increased turbidity and decreased transparency of waters during the execution phase of the project on ichthyofauna and lampreys, including spawning migration**; [of relevance here are the already mentioned recommendations concerning the method of dredging and timing of works to the periods characteristic of particular life processes of these organisms, as well as maximum reduction of the duration of hydrotechnical / dredging works];
- **the impact of the project on the ecological status of the waters in the Gulf of Gdańsk -** with reference to the findings of the Water Management Plans; [apart from the issues concerning the method of dredging, the recommendations concerning the prevention of and response to emergency situations, including various types of spills, are relevant here];
- **impact on the integrity of the Natura 2000 area - Zatoka Pucka and the coherence of the Natura 2000 network**;
- **impact of the project on possible historical monuments located on the seabed of the Gulf of Gdańsk in the investment site and its vicinity.**

All of the above aspects related to the impacts of the aforementioned projects have been analysed in conjunction with the impacts caused by the planned T3 terminal.

4 Options of the planned project

4.1 Location options

4.1.1 Determinants of the location options for the expansion of the DCT terminal

The document describing the directions of the spatial development of DCT so far is the final environmental decision for terminal T 2 (decision of the Regional Director of Environmental Protection in Gdańsk, RDOŚ-Gd-WOO.4211.29.2013.AT.9 dated 28.03.2014). This decision refers to the EIA report for Terminal T 2, which identified three alternatives for the possible construction of a terminal in Port Północny:

- alternative A - involving construction of the planned Terminal T 2 on the west side of the then existing Terminal T 1;
- option B (B1 + B2) - to widen and extend the existing T 1 pier within the harbour waters;
- option C - involving the construction of a new wharf parallel to the shoreline on the east side of Pier T 1.

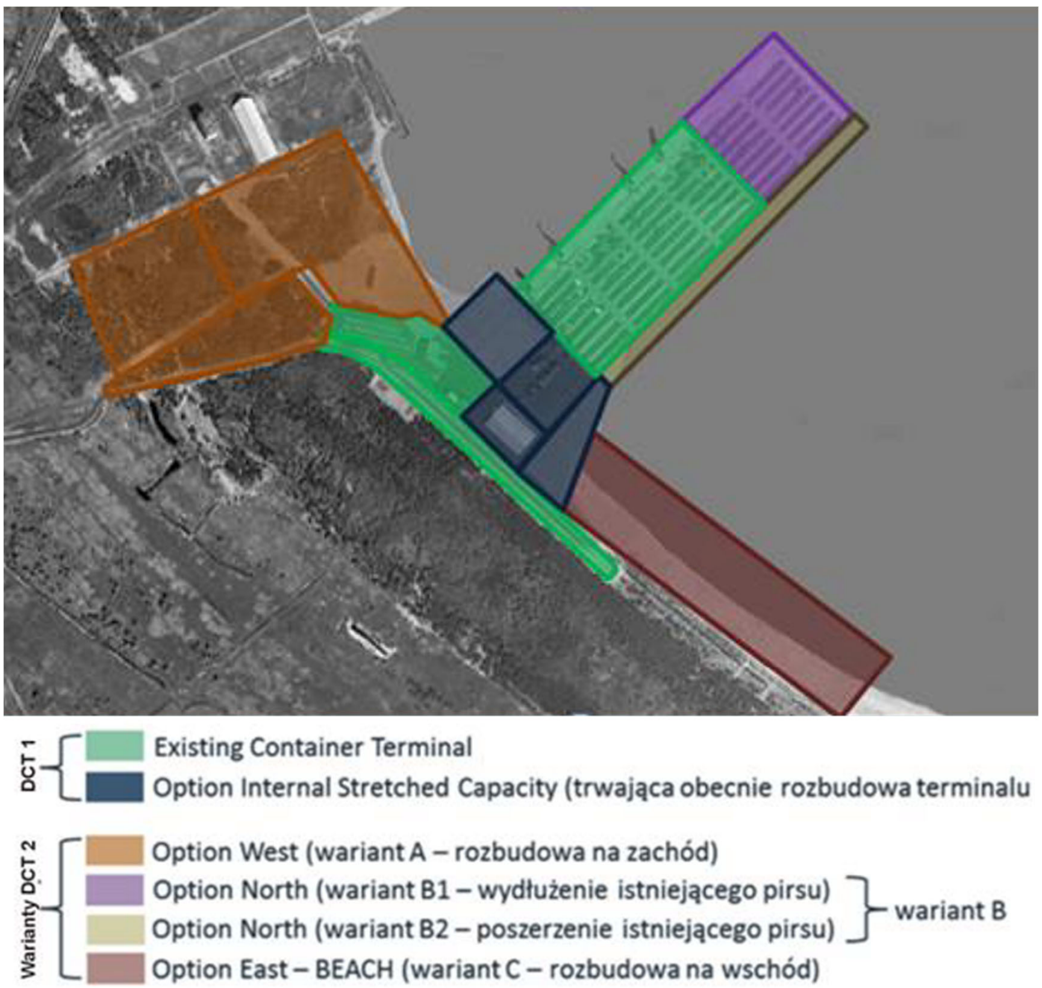

Figure 28 DCT expansion options in the T2 terminal EIA report
(Source: T2 EIA report)

The choice of option A for the construction of terminal T2 means that options B or C, or their mutations, may now be considered as DCT development scenarios.

These options were presented in the documentation for the preparation of the implementation of the T 2 terminal and the administrative decisions pertaining to it as technically unfeasible.

"The report shows that the considered location options for Terminal T 2 east of the existing DCT terminal are not technically feasible, due to the fact that the eastern part of the DCT pier is not protected by a breakwater this currently makes it impossible to extend the pier out to sea and extend the pier eastwards (Option B), or to construct a harbour pier in the part of the coast to the southeast of the existing terminal (Option C). Other solutions that could be considered as alternatives cannot be planned at the moment, as there are no technical conditions to introduce ships to the east of the current DCT terminal location. Only the possible construction of a new fairway or the modernization of the existing approach fairway to the port and the construction of a system of breakwaters could open the way to real consideration of using the areas east of the currently operating terminal for DCT purposes." (environmental decision for T2 terminal)

In the wave analysis documents for the "Port Północny - modernization of the approach fairway and island breakwater" project (2009), the DCT development scenario is spatially larger than the aforementioned Option B and includes an eastward expansion of the DCT on a larger scale.

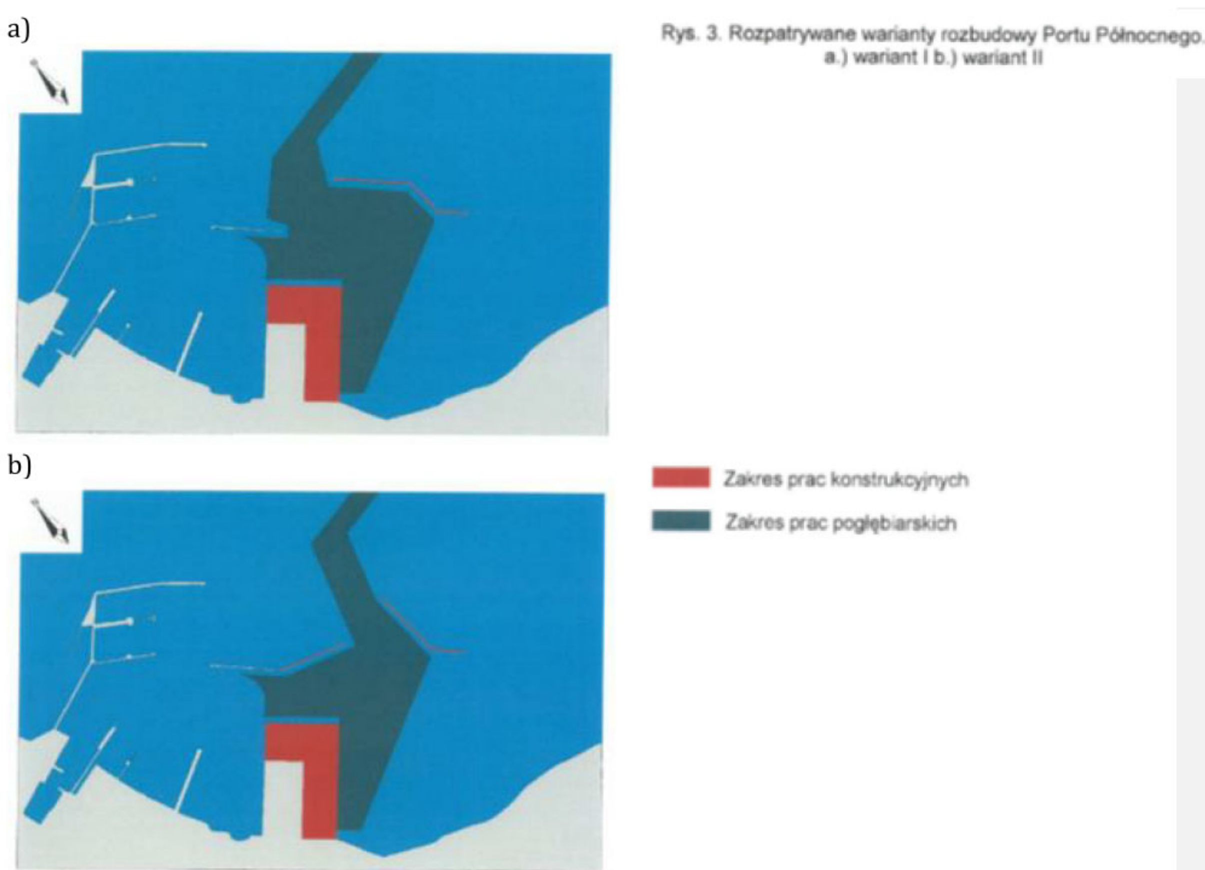

Figure 29: DCT expansion area in wave analysis
Source: Wuprohyd, 2009

The above direction is reflected and confirmed in:

- project documentation: "**Extension of the approach fairway with increase of its width and technical depth together with construction of a turning basin with a diameter of 750 m**" (EIA Report, Transprojekt Gdański, 2015) and the environmental decision concerning it (decision of RDOŚ in Gdańsk marked RDOŚ-Gd-WOO.4211.2.2013.ER.27 dated 14.06.2016);
- project documentation: "**Protective breakwaters in Port Północny in Gdańsk**" (EIA Report, ECG Orbital, 2015) and the environmental decision concerning it (decision of RDOŚ in Gdańsk marked RDOŚ-Gd-WOO.4211.30.2014.KSZ.18 dated 05.09.2016);
- Construction design of the approach fairway to Port Północny together with the analyses within the scope of the task Port Północny - Modernization of the approach fairway and island breakwater, aut. Wuprohyd, November 2009.

The latter project plays a leading role in the technical feasibility of extending the DCT terminal to the east. Specified in the documentation for this project, Option IIA (see below) is the developer's proposed alternative and is currently covered by the building permit.

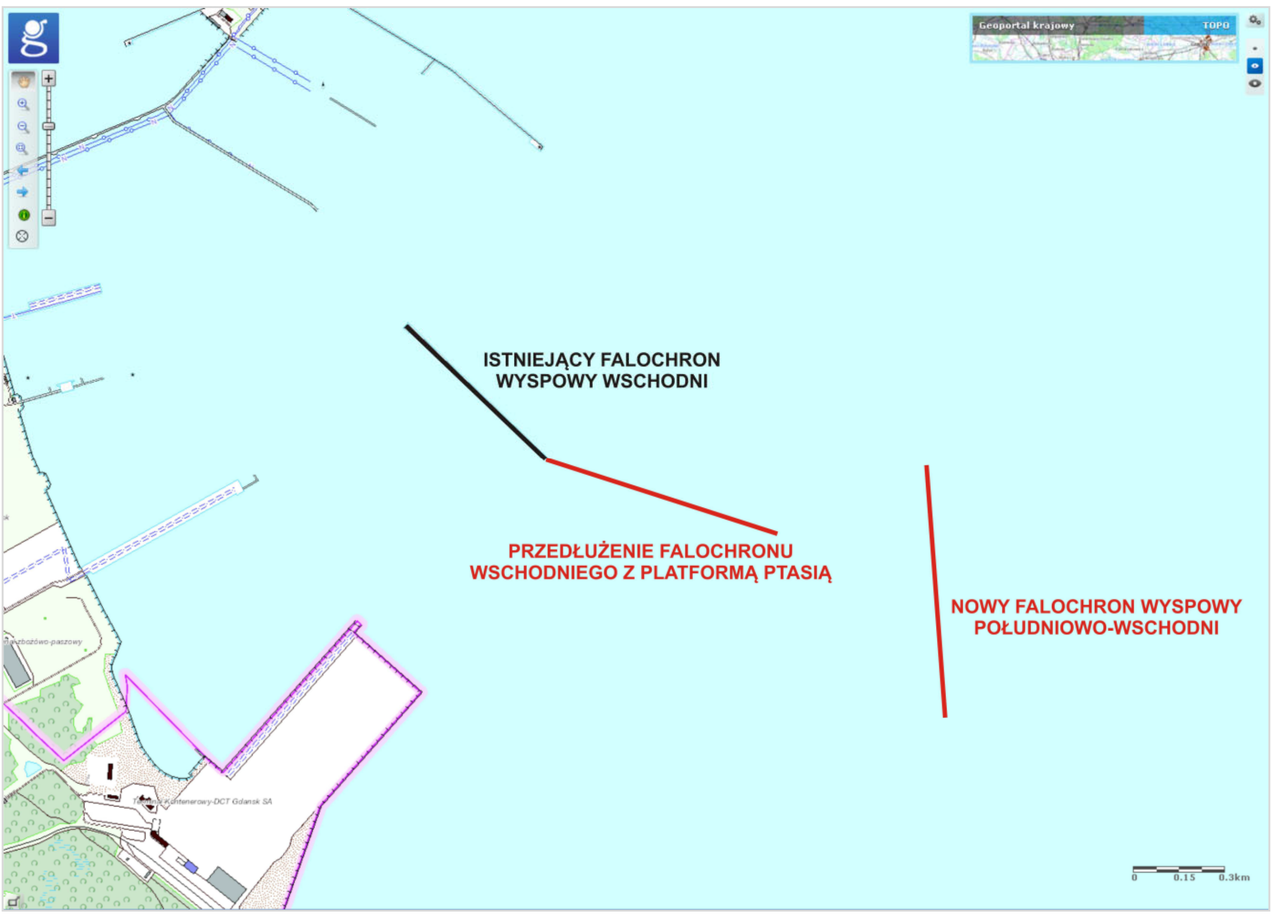

Figure 30: Option IIA (investor's option) of the construction of breakwaters
Source: Orbital 2015

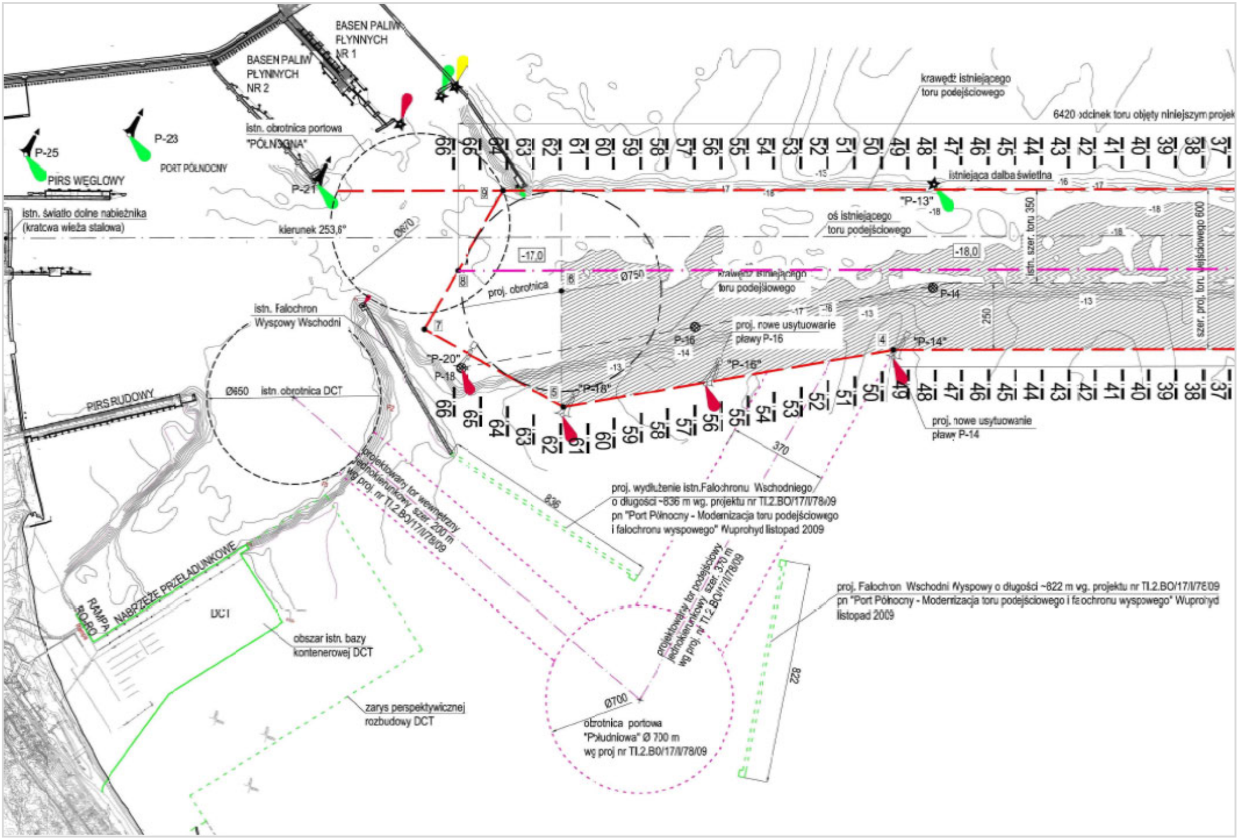

Figure 31: Location plan of the planned approach fairway to Port Północny (fragment)
Source: Wuprohyd 2010

The "outline of the prospective expansion of DCT" shown in the above-mentioned site plan coincides with the area currently being analysed by DCT S.A.

The described directions of development of port access infrastructure determining the possibilities of expanding DCT are reflected in the development strategy of the Port of Gdańsk.

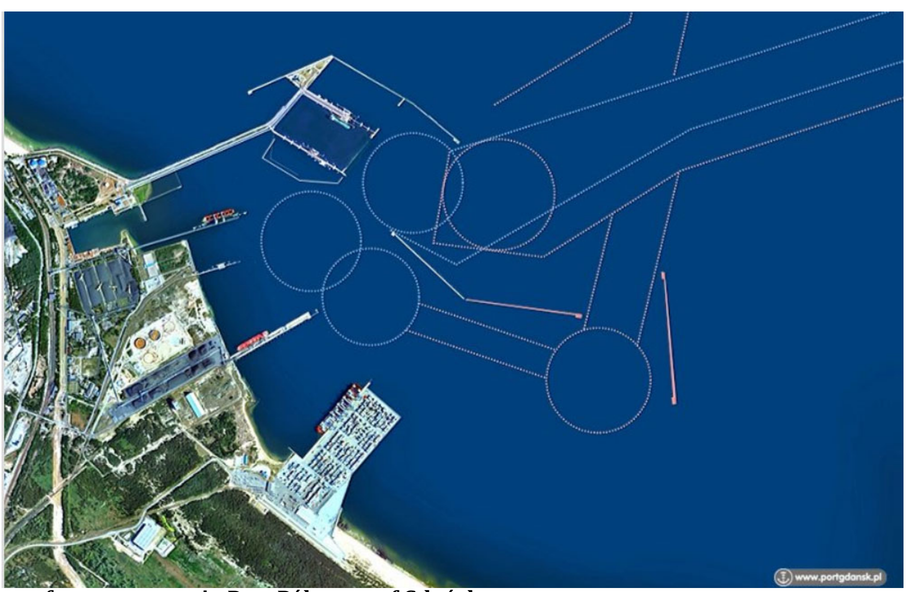

Figure 32: Scheme of new ventures in Port Północny of Gdańsk
Widening of the existing approach fairway to Port Północny, new breakwaters, new waterway to Port Północny, new turning basins and new approach fairway to Port Północny
Source : www.portgdansk.pl

4.1.2 Main determinants of location choice T 3

The competition of potential T 3 terminal location alternatives boils down to a choice between options:

- T 3 Implementation option in the eastern direction at the coastline ("Beach") and
- options of the extension of the T 1 quay to the north ("North") and/or east (along the eastern T 1 quay) only in sea waters, away from the shore or
- the option of a combined implementation of T 3 as an extension and expansion of the T 1 terminal in marine waters and onshore.

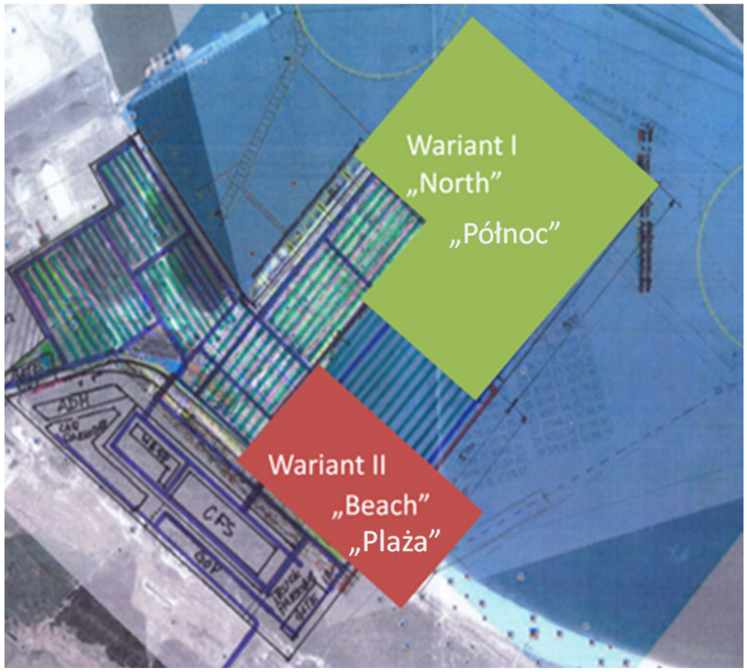

Figure 33: Scheme of searching for a location for the expansion of the DCT terminal
The figure comes from the early stages of the analysis of location alternatives - the schematic locations of the alternatives were not meant to reflect specific solutions that had not yet been analysed, but were meant to indicate the general directions of the spatial development of the DCT terminal.

The choice of the T 3 terminal location option in each of the above cases is determined, albeit to varying degrees, by:

1) location and technical characteristics of breakwaters that shape wave processes in the area of the potential location of the T 3 terminal,
2) potential possibility of significant impact of the planned T3 terminal on Natura 2000 areas (Puck Bay PLB 220005 area, Ostoja w ujściu Wisły PLH 220044 area) and potential conflicts of the investment with the execution of protection plans prepared for these areas,
3) land use arrangements resulting from the existing local spatial management plans and the function of the body of water and the related prohibitions and restrictions, proposed in the draft development plan for Polish maritime areas,
4) potential social conflicts that may arise in connection with the investor's option of implementation of the T3 terminal, in particular associated with felling trees or restrictions on the Stogi sea bathing site,
5) impact on water quality of the Stogi sea bathing site.

4.1.2.1 Ad 1) Shielding breakwaters

The technical characteristics of the eastern island breakwater after extension and the new south-eastern island breakwater are included in the appendix to the decision of RDOŚ in Gdańsk marked RDOŚ-Gd-WOO.4211.30.2014.KSZ.18 dated 05.09.2016 on the environmental conditions of the aforementioned project.

The underlying technical options for these breakwaters include protection of the fairway, turning basins and the area of the prospective DCT expansion.

4.1.2.2 Ad 2) Selection of alternatives in the context of environmental impacts, including Natura 2000 sites

Pursuant to Article 33(1) of the Act of 16 April 2004 on Nature Conservation (Dz.U. 2016, item 2134, as amended), it is prohibited, subject to Article 34, to undertake activities that may, separately or in combination with other activities, significantly adversly affect the objectives of protection of the Natura 2000 area, including in particular:

- deteriorate the condition of natural habitats or the habitats of plant and animal species for whose protection the Natura 2000 area was designated, or
- have a negative impact on species for the protection of which the Natura 2000 area was designated, or
- deteriorate the integrity of the Natura 2000 site or its links with other sites.

Consequently, "projects may be undertaken in the Natura 2000 area which , separately or in combination with other activities, do not have a significant negative impact on the conservation objectives set out in Art. 33 par. 1 of the Act of 16 April 2004 on Nature Conservation" [Judgment of the Supreme Administrative Court of 25 January 2011, II OSK 1300/10].

Article 34 of the aforementioned Act, which implements Article 6 (4) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Official Journal EC L 206, 22.07.1992, p. 7, as amended) and formulating the conditions for an exception to the aforementioned prohibition provides that

- if necessitated by imperative requirements of overriding public interest, including those of a social or economic nature,
- and there are no alternatives,

the locally competent regional director for environmental protection, and in maritime areas - the director of the competent maritime office, may authorize execution of a plan or activities which may have a significant negative impact on the protection objectives of the Natura 2000 area or areas included in the list referred to in Art. 27 par. 3 section 1,

- ensuring the implementation of nature compensation necessary to ensure the coherence and proper functioning of the Natura 2000 network.

In case of actions to be undertaken within the framework of planned projects, the permit referred to in Art. 34 par. 1 is replaced by the decision on environmental conditions (Art. 35a).

In addition, where significant adverse impacts affect priority habitats and species, a permit under Article 34 of the Nature Conservation Act may only be granted for:

- protection of human health and life;
- ensuring public safety;
- to achieve beneficial consequences of primary importance to the natural environment;
- resulting from the necessary requirements of overriding public interest, after having obtained the opinion of the European Commission.

The analysis of the existence of grounds for such a derogation is conducted in the process of the environmental impact assessment of a project (Article 33 (3) of the Nature Conservation Act, Article 6 (3) of Directive 92/43/EEC).

Similarly, according to Articles 66 and 67 of the Law of 20 July 2017 - Water Law, implementing Article 4(7) of the Water Framework Directive (2000/60/EC), *"[the following is allowed: 1) failure to achieve good ecological status or good ecological potential and failure to prevent deterioration in ecological status or ecological potential where this is the result of new changes in the physical characteristics of surface water bodies; (2) failure to prevent deterioration in the ecological status of surface water bodies from very good to good, or failure to prevent deterioration in ecological potential from maximum to good, where this is the result of new sustainable human activities necessary for the development of society." and "the failure to achieve good status and the failure to prevent deterioration in the status of groundwater bodies if it is the result of : 1) new changes in the physical characteristics of surface water bodies; 2) changes in the level of the groundwater table."* The above provision applies if the following conditions are all met:

1) All actions are taken to mitigate the effects of adverse impacts on the status of water bodies;

2) reasons for changes and measures are detailed in the river basin management plan and are updated every 6 years;

3) the reasons for the changes and actions are justified by an overriding public interest and the positive effects related to protecting health, maintaining safety, and sustainable development outweigh the public and environmental benefits related to achieving environmental objectives lost as a result of the changes and actions;

4) the anticipated benefits of the changes and actions cannot be achieved with other actions that are significantly more beneficial to the environmental interests, due to adverse technical feasibility or disproportionately high costs.

Both described regulations make an element of exception to the prohibition arising from these provisions "necessary reasons of overriding public interest" in the implementation of a project interfering in an unauthorized manner with protected goods. Such an imperative can therefore be analysed and assessed together in relation to both the interference with the Natura 2000 site and the risk of not achieving or maintaining good water status.

According to the guidelines of the European Commission on the above subject [[1] Management of NATURA 2000 sites. Provisions of Article 6 of the "Habitats" Directive 92/43/EEC; [2] Sustainable development and management of inland fairways in the context of the EU Birds and Habitats Directives; [3] Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC]:

- *"(...) where significant adverse effects on the integrity of the area are identified, major revision and/or withdrawal of the proposed plan or project should be considered. This is particularly appropriate where priority habitats and/or species protected under the Habitats Directive or globally threatened bird species listed in Appendix I of the Birds Directive are affected. Competent authorities must first analyse and demonstrate the need for the plan or project. Therefore, the null option should be considered at this stage."* [1]
- *"Then, the competent authorities should explore the possibility of alternatives that will better ensure the integrity of the area. All feasible alternatives should be analysed, in particular in terms of their effects on the conservation objectives of the Natura 2000 site, the integrity of the site and their contribution to the overall coherence of the Natura 2000 network. (...) the parameters used for this type of comparison relate to protecting and preserving the integrity of the site and its ecological functions. Therefore, other evaluation metrics, such as economic criteria, cannot be considered superior to environmental criteria at this stage."* [1]
- *"Article 6(4) requires the relevant authorities to ensure that the following conditions are observed before a decision is made whether or not to approve a project that may have a detrimental effect on the area: 1. The alternative presented for approval is the least harmful to the habitats, species, and integrity of the Natura 2000 site and there are no other viable alternatives that would not adversely affect the integrity of the site. (…)"* [2]
- *"... an authority may find that further alternatives exist even where the project or plan initiator has demonstrated that a specific range of alternatives has already been analysed at the design stage."* [3]

The jurisprudence further emphasizes that "[the lack of alternatives cannot be found after only a few alternatives have been tested, buy only after all alternatives have been ruled out." And that '[the lack of alternatives thus corresponds to the same stage of the proportionality assessment, in which, if there is a choice between several appropriate measures, the least onerous measure must be resorted to'. (Opinion of Advocate General Juliane Kokott of 27 April 2006 in Case C-239/04 Commission of the European Communities v Portuguese Republic; 'Castro Verde' case).

The preference of choosing the option should consequently concern the option which will not cause both significant and negative impact on Natura 2000 areas and will be the least intrusive in relation to those areas. **[see chap**. **8.6.7.1**]

The selection of the "Beach" option has a significant negative aspect in that such a selection implies the need to include in the perspective and scope of analysis the need to find an alternative site where mitigation activities for the T2 terminal could continue at the required quality. This issue may generally weigh on the evaluation of the Beach option, including its acceptability on wildlife grounds. **[see chap**. **8.6.7.2**]

A key consideration for the T3 marine terminal alternatives is whether they are likely to result in significant and adverse impacts on Natura 2000 sites. **[see chap**. **8.6.7.1**]

The justification of the need for the construction of terminal T3, motivated by the public interest and thus broader than the economic interest of DCT S.A., is also important in the above context. **[see chap**. **14**]

At the stage of analyses on selection of the option preferred by the Investor, there were reasonable grounds, having their source in the documents of the environmental impact assessments for the planned construction of the approach fairway and the sheltering breakwaters, for the statement that also construction of the T3 terminal, in the maritime variants interfering with areas of existence and gathering of protected avifauna and ichthyofauna species, will not cause a significant impact on Natura 2000 areas[14]. This thesis is supported by the conclusions of this Environmental Impact Report.

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[14] In the summaries of impacts caused by the planned construction of the fairway and breakwaters included in the EIA reports for these investments and the environmental decisions issued for them, no significant impacts on Natura 2000 areas are identified. The main impacts considered to be significant are construction phase noise, disturbance of bottom sediments and risk of collision with cultural heritage sites. According to the EIA report for the new approach fairway (Transprojekt Gdański, 2015), a significant impact was attributed only to the risk of collision with cultural heritage sites. The conclusions of the EIA report for the Shelter Breakwater Project (ECG Orbital, 2015) indicate that: "(...) the planned project will not have a negative impact on the subjects of protection of Natura 2000 areas. It will also not adversely affect the integrity of the areas described. Due to the characteristics of the planned project (no introduction of spatial barriers for birds), it will also not disturb the coherence of the Natura 2000 network of special bird protection areas."

4.1.2.3 Ad 3) Land use in planning documents

The area that may be considered for construction of the T3 terminal in the "Beach" option is covered by 3 valid local spatial development plans:

Plan 1312 Resolution No. VIII/162/15 of the City Council of Gdańsk of 26 March 2015 on adopting a local spatial development plan for Port Północny IV container terminal area in Gdańsk

Plan 1302 Resolution No. LI/1529/2002 of the Gdańsk City Council of 11 July 2002 on adopting a local spatial development plan for the PORT PÓŁNOCNY II in Gdańsk.

Plan 1416 Resolution No. XXXVII/1068/09 of the Gdańsk City Council dated 25 June 2009 on adopting a local spatial development plan for the area of the Stogi marine bathing site in Gdańsk.

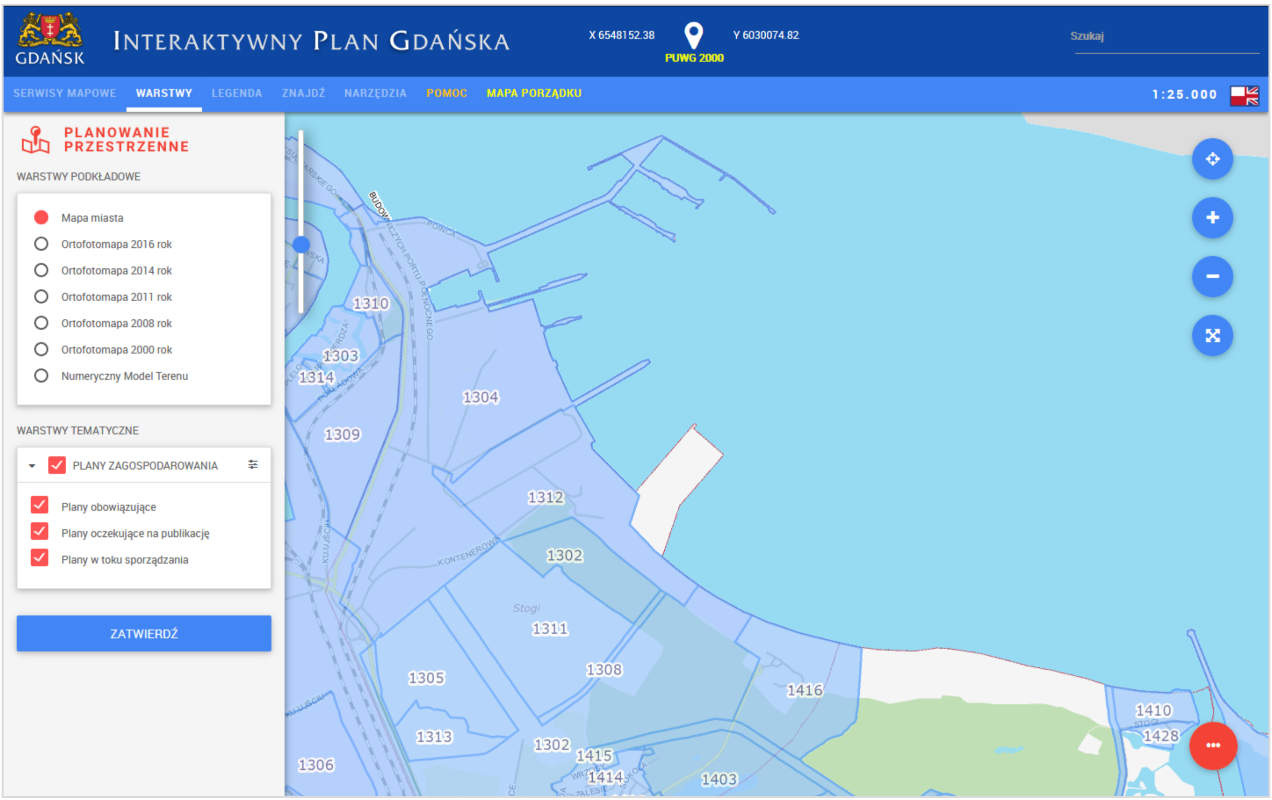

Figure 34 Spatial development plans in the DCT terminal area

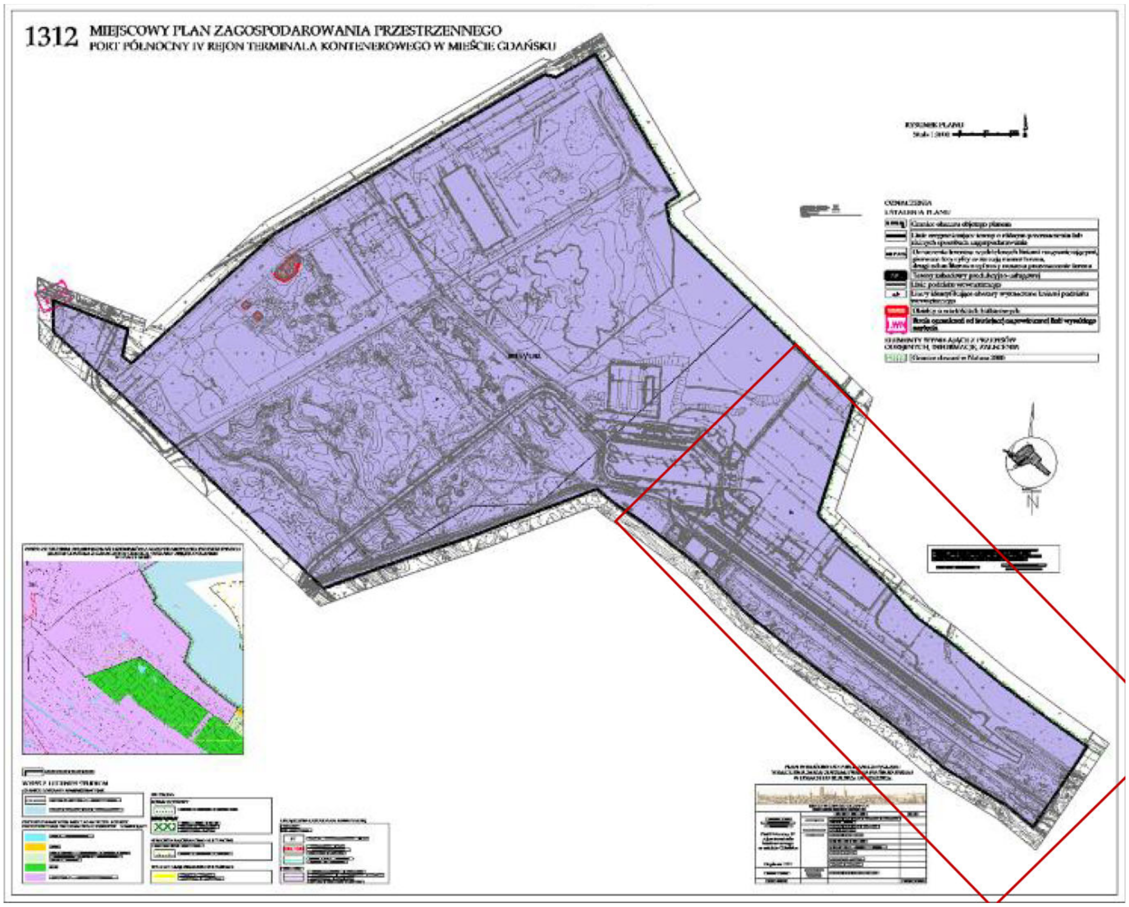

Figure 35 Figure of Plan 1312

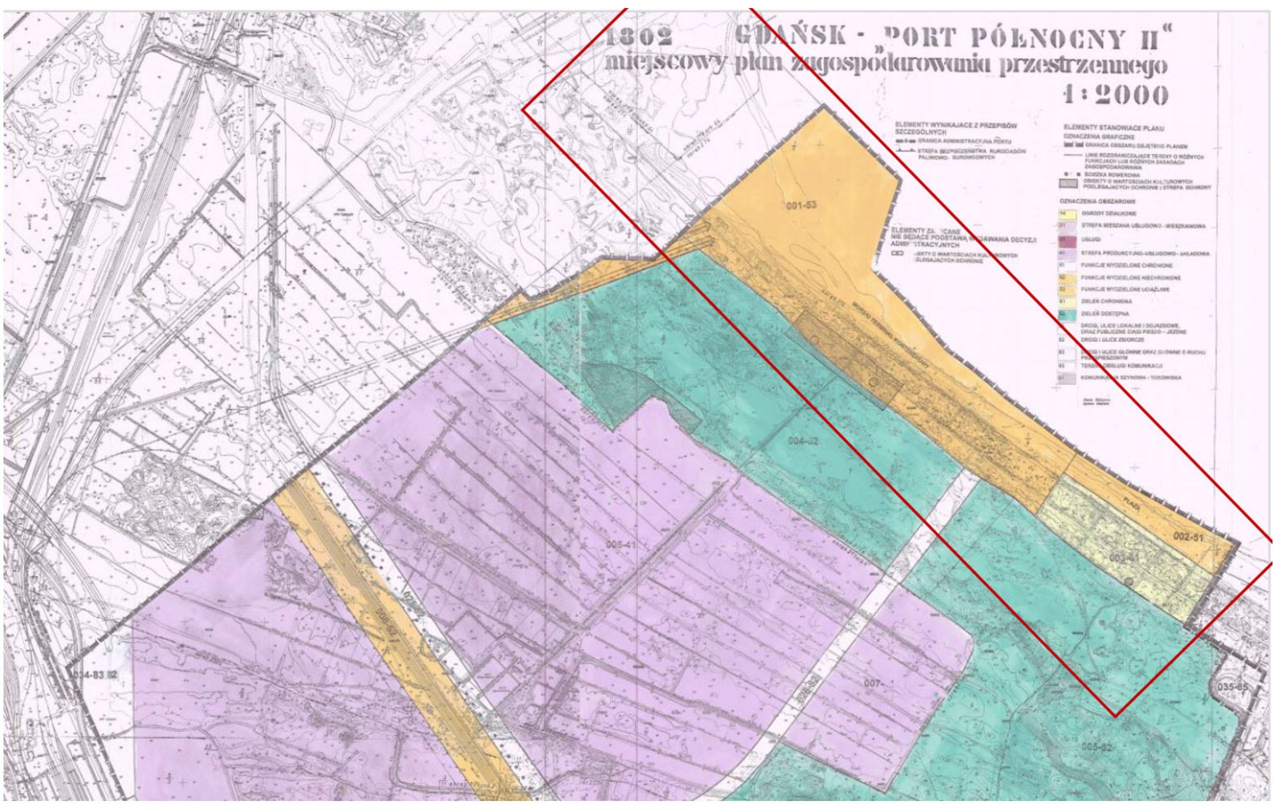

Figure 36 Figure of Plan 1302

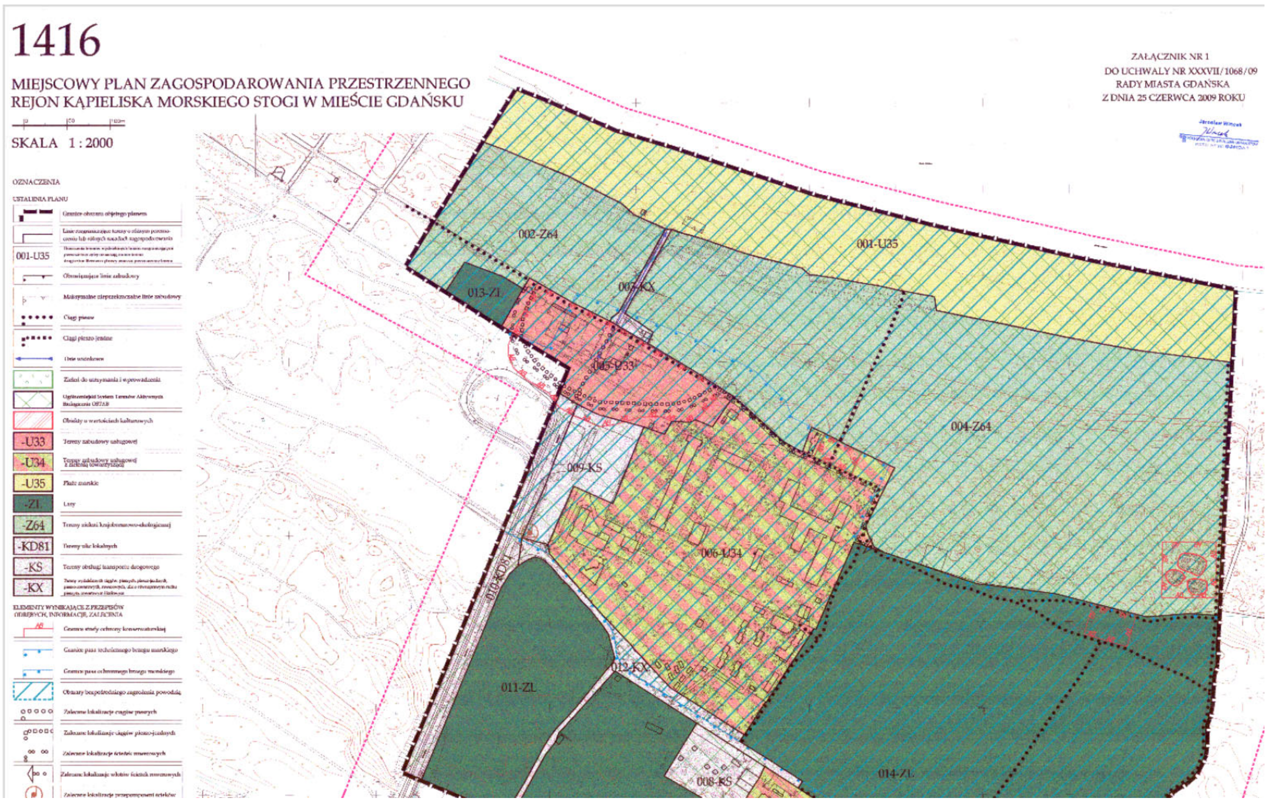

Figure 37 Figure of Plan 1416

In the 1312 plan area, essentially only a strip of existing railroad at the base of the T1 terminal is available for use by the T3 terminal.

<u>Plan 1302</u> provides for functions 53 and 51 in the shoreline strip.

53 - nuisance separated functions

(e.g., wastewater treatment plant, combined heat and power plant, airports, heliports, cemeteries, etc.), plus functional dominants within Zones 41 and 42.

41 - production, service and warehouse zone

This is a zone allowing for any commercial activity, provided that the given production and applied technologies prevent the emergence of hazards to the environment and life of the population even in case of an accident, except for: chemical, metallurgical and mining industries, industries requiring open-air storage of large quantities of loose materials, production with a significant scale of nuisance resulting from the volume of production, the amount of transport necessary for this production, traffic generation, pollution emissions and the amount of post-production waste.

Zone 33 plus gas stations, car repair shops, warehouses (except unbuilt bulk storage), wholesalers, small manufacturing plants, small manufacturing, electronics industry, electrical and mechanical equipment manufacturing (except manufacturing means and vehicles), passenger shipping ports, light manufacturing, food manufacturing (except large meat and fish processing plants), animal asylums, dog kennels, tram and bus depots, car and truck storage areas are permitted.

A residential function integrally related to the commercial activity shall be permitted.

51 - protected separated functions

functions listed by name, requiring protection from nuisance public utilities that are built by the municipality as part of its own or commissioned tasks (e.g. water intakes, hospitals, health resorts, etc.), and areas reserved for protected functional dominants by discretion (e.g. national museum, special cultural monuments, etc.),

These areas are surrounded by functional areas:

61 - protected greenery

greenery not accessible to the public (e.g. closed nature reserves, dunes, etc.), elements of linear technical infrastructure,

62 - available greenery

parks, forests, squares, green recreational areas, etc.

The following functions are allowed: tourist equipment and bicycle rentals, small catering facilities, toilets, tourist services, small architecture, trade and catering activities from facilities that do not require a building permit, such as sales from motor vehicles or portable stalls, set up only for the duration of the sale (permission of the owner or landowner required).

Plan 1412 provides for a U35 function in the strip adjacent to the shoreline and a ZL 64 function on its backside:

U35 sea beaches *with permissions for facilities related to tourist services.*

Z64 areas of landscape and ecological greenery: *e.g.: small natural water reservoirs and watercourses together with aquatic greenery, embankments, wetlands, common brooms, dunes, greenery on slopes, natural trees and bushes.*

As can be seen from the above, essentially only Site Function 53 (plus 41) is available for the T 3 Terminal under the Beach option. The sufficiency of this strip of land for the planned T 3 terminal needs to be analysed. It does not seem feasible or straightforward to obtain a change in forest land use on the backside of Function 53 lands.

The importance of the planning arrangements for the area planned for the construction of the T3 terminal is manifested primarily in the requirement for the compliance of the decision on environmental conditions with the provisions of the local spatial development plan.

In accordance with Article 80 (2) of the Act of 3 October 2008 on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessments: "*the competent authority shall issue a decision on environmental conditions after ascertaining the compliance of the location of the project with the provisions of the local spatial development plan, if such plan was adopted. This does not apply to the decision on environmental conditions issued for a public road, for a railroad line, for Euro 2012 projects, for projects requiring a concession for exploration and prospecting of mineral deposits, for terminal investments, for investments related to regional broadband networks, for flood control structures implemented pursuant to the Act of July 8, 2010 on special rules of preparation for the implementation of investments in the field of flood control structures, for investments in the construction of nuclear energy facilities or accompanying investments, for strategic investment in the field of transmission networks implemented under the Act of 24 July 2015 on the preparation and implementation of strategic investments in the field of transmission networks, and for investments in the field of access infrastructure implemented under the Act of 24 February 2017 on investments in the construction of a waterway connecting the Vistula Lagoon with the Gulf of Gdańsk.*"

Attention is also drawn to the potential high conservation value and protective functions of land potentially in the immediate vicinity of Terminal T 3.

Spatial development plans for Polish maritime areas at the scale 1:200 000 are currently in the initial phase of their preparation (first draft of the plan text and drawing ("v.1").

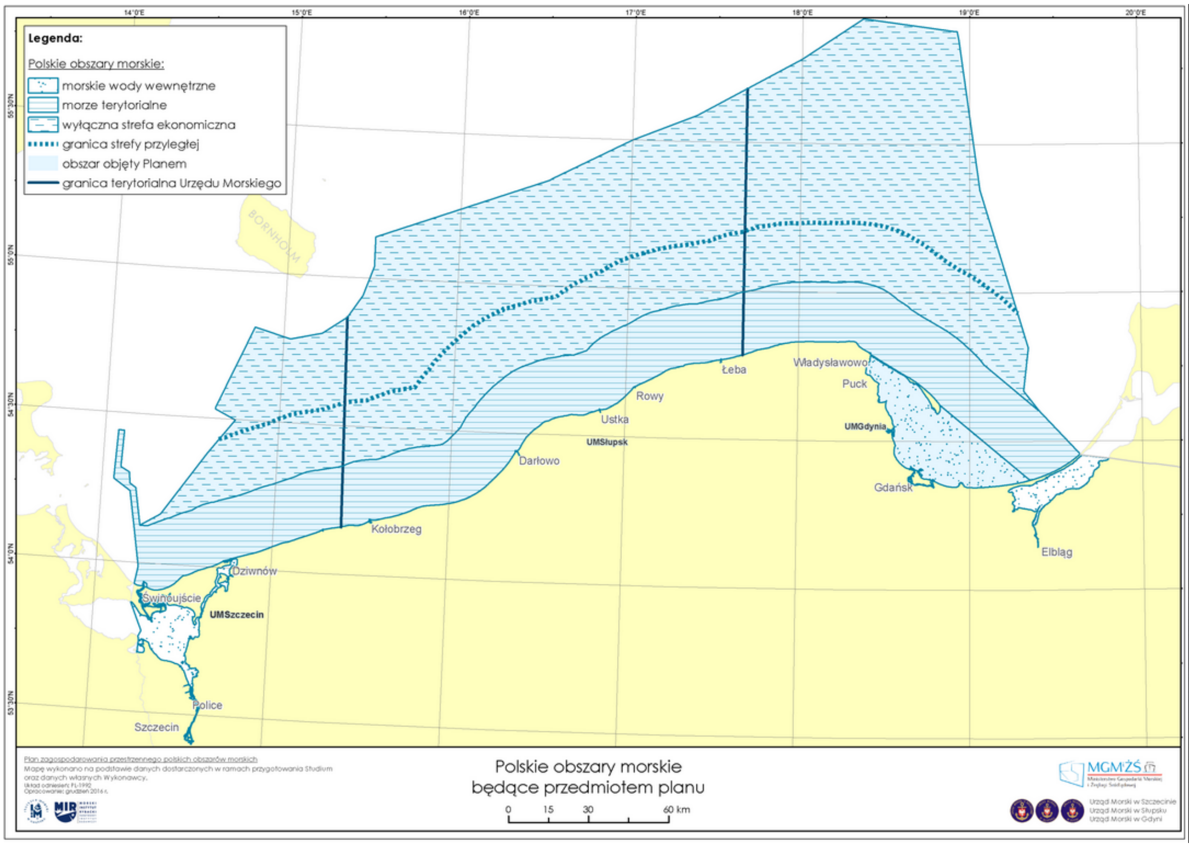

Figure 38 Polish maritime areas being the subject of the spatial development plan for Polish maritime areas in the scale 1:200 000
(Source: [www.umgdy.gov.pl)](http://www.umgdy.gov.pl)

"The draft plan is prepared by an interdisciplinary team of specialists from the Maritime Institute in Gdańsk in consortium with the Sea Fisheries Institute - National Research Institute, commissioned by the Director of the Maritime Office in Gdynia, acting also on behalf of the Directors of the Maritime Offices in Słupsk and Szczecin. The forecast is prepared by an expert team from the Maritime Institute in Gdańsk with the cooperation of specialists from DHI Polska Sp. z o.o., the University of Gdańsk, the Pomeranian Regional Planning Office and ARBOREA. The waters of ports defined in Art.4 item 4 of the Act on sea areas of the Republic of Poland and maritime administration of March 21, 1991 (...) and the waters of the Vistula Lagoon and the Szczecinski Lagoon are excluded from the scope of the plan" (http://www.umgdy.gov.pl/?p=15381)

Development of draft plans with forecasts for the port waters of Gdańsk and Gdynia is expected in the period from: 1 June 2017 to: 31 December 2021 (http://www.umgdy.gov.pl/?cat=298)

Lack of a spatial development plan for Polish maritime areas results in the fact that the permit for erecting or using artificial islands, installations and equipment in Polish maritime areas, which serves as a location decision for the T3 terminal in the maritime area, is issued by the minister in charge of the maritime economy ("for *projects planned, executed or exploited: a) in the area of internal maritime waters or territorial sea, if for those areas the plan, mentioned in Art. 37a par. 1, has not been adopted, and those projects require a building permit,*").

4.1.2.4 Ad 4-5) Social conflicts and Stogi sea bathing site

The T 2 terminal investment process revealed 2 areas of potential public conflict over the T 3 terminal location:

- associated with the logging of a forest stand,
- related to reducing the attractiveness of the Stogi sea bathing site, restrictions on movement on the beach strip, restrictions on development and functioning of the Stogi bathing site.

The full bathing water profile (a set of data and information concerning the physical, geographical and hydrological features of the bathing water and surface waters affecting its quality, together with the identification and assessment of causes of pollution that might affect bathing water quality and health of users) is available at: www.kapieliskagdansk.pl/plik,2230.html

4.1.3 Synthetic comparison of the environmental impacts of the analysed alternatives

The three location alternatives for the planned T3 Terminal discussed above were subjected to expert environmental analysis:

- Option I *("Beach")* - Implementation Option T 3 eastward at the shoreline,
- Option II *("North+")* - Option to extend the Terminal T 1 berth in a northerly ("North") and easterly direction (along the eastern T 1 berth) in marine waters only, away from shore,
- Option III - a combined option to implement T 3 as an extension and expansion of the T 1 offshore and onshore terminal.

The characteristics of the state of the environment and the impacts of the above mentioned alternatives are presented in individual chapters of this report, when discussing issues which resulted in exclusion criteria for any of the alternatives or criteria which caused the type or intensity of impacts to differ significantly from one option to another.

The table below compares the pair: option I and option II. Depending on the outcome of this comparison, possible further comparison activities incorporating Option III will be undertaken or the outcome of the comparison will be indicated. It was assumed that ultimately it would be sufficient to compare Option I with Option II, as Option III is the sum of Options I and II and the conclusions from the comparison of these options will be sufficient to assess Option III. The criteria listed in the Act, which were given weight due to the specificity of the site and impacts, were adopted for the comparative assessment. Weight was specified as an integer: 0, 1, 2 or 3, with a higher number indicating greater weight. Each criterion was then given a value for each of the options. The value was specified as an integer: 0, 1, 2, or 3, with 0 representing no impact and 3 representing the highest impact. It should be noted that "highest impact" in this case does not mean the absolute scale of the impact, but means a relative impact assessment - as part of comparing the impacts for the assessed alternatives, so a possible impact magnitude score of 3 does not mean that we are dealing with the highest possible impact under a given criterion, but with the highest among the assessed alternatives.

Table 4 Synthetic comparison of analysed options - relative impact of analysed factors

Options / **Impact on**	**Weight**	**Option 1** ***Beach***	Sub-score	**Option 2** ***North+***	Sub-score
people	**3**	**2**	**6**	**1**	**3**
plants	**2**	**2**	**4**	**1**	**2**
animals	**2**	**3**	**6**	**2**	**4**
mushrooms	**1**	**1**	**1**	**0**	**0**
natural habitats	**3**	**3**	**9**	**1**	**3**
water	**2**	**2**	**4**	**3**	**6**
air	**2**	**1**	**2**	**1**	**2**
surface	**2**	**1**	**2**	**0**	**0**
landscape	**2**	**3**	**6**	**2**	**4**
tangible goods	**1**	**3**	**3**	**2**	**2**
monuments and cultural landscape	**1**	**1**	**1**	**1**	**1**
forms of nature protection	**3**	**3**	**9**	**2**	**6**
interaction between elements	**3**	**3**	**9**	**2**	**6**
Total (score):			**62**		**39**

A sub-score (related to a criterion) is obtained by multiplying the criterion weight by a value that determines the relative magnitude of the impact. The final evaluation of the options is based on a comparison of the sum of the sub-scores. As can be seen in the table, the weighting of the criteria does not have a major bearing on the outcome of the assessment, as within each criterion it is only with respect to impacts on water that the expert assessment leads to the impact of Option II being given a higher value than that of Option I - due to the fact that a water body will be occupied, that it will be flooded and that dredging will take place in the vicinity of the sea bathing site. In all other cases, the sub-impact of Option II is rated as less than the impact of Option I.

The human impact of Option I has been assessed to be higher than that of Option II, because Location I is even closer to human habitation (housing, recreation) and obviously the nuisance associated with terminal operations (noise emissions, air emissions, landscape effect) will be more noticeable. It is also for this reason that the impact of Option I has been rated higher under the criterion of "interaction between elements", with additional arguments in favour of such a rating, such as the lack of land occupation under Option II, or the lack of interfering with mitigation measures, leading to interference in the areas designated by the criteria: animals, natural habitats, nature conservation forms.

The impact on plants of Option I was rated higher for the reason that Option II is not implemented on land at all, so the impact of Option I on plants, while not severe, would clearly be greater than the competing alternative. For the same reason, the relative impacts of the alternatives on fungi, or directly on the land surface, were similarly assessed.

Option I would have to involve the removal of site functions for mitigation activities resulting from Terminal T 2 that target birds, particularly the ringed plover. It would become necessary to develop and implement a concept that would provide the protection currently provided by DCT on the beach adjacent to Stogi Beach. Option II is implemented entirely in a water body and, as demonstrated, would not interfere with bird habitat in a manner that could be judged significant. Hence, the impact rating of Option II as better than Option I according to the criterion related to animal impacts. For the same reason (and in light of no other significant impacts identified for Option II), the same indication of differences in relative impact assessment was given to the alternatives with respect to criteria related to impacts on natural habitats and on conservation forms.

The impact of Option I on the landscape will be greater than that of Option II primarily due to the proximity of the port and its activities to human settlements and recreational areas, and for the same reason Option I has been assessed as less favourable under the criterion relating to material assets.

Instead, impacts to historic and cultural landscapes were considered comparable for both alternatives.

In doing so, and also taking into account the arguments presented in the previous sections (e.g. the issue of possible social conflicts), the environmental impact of Option II was clearly assessed to be significantly less than that of Option I, and it is clear that Option III will have a greater impact than any of the other alternatives, as it will involve the summation of the impacts of the two alternatives within a single alternative, while there is no economic need to expand the terminal to the size that would result from the combination of the two alternatives.

Therefore, from the point of view of environmental impact - among the considered feasible location options - **Option II** was considered to be **the most environmentally beneficial**.

Finally, it is worth noting that the comparison of the three possible alternatives is relative and relates to the extent of interference during construction and the primary impacts of the cumulative operation of the DCT as a whole - the impacts of each alternative have been estimated in comparison to the other alternatives.

4.1.4 Selection of the option preferred by the Investor

At an early stage of investment planning, the investor intends to harmonize its investment plans with environmental protection requirements and the assessment of other risks to the investment. Consequently, already at an early stage it considers as less preferable the options of project implementation, which are obviously associated with greater than others environmental impacts, with greater possibility of generating more serious social conflicts, etc.

In view of the above, the investor considers the solution related to the construction of T 3 on the beach **(rational alternative option**) to be less advantageous, and for further consideration accepts the marine options of the DCT development - both to the north and to the east **(option proposed for implementation**).

From the standpoint of the criteria described above, particularly given the degree of site reconnaissance, land use, and conflicting nature of the alternatives, the marine alternatives (offset from shore, no conflict with natural mitigation sites, low need for mitigation and no need for natural compensation, higher public acceptance) significantly outweigh the "Beach" alternative.

For the beach alternative, which is clearly associated with greater environmental impacts and has a greater potential to generate public conflict, there is an alternative (marine alternatives) and therefore only this alternative will be subject to further detailed analysis.

As shown in the forecasts of demand for reloading capacity of DCT (table below), already in 2021, deficits may appear in the potential of the terminal in relation to the market demand. Therefore, an alternative for T 3 cannot be the location in the Central Port planned by the Port of Gdańsk Authority SA, for which it is planned to obtain a building permit in 2022, the first phase of construction in the years 2022-2025, and the second phase in the years 2025-2027 (information after Economic Forum in TVP Gdańsk).

Table 5: Forecast of demand for cargo handling capacity in DCT

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Polish GDP forecast	4,2%	3,8%	3,6%	3,4%	3,2%	3,0%	2,8%	2,6%	2,6%	2,6%
Multiplier	2,5	2,5	2,5	2,5	2,5	2,3	2,3	2,3	2,3	2,3
Container volume growth rate	10,5%	9,5%	9,0%	8,5%	8,0%	6,9%	6,4%	6,0%	6,0%	6,0%
Polish container volume forecast										
DCT volume (68% share in market)	1 886 300	2 084 362	2 282 376	2 487 790	2 699 252	2 915 192	3 116 340	3 317 032	3 515 391	3 725 611
Other ports volume	855 044	944 824	1 034 582	1 127 694	1 223 548	1 321 432	1 412 611	1 503 583	1 593 497	1 688 788
Total volume	2 741 344	3 029 185	3 316 958	3 615 484	3 922 800	4 236 624	4 528 951	4 820 616	5 108 888	5 414 400
DCT 's optimal operational capacity (after completion of current development programs)	2 800 000	2 800 000	2 800 000	2 800 000	2 800 000	2 800 000	2 800 000	2 800 000	2 800 000	2 800 000
Gap between demand and supply with the view at securing current market DCT share	913 700	715 639	517 624	312 210	100 748	-115 192	-316 340	-517 032	-715 391	-925 611
	oversupply	oversupply	oversupply	oversupply	oversupply	undersupply	undersupply	undersupply	undersupply	undersupply

4.2 Crane power supply options

An overhead crane is an intermittent motion crane equipped with a lifting and lowering mechanism. It is designed to move containers vertically and horizontally in a space limited by the length of the travel path, the lifting and lowering height and the width of the bridge. Two options of the crane power supply method considered:

- power supply - option selected for implementation;
- power supply of the cranes through individual power generators.

The electric power supply consists of direct connection of the cranes to the electric power source, e.g. by means of a live cable or busbars (analogous to trolleybuses), while in option 2, the electric power source is an individual diesel-powered generator.

Two options of direct electrical supply to the cranes may also be considered: - at 0.4 kV or 15 kV, but are comparable from the standpoint of their environmental impact.

An electrically powered crane, in comparison with an overhead crane powered by a generator, is characterized by a lower noise emission from the device by about 15 dB and there is no fuel combustion process. Combustion of diesel fuel is associated with emissions to the air of such substances as nitrogen oxides, carbon monoxide and dioxide, sulphur dioxide, particulate matter (including particulate matter PM10 and PM2.5), and aliphatic and aromatic hydrocarbons in amounts depending on the intensity of use of the equipment.

The need to store diesel fuel at the terminal site and to build infrastructure in this respect (storage tank, distribution equipment, etc.), to transport it to the terminal site and the increased likelihood of accidental spills of petroleum substances (protection, however, is an efficient rainwater drainage system equipped with a separator) are also of significance.

Taking the above into account, it should be stated that the most environmentally beneficial option - electric power supply for the cranes - was selected for implementation.

4.3 Alternatives for dredging

documentation of projects planned for implementation in the immediate vicinity of DCT:

- "Extension of the approach fairway with the increase of its width and technical depth together with the construction of a turning basin with a diameter of 750 m":
- "Protective breakwaters in Port Północny in Gdańsk":

comprehensively addresses the issue of conducting dredging.

It should be recognized that the scope and scale of the analyses contained in these studies allow for the direct transfer and inclusion in the analysis of the DCT (T 3) terminal expansion of the conclusions and recommendations resulting from these studies with regard to dredging and spoil management techniques (with the exception of the part concerning supplying beaches, silting etc., because in the case of the expansion of the DCT terminal, the material excavated in the dredging process will either be suitable for inclusion in the flooded part of the basin and will be used there, or it will not be suitable for this purpose, and then - similarly to two of the above-mentioned projects - it will have to be moved to dumping sites; There are, of course, the possibilities of using the spoil in the waste management procedure).

Therefore, from among the various possible dredging techniques, the same dredging technique adopted for the two above-mentioned projects, i.e. the technique using backfilled suction dredgers with a scarifier, was considered to be the accepted dredging technique.

Further, based also on the conditions adopted for the aforementioned projects, it was assumed that the speed of the mechanical suction dredger with a scarifier will not exceed 1 knot during operation and that the same speed restriction should apply to the movement of the scarifiers during dumping of the spoil on the spillway, which will allow for an even distribution of the spoil on the seabed in the spillway area.

5 Findings of basic programming and planning documents

5.1 Programming and planning documents at the national level

"**The National Spatial Development Concept 2030**" was adopted by Resolution No. 239 of the Council of Ministers of 13 December 2011. (Dz.U. 2012.252) and is the most important national document on spatial development in the long-term perspective; it sets out the objectives and directions of the national spatial development policy, indicates the principles and mechanisms of coordination and implementation of development policies. The concept takes into account the findings of the TEN-T network of European transport corridors and national transport strategies.

Under Objective 3. "Improving the territorial accessibility of the country at different spatial scales through the development of transport and telecommunications infrastructure" main directions of activities have been defined; one of the key ones is to strive to minimize the external costs of transport. This will be done through technological and institutional change and investment. "*In freight, the modernization and construction of infrastructure to facilitate mainly intermodal (including intermodal centres and terminals) and bulk transport between metropolitan areas, border crossings, seaports, and other key economic centres will be supported. (...) in the field of sea* *navigation, investments serving to improve access to terminals of Polish sea ports of basic importance for the economy (Szczecin, Świnoujście, Gdańsk, Gdynia)...*".

Actions taken to implement the NSPCC 2030 are to take into account the reduction of external transport costs, including environmental costs, which is why the document supports intermodal systems, e.g. by creating a network of terminals for combined transport (large cities, freight border crossings, river and sea ports). "*An integrated spatial approach to the development of ports and port regions will ensure the improvement of accessibility of Polish ports from land and sea, as well as support their development integrated with a broader spectrum of regional and national economic processes.*"

"Creation of an integrated multimodal transport system - the integration of road, rail, air and shipping transport will be achieved by taking into account in the medium-term strategies the mutual complementarity of these modes of transport and, consequently, by taking into account the costs and benefits of the operation of different types of transport in a general development context and the development of intelligent transport systems. In terms of investments, priority will be given to creating favourable conditions for operators to build and expand handling and transfer terminals for various forms of transport (using modern technological solutions), to complete investments ensuring better accessibility of sea and river port terminals in land transport, and to integrate the airport network with the existing and planned network of road and rail connections in internal relations, in line with the EU common transport policy objective of creating a single European transport area".

The planned expansion of the DCT Container Terminal in Gdańsk is consistent with the findings of the long-term spatial policy for the development of the national transport system.

"**State Transport Policy for 2006-2025**" adopted by the Council of Ministers on 27 June 2005 includes the main directions of transport development; intermodal transport is one of them. The main reasons for the development of intermodal transport in Poland are: its location in the European transport corridors, development plans of the national economy and raising the living standards of the inhabitants; moreover, integration processes with the EU and other countries. Intermodal transport contributes to sustainable transport development by efficiently handling domestic and transit cargo, among other sea-land relations. According to the National Transport Policy "...*the development of intermodal transport will be facilitated by: (...) identification and implementation of priority projects for infrastructure development for intermodal transport in the long term, including the creation of a network of terminals and logistics centres, (...)".*

"**Strategy for the Development of Sea Ports until 2015**" adopted by the Resolution of the Council of Ministers of 13 November 2007 is a development of the National Development Strategy in the field of maritime economy; its aim is to "*improve the competitiveness of Polish sea ports and increase their contribution to the social and economic development of the country and increase the role of sea ports in the international transport network*", implemented through five priorities:

- Increase the competitiveness and innovation of the economy,
- Improving the state of technical and social infrastructure,
- Increase employment and improve the quality of employment,
- Building an integrated social and safety community,
- Regional development and enhancing territorial cohesion.

Draft resolution of the Council of Ministers on the adoption of the Programme for the Development of Polish Sea Ports until 2020 (with an outlook to 2030) is under preparation, which is the responsibility of the Ministry of Maritime Affairs and Inland Navigation. The following are cited as reasons and needs for the solutions planned in the project:

"Program for the development of Polish seaports until 2020 (with an outlook to 2030), hereinafter referred to as the "Programme", will be a document of operational and implementation nature, implementing the objectives contained in the National Development Strategy 2020. Active Society, Competitive Economy, Efficient State and in the Transport Development Strategy to 2020 (with an outlook to 2030) with respect to seaport development issues, in accordance with the Act of December 6, 2006 on the principles of development policy (Dz. U. of 2014, Item 1649, as amended) and the Plan for Orderly Development Strategy. The Program will also provide a framework for financing infrastructure investments in Polish seaports and sea and land access to seaports in the new financial perspective 2014-2020." *(source: MGMiŻŚ)*

The essence of the solutions included in the project is characterized as follows {own emphasis}:

"The program covers four seaports of primary importance to the national economy and other seaports and harbours that are important growth poles for their regional and local environment. The territorial scope of the Program is determined by Pomorskie, Zachodniopomorskie and Warmińsko-Mazurskie Voivodeships. From the point of view of the objective of the Programme, i.e. improvement of the <u>competitiveness of Polish seaports and their contribution to the social and economic development of the country</u> as well as <u>enhancement of the role of seaports in the international transport network</u>, the spatial and objective scope of the Programme includes also <u>infrastructure of access to seaports from the sea</u> and from the land (development of land corridors: road and rail and some river routes ensuring better transport accessibility to seaports). The objectives of the Programme were formulated on the basis of a detailed diagnosis of the current state of economic activity in Polish sea ports as well as on the basis of the forecast of cargo and passenger handling in Polish sea ports until 2020 with a perspective until 2030. The main objective of the Programme is to improve the competitiveness of Polish seaports and increase their contribution to the socio-economic development of the country and to raise the rank of seaports in the international transport network. In order to specify and at the same time support the implementation of the main objective of the Programme, specific objectives were formulated, which are of both economic and non-economic nature, and they are as follows: <u>adapt the service offer of seaports to changing market needs and create a safe and environmentally friendly port system</u>. Specific objectives are assigned the resulting investment-type priorities, which include:

- <u>development of port infrastructure</u> and infrastructure providing access to ports from the sea,

- adapting the port infrastructure to the changing cargo structure and development of other economic functions,

- integration of ports with other participants of transport chains through the development of infrastructure for access to sea ports from the land side,

- ensuring the safety of port traffic participants,

- integrating environmental rigor into port operations.

In order to achieve the above, sources of financing for investment activities (both in ports themselves and in access to ports) were identified, as well as indicators of their implementation were assigned to the formulated objectives, and based on them, the expected effects of the implementation of the distinguished undertakings were determined, as well as the manner of their monitoring and evaluation." *(source: MGMiŻŚ)*

The planned expansion of the DCT Container Terminal in Gdańsk is consistent with the findings of the existing and planned strategic documents related to the development of Polish seaports. It also fits directly into the provisions of **Resolution No. 14/2016 of the Council of Ministers of 16 February 2016 on the adoption of the "Plan for Responsible Development,** the development and operationalization of which are contained in the **Strategy for Responsible Development until 2020 (with an outlook until 2030) adopted by the Council of Ministers on 14 February 2017.** Among the so-called pillars of the Plan, **reindustrialization** is mentioned, by which is meant supporting existing and developing new competitive advantages and specializations of the Polish economy. The Strategy directly includes a provision which lists the above-mentioned Programme for the Development of Polish Sea Ports by 2020 (with an outlook to 2030) among strategic projects in the field of transport, whose main objective is to improve the competitiveness of Polish sea ports and increase their contribution to the socio-economic development of the country and to raise the rank of sea ports in the international transport network.

5.2 Programming and planning documents at the regional level

"Pomorskie Voivodeship Development Strategy 2020", adopted by the Sejmik of Pomorskie Voivodeship by Resolution No. 458/XXII/12 of 24 September 2012, is the basic strategic document setting out the directions for the development of Pomorskie Voivodeship. "Strategy..." sets out four scenarios for the development of Pomorskie voivodeship presented below:

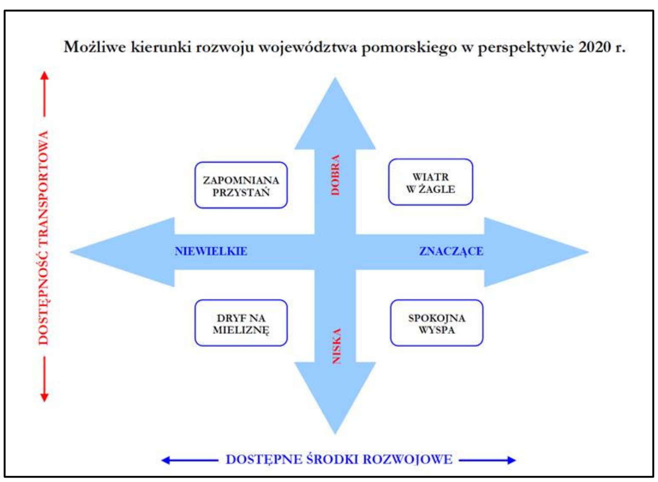

Figure 39 Development scenarios for Pomorskie Voivodeship [source: "Pomorskie Voivodeship Development Strategy 2020", 2012]

The strategy identifies three strategic goals: Modern Economy, Active Residents and Attractive Space; they are specific in 10 operational objectives and 35 lines of action. The Container Terminal DCT 2 project planned in Port Północny in Gdańsk contributes to the implementation of Operational Objective 3.1. An efficient transportation system.

"**Regional Strategy for Transport Development in Pomorskie Voivodeship for 2007 - 2020**" is an attachment to the Resolution of the Sejmik of Pomorskie Voivodeship No. 604/XXVI/08 dated September 29, 2008. This strategy is the basis for the formulation of transport development programs in the voivodeship. The planned construction of Container Terminal T 3, is in line with its strategic objective: "*The strategic objective of transport development in Pomorskie Voivodeship is to create a sustainable, integrated and environmentally friendly transport infrastructure system, ensuring good external accessibility and high quality of services, contributing to the improvement of living standards and conditions of the inhabitants, development of the economy and increasing investment attractiveness."*

The listed strategic objective is implemented through six sub-objectives. The planned project of construction of Container Terminal T 3 fulfills the tasks within the first objective titled: "The construction of Container Terminal T 3". "Improving transport accessibility", the investment fulfills the task of improving *accessibility from the sea, combined with increasing the safety of maritime transport and reducing threats to the environment, as well as modernizing and upgrading trunk railway lines and their connections with ports and introducing modern methods of cargo transportation (multimodal transport). An important role in achieving this goal will be played by the construction of port logistics and distribution centres in Gdańsk and Gdynia.*

The strategic objectives of the development of the Port of Gdańsk, in the context of the findings of the "Regional Transport Development Strategy..." are, among others:

- development of specialized reloading bases,
- effective use of the resources of the port-industrial complex in accordance with the interests of the national economy,
- development of distribution and logistics functions in connection with modern container and Ro-Ro terminals,
- developing modern reloading and storage potential,
- strengthening the restructuring processes of the port economy.

The planned construction of Container Terminal T 3 realizes the above mentioned strategic objectives of the development of the Port of Gdańsk, strengthening the position of the port in the South Baltic region. It also takes advantage of the development of transport and logistics-distribution links carried out as part of other transport projects in the city of Gdańsk and the Pomorskie region.

The currently outdated "**Pomorskie Voivodeship Spatial Development Plan**" was adopted by Resolution of the Sejmik of Pomorskie Voivodeship No. 1004/XXXIX/09 of 26 October 2009. The "Development Plan ..." defines the basic directions of spatial development of the region, including:

- "Shaping spatial conditions for economic development", where, among other things, the task is specified: "Strengthening and enriching traditional economic functions located by the sea and sustainable use of the potentials and space resources of the coastal area". The planned project is in line with the implementation of the following land use directions:
    - Shaping spatial conditions for the development of maritime economy and port-related sectors primarily based on improving external accessibility of sea ports of primary importance for the maritime economy - Gdańsk and Gdynia.

- Development of port logistics centres as intermodal hubs forming the Pomeranian Logistics Centre in the port areas of Gdańsk and Gdynia.

- Transport infrastructure, where the task "Increasing transport accessibility of the voivodeship on an international scale, especially in links with European Union countries and the metropolitan areas of the Baltic Sea Region" was specified.

The planned project is in line with the direction of spatial development aimed at improving accessibility to the voivodeship, where sea ports in Gdańsk and Gdynia with port terminals, adjusted to the conditions of motorways of the sea, have been identified as priority nodes in the transport network requiring expansion or reconstruction.

The current **Pomorskie Voivodeship Spatial Development Plan 2030** , currently in force, was adopted by Resolution No. 318/XXX/16 of the Pomorskie Voivodeship Assembly of 29 December 2016.

In the description of internal land use conditions (chap. 3), in subsection 3.5. Economic Sphere, it is indicated (paragraph 73) that: "Containerization and the growing intermodality of transport, as well as the development of the reloading potential and infrastructure facilities of the ports of Gdańsk and Gdynia, will strengthen their competitive position in the global market and increase demand for transport and logistics services throughout the region."

At the same time, it is emphasized that "The increase in container handling capacity, resulting from the implemented investments, will have a small impact on the improvement of the competitiveness of ports, as long as it is not accompanied by further investments both in ports and in the hinterland."

Regarding transport and infrastructure links (subchapter 3.8), the Pomorskie Voivodeship Spatial Development Plan indicates (paragraph 90) that: **"**Transport determinants of the voivodeship's development and its spatial planning result from both the interactions between the transport system and spatial planning (transport demand-supply relationship) and the financial and organizational possibilities of developing the transport system itself. The current state of the transport system and the directions of its development determined by 2020 are important determinants of the development of spatial development of the voivodeship after 2020, and transport infrastructure of national and international rank (national roads, railroads, airport, seaports) is of particular importance." In doing so, it points out (para. 91) that: "The external accessibility of the voivodeship, despite the construction of the A1 freeway on the Gdańsk - Łódź section and the modernization of railroad line No. 9 (Gdynia-Warsaw) is still below the national average, which affects the competitiveness and position of the region in the port, transport and logistics sector (...). In terms of improving accessibility, it is necessary to further improve road (construction of S6, S7 and S11) and rail (modernization of lines No. 131 and 202) links with other metropolises (Warsaw, Poznań, Wrocław, Szczecin) and to modernize access infrastructure to sea ports (including railroad line No. 201 Gdynia Port Bydgoszcz-Nowa Wieś Wielka)."

In the characterization of the "Water Subsystem, including Marine Subsystem" it is noticed (paragraph 106) that: "Between 2010 and 2014, cargo handling at the Port of Gdańsk and the Port of Gdynia increased from 41.9 to 51.7 million tons on an annual basis, while container handling increased from 0.99 to 2.06 million TEUs. Both ports rank second (after St. Petersburg) ranks on the Baltic Sea in terms of the number of containers handled. The port reloading forecasts are positive, especially for general cargo and containerized cargo. It is estimated that the container turnover of the Tri-City terminals in 2025 will be about 5 million TEU." Further, that (para 107): "Handling the projected port cargo will require improved capacity on the roads and rail lines serving the ports. Completed in 2016, the road tunnel under the Martwa Wisła river will improve access to the inland port at the Port of Gdańsk. It will be necessary (...), to modernize and expand rail lines on sections directly serving both ports and to consider using inland fairways to serve the ports. The key investments for maintaining the market position and increasing the competitive advantage of the ports will be the further development of their logistics facilities, i.e. the Pomeranian Logistics Centre in Port Północny, the container terminal DCT2 and the Logistics Centre in the western part of the Port of Gdynia, the Port of Gdańsk on newly flooded land."

In section 5.3 of the plan: „5.3. The "Vision and the corresponding model of functional and spatial structure of the voivodeship" indicates (point 15) that: "Tri-City seaports, despite the natural competition between them, form a Baltic transport and logistics hub, efficiently linked by the so-called 'last mile' infrastructure with the supra-regional road and rail system. Their extensive deep-water infrastructure and logistics facilities form the basis for the development of a regular network of ocean links with Far Eastern ports. The growth of container streams handled in the ports of Gdańsk and Gdynia is supported by the functioning dry port in Tczew, and further growth of reloadings and their degree of containerization gives grounds to think about building a new one in Koscierzyna."

The planned project consisting in the expansion of the DCT Terminal in Port Północny in Gdańsk (T 3) fully complies with these conditions.

For the above conditions, the provincial spatial development plan defines, among others, the objective "C.2. Competitive and Multifunctional Economic Space and Security". From the description and rationale of this objective, it appears that: "A significant problem of development and spatial management of the voivodeship is insufficient multifunctionality of the functional and spatial structure and its insufficient impact on the competitiveness of individual areas of the voivodeship. Numerous development barriers limit the possibilities of using internal potentials related to space resources (e.g. minerals, waters, forests, air or existing investments) as factors of regional and local economy development, e.g. in tourism, RES production, agri-food and forestry processing, etc. Overcoming these barriers is hindered by insufficiently developed transport infrastructure, both road and rail, which limits the supply of good investment areas, the flow of know-how and ideas, and inhibits the development of multifunctional structures - resistant to economic turbulence. In many places, the predispositions resulting from the advantage of coastal location, the proximity of transport and energy infrastructure are not fully used, which limits the opportunities for development and strengthening the position of the region in the port, transport and logistics sectors, as well as the formation of container and fuel and energy hubs and economic activity zones. Also natural conditions of development based on resources and values of the environment are not fully used for development of attractive tourist offer. The state of the energy security system, especially the decapitalization of transmission and distribution networks and the distribution of power plants in the central and southern parts of the country, is also a significant problem."

The realization of the aforementioned objective is to be served, inter alia, by the direction of the voivodeship spatial development policy defined in the plan 2.2: "Shaping spatial structures to create new and sustainable jobs."

As set forth in the plan in this regard:

POLITYKA PRZESTRZENNA WYZNACZONA W KIERUNKU 2.2. KONCENTRUJE SIĘ NA:

- Zwiększaniu potencjału gospodarczego i podnoszeniu atrakcyjności inwestycyjnej województwa
- Ukształtowaniu warunków przestrzennych rozwoju największego węzła transportowo-logistycznego w Regionie Morza Bałtyckiego
- Wzmacnianiu i rozwijajniu funkcji małych portów i przystani morskich
- Rozwijaniu infrastruktury sieci szerokopasmowej umożliwiającej rozwój usług cyfrowych

The land use principles that define how Direction 2.2 is implemented are as follows:

2.2.1. The principle of multifunctional shaping of economic space structures in a way that minimizes the occurrence of spatial conflicts. R

2.2.2. The principle of development of investment areas (for economic activities, including services):

1) utilizing primarily economically invested areas (brown field), including post-industrial, post-oil, post-military and post-state farm buildings; W "A"
2) in new locations (green field) only in case of exhaustion of the space resources that can be redeveloped (brown field), especially degraded areas, or in case of lack of areas with appropriate parameters and formal and legal conditions, while this investment must take into account the requirements of spatial order and result from a justified need 223; W "A"
3) in the direct range of influence of existing industrial complexes; W "A"
4) adequately connected with the road and railroad system; W "A"
5) having the capacity to be served by public transport; R
6) with sufficient area to allow for the designation of green buffer areas, minimizing the negative impact of these areas on adjacent areas (e.g. to reduce noise pollution).

The construction of Terminal T3 at DCT Gdańsk is part of Action 4, which aims to implement the above mentioned direction:

DZIAŁANIA I PRZEDSIĘWZIĘCIA POLITYKI PRZESTRZENNEJ, SŁUŻĄCE REALIZACJI KIERUNKU 2.2.:

L.p.	Działania i przedsięwzięcia	Podmioty odpowiedzialne za realizację	Ranga zapisów
4.	Rozwój portów morskich w Gdańsku i Gdyni jako stref aktywności gospodarczej, łączących w sobie funkcje industrialne z kompleksową obsługą transportu intermodalnego oraz centrami dystrybucji ładunków, poprzez m.in.: 1) wykorzystanie możliwości rozwoju portu w Gdańsku na leżących w granicach administracyjnych portu akwenach, przyległych od północnego-zachodu do istniejącej głębokowodnej infrastruktury portowej (np. planowany Port Westerplatte); 2) wykorzystanie możliwości rozwoju portu w Gdyni na obszarach okołoportowych (sąsiadujące z obszarem administrowanym przez ZMPG SA), m.in. tereny enklaw zlokalizowane w granicach administracyjnych Portu Gdynia, obszar Doliny Logistycznej (zachodnia część Portu Gdynia i jego sąsiedztwo) oraz obszar rozwoju terminali głębokowodnych na zalądowionych akwenach Zatoki Gdańskiej; 3) rozbudowę Pomorskiego Centrum Logistycznego w Gdańsku; 4) rozbudowę Centrum Logistycznego w Porcie Morskim w Gdyni.	zarządy portów morskich	W„A"

5.3 Spatial development plans of Polish maritime areas in the scale 1:200 000

Spatial development plans for Polish maritime areas at the scale of 1:200,000 currently remain in the initial phase of their preparation.

"The draft plan is prepared by an interdisciplinary team of specialists from the Maritime Institute in Gdańsk in consortium with the Sea Fisheries Institute - National Research Institute, commissioned by the Director of the Maritime Office in Gdynia, acting also on behalf of the Directors of the Maritime Offices in Słupsk and Szczecin. The forecast is prepared by an expert team from the Maritime Institute in Gdańsk with the cooperation of specialists from DHI Polska Sp. z o.o., the University of Gdańsk, the Pomeranian Regional Planning Office and ARBOREA.

The waters of ports defined in Art.4 item 4 of the Act on sea areas of the Republic of Poland and maritime administration of March 21, 1991 (...) and the waters of the Vistula Lagoon and the Szczecinski Lagoon are excluded from the scope of the plan" (http://www.umgdy.gov.pl/?p=15381)

Development of draft plans with forecasts for the port waters of Gdańsk and Gdynia is expected in the period from: 1 June 2017 to: 31 December 2021 (http://www.umgdy.gov.pl/?cat=298)

Lack of a spatial development plan for Polish maritime areas results in the fact that the permit for erecting or using artificial islands, installations and equipment in Polish maritime areas, which serves as a location decision for the T3 terminal in the maritime area, is issued by the minister in charge of the maritime economy ("for *projects planned, executed or exploited: a) in the area of* *internal maritime waters or territorial sea, if for those areas the plan, mentioned in Art. 37a par. 1, has not been adopted, and those projects require a building permit,*").

5.4 Programme and planning documents of the city of Gdańsk

The basic information related to the local spatial plans is discussed in the chapter "Alternatives of the planned project" - the planned project is located outside the onshore area, so it is not included in any of the local spatial plans, while the onshore hinterland is included in the plans, which take into account the harbour and therefore industrial-warehousing function of the land.

The Study of Conditions and Directions for Spatial Development of the City of Gdańsk, which was adopted by Resolution No. LI/1506/18 of the City Council of Gdańsk of 23 April 2018, was briefly considered in the chapter "Analysis of Possible Social Conflicts Associated with the Planned Project" due to protests by residents of the Stogi district regarding the inclusion of land areas east of Terminal T 1 in the port function. This conflict is not related to the Investor's intentions, as the planned project is entirely planned to be implemented in the sea area, within the boundaries of the Port of Gdańsk and is in line with the development directions presented in the Study, but does not encroach on land areas, in particular on the beach or forest areas.

6 Characteristics of the state of the environment

6.1 Location and terrain

The area of the planned project is located in the marine area, in the northern part of Stogi Island, adjacent to the administrative borders of the city of Gdańsk. The area includes anthropogenically transformed port area in the immediate vicinity of the existing T1 Marine Container Terminal (to the west), as well as the so far undeveloped sea basin extending to the east and north-east for about 500 m. The area is part of the port complex of Port Północny in Gdańsk, under the authority of the Port of Gdańsk Authority S.A.

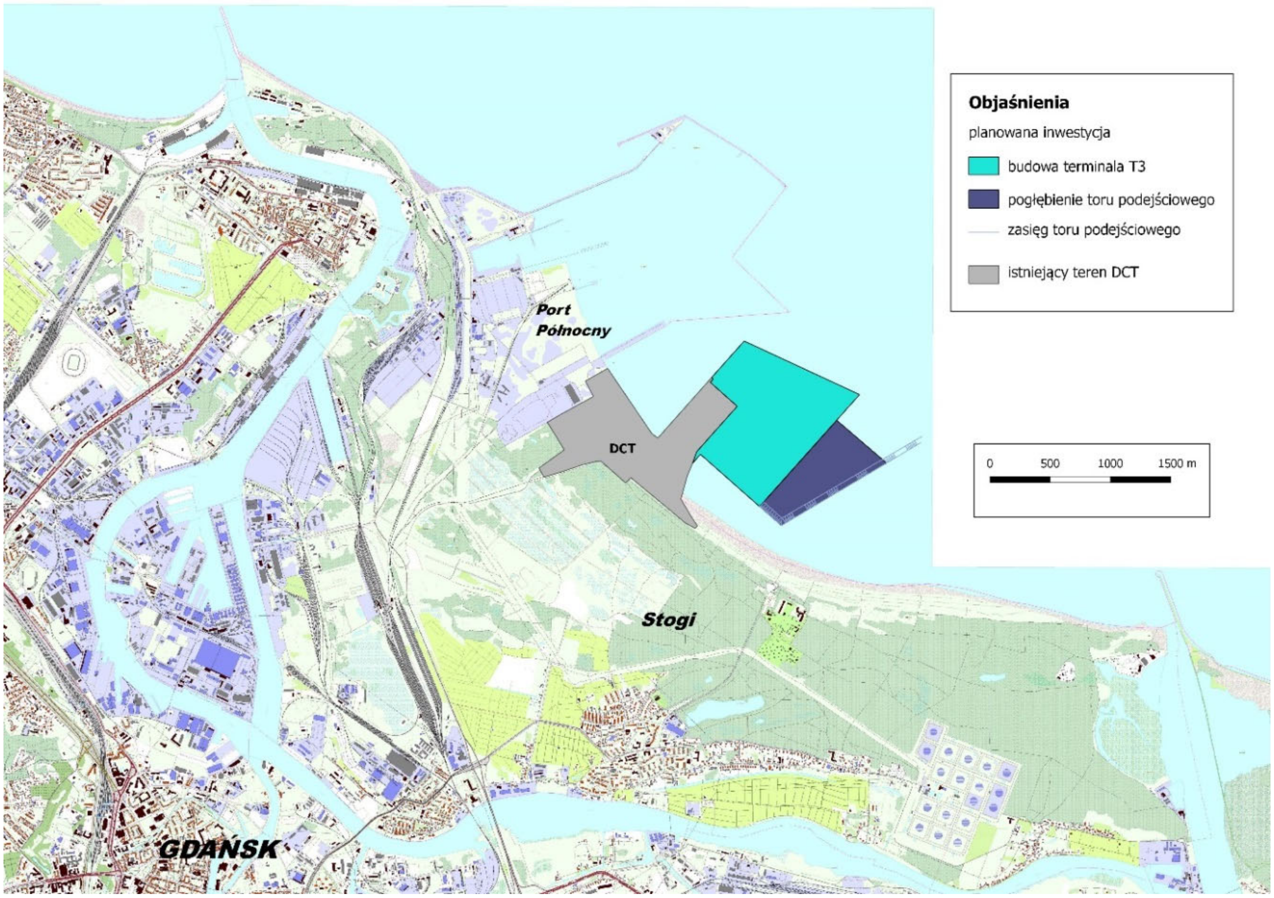

Figure 40: Location of the planned project

The Port Północny lies within the Gdańsk Bay. It is a body of water with natural bottom depths ranging from approximately 6 m in the area of the Bank Breakwater to approximately 10 m in the vicinity of the North Inner Breakwater. In recent years, dredging has taken place in the project area in the wharf area of Container Terminal T 1 and T 2. The area of the bay bottom in the area of the planned project has been partly transformed as a result of the above-mentioned dredging works, as well as it includes parts re-reactivated from sediments and sands from dredging of the basin and the fairway to Port Północny.

On the south and south-west side, the project area is directly adjacent to the existing terminal T 1, which is a completely anthropogenic, artificially created strip of port quay.

In the further surroundings of the planned investment - at a distance of at least 360 m - there is a natural shoreline and hinterland comprising the northern fragment of Stogi Island. Stogi Island is separated from Żuławy Wiślane by the Martwa Wisła riverbed. According to the physicogeographic regionalization (Kondracki, 2002), the island is located within the Vistula Spit mesoregion. It is a sandy dike enclosing the inner part of the Gulf of Gdańsk, formed by wave action and the drift of sands from coastal abrasion. The Vistula Spit is mostly covered with coastal dune communities as well as dune woods and forests.

The vast majority of the project area is occupied by the DCT infrastructure, including administrative and technological buildings, road and rail transport. Only at the height of the eastern part of the planned investment, in the land part, there are undeveloped areas, including the beach and the dune shaft with diversified relief and absolute heights up to 5 m above sea level, further south overgrown with forest. There are hollows between dunes, periodically or permanently filled with water. Some of them are remnants of illegal amber mining.

6.2 Geological structure and bottom sediments

6.2.1 Geological structure

The area is characterized by a geological structure, the formation of which was connected with the development of the Vistula delta and the morphogenetic influence of the Baltic Sea during the lithorhynic transgression and at present. The seabed in the area of the planned project is lined by Holocene age sediments, developed as a cover of sands, marine and lagoon silty sands and layers of sands and silts of the modern delta front.

Marine and lagoonal sands and silty sands occur directly at the planned project site in a relatively thin layer, about 1-3 m thick, reaching up to about 6 m in the coastal zone. In the area of the planned project, these sediments occur in a belt about 900-1000m wide, to a depth of about 8-10 (p. figures below). These are medium to fine sands, with isolated fields of coarse sands.

The deeper parts of the bed, more than 1 km from the shoreline are lined by sands and silts of the early delta front (cf. figures below). Below is a complex of deltaic sediments 10-15 m thick, represented by sands and silts, underlain by polygenetic sandy sediments, designated as sands, glacial, fluvial and marine gravels. The seafloor sediment complex in the project area is bipartite and represents an initially terrestrial and then marine phase of formation.

The older part of the cover, forming under terrestrial conditions, is related to the formation of the Vistula delta from the end of the Pleistocene until the time of lithorhynic transgression during the Atlantic period of the Holocene. Dating of the sediments of this series indicates accumulation occurring in an interval of about 7,770 - 2,490 years BP. At the beginning of the delta's formation, the shore of the Baltic reservoir was several kilometers north of today's shoreline. The oldest part of the delta identified so far, dated to the end of the Pleistocene, was formed at a water level 30 - 35 m lower than the present one. In the project area, the bottom of the deltaic sediments reaches about 25 meters below sea level, and the thickness of the sediments is more than 10 meters. Younger deltaic sediments, interpreted as the front of the modern delta as described above, occur farther offshore - about 1 km away (p. figures below).

The deltaic formations are represented by silty sands or silts with sandy interbeds. The sediments are usually calcareous and contain plant detritus and shells of freshwater mussels, snails, and clams. In places, they are co-occurring with sea clam shells.

The younger, marine part of the Holocene cover in the bottom of the Gulf of Gdańsk in the investment area consists of medium- and fine-grained sands with isolated fields of coarse-grained sands. The thickness of the sandy cover varies from a few centimeters to about 6-8 m in the coastal zone, most often ranging from 1 to 2 m. The formation of the marine cover is associated with lithoric transgression during the Atlantic Holocene. The maximum phase of transgression reached inland today, probably beyond the brown dune zone. It is represented by marine sediments of medium-grained sands, well sorted, in the lower part in places with admixtures of coarser material. The sands are thinly interlayered with plant detritus and pieces of wood with accumulations of amber. In the deeper basement - mainly on Cretaceous formations and only locally on Tertiary formations - lie various Pleistocene formations, including various ages of glacial till and a thicker series of interglacial Emsian marine sediments.

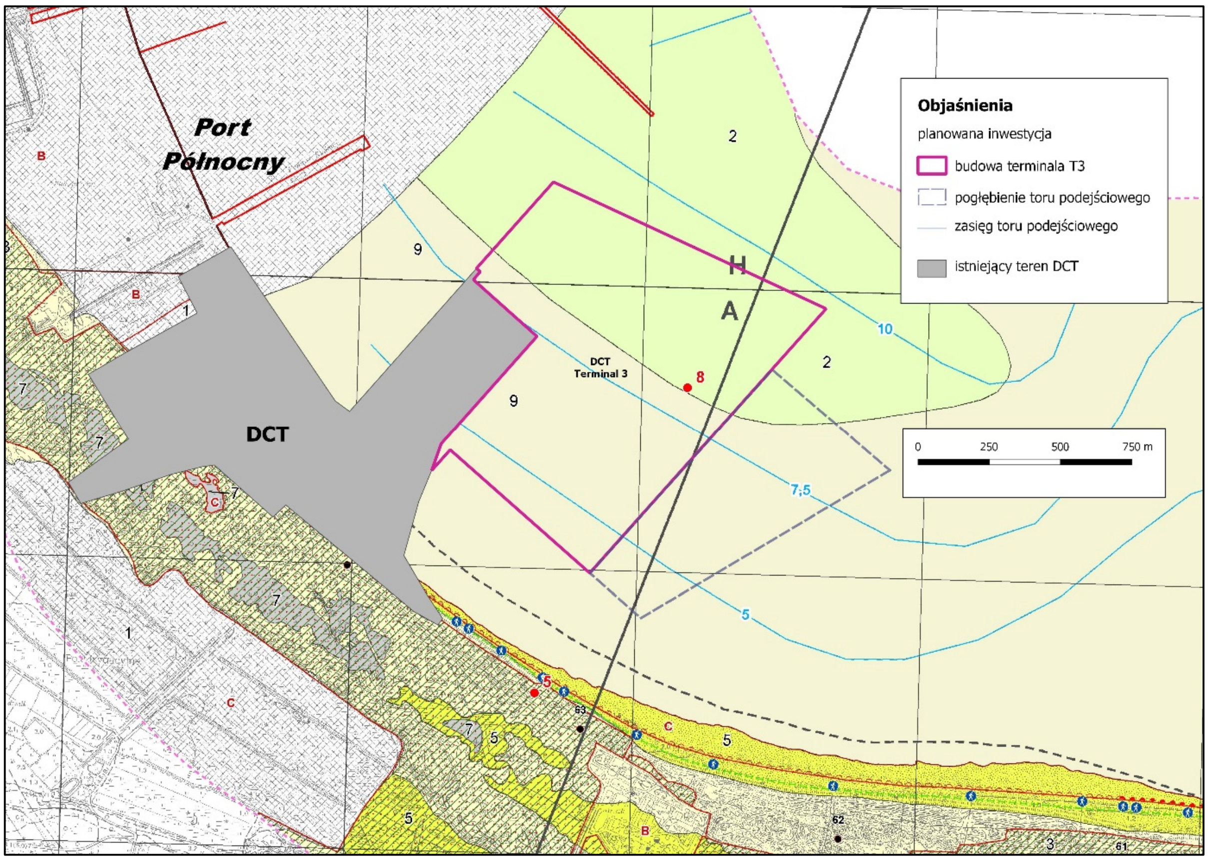

Figure 41: Geological structure of the bottom of the Gulf of Gdańsk in the area of the planned investment - lithological map.

Abbreviations: 2 - sands and silts of the modern delta front, 3 - aeolian sands, 5 - beach and spit sands, 9 - marine and lagoon silty sands and sands.

Source: Geodynamic map of Polish coastal zone of the Baltic Sea - sheet 55 - Westerplatte and sheet 56 – Stogi.

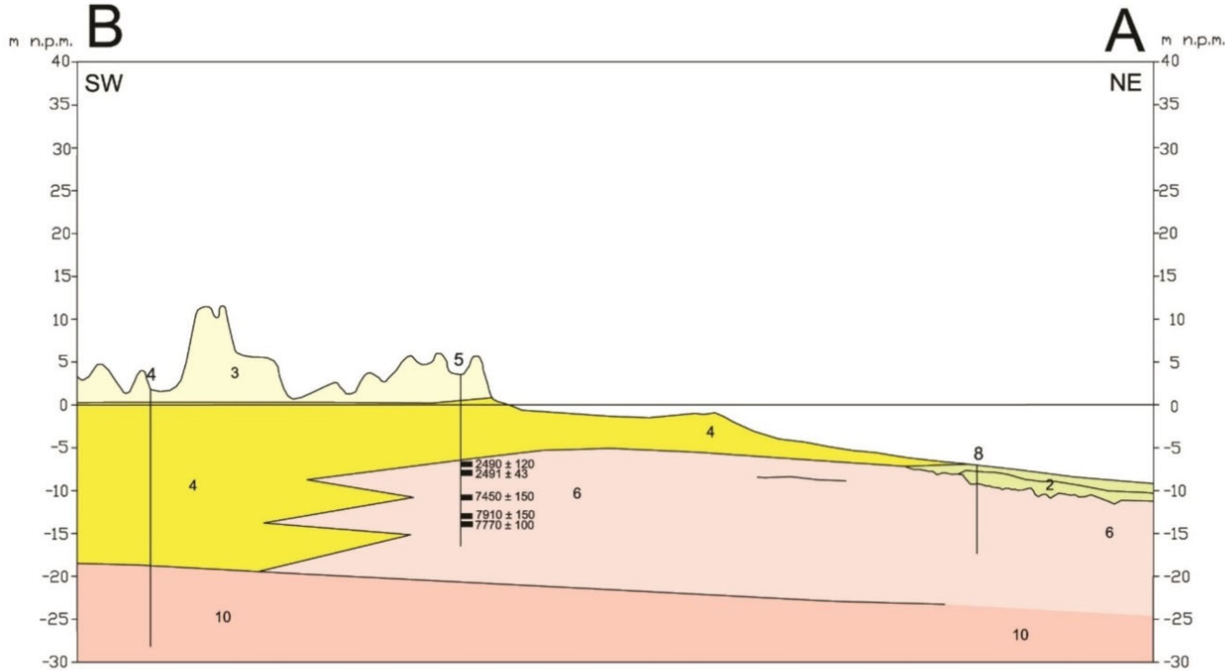

Figure 42: Geological structure of the bottom of the Gulf of Gdańsk in the area of the planned investment - geological cross-section.
Abbreviations: 2 - sands, silty sands of the modern delta front, 3 - aeolian sands, 4 - marine, beach, spit and lagoon sands and silty sands, 6 - deltaic sands and silts, 10 - water-glacial, fluvial and marine sands and sands with gravels.
Source: Geodynamic map of Polish coastal zone of the Baltic Sea - sheet 56 – Stogi.

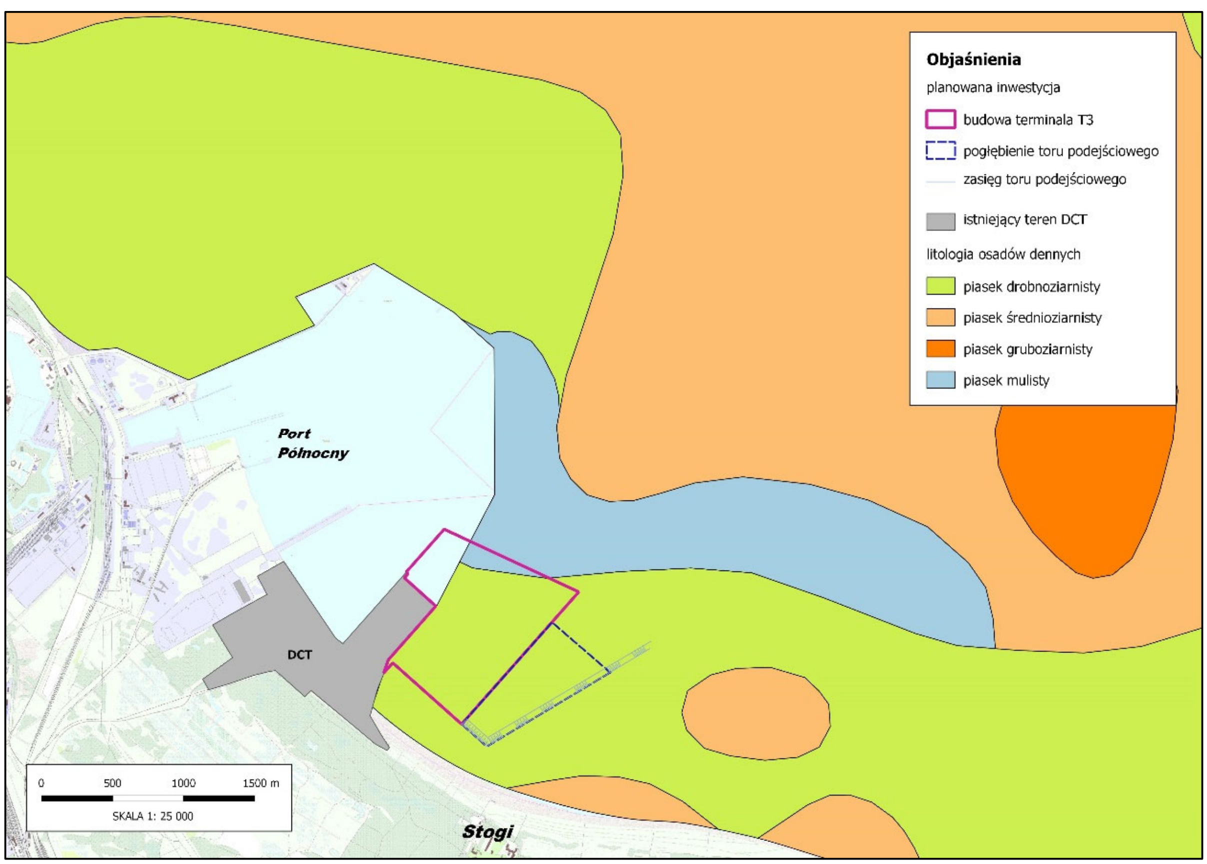

Figure 43: Lithology of the bottom sediments of the Gulf of Gdańsk in the area of the planned investment.
Source: Geological map of the Baltic Sea bottom in scale 1: 200,000, thematic shp layers (PGI Warsaw).

The land base of the planned investment in its vicinity is made up of aeolian (dune) sands, constituting the highest part of the Holocene sediment cover. The dunes are arranged in three morphogenetic zones: brown dunes, yellow dunes, and white dunes. The youngest front dunes, called white dunes, are a few meters high and are built contemporaneously at the immediate back of the beach. The interdune depressions expose sands of marine accumulation (see figure above).

6.2.2 Bottom sediments

The analysis and evaluation was based on available results from bottom sediment surveys performed in areas adjacent to the proposed project.

Within the framework of dredging works conducted in 2011-2012 by Przedsiębiorstwo Robót Czerpalnych i Podwodnych Sp. z o.o. in Gdańsk on behalf of DCT Gdańsk SA, 3 sediment samples were collected in the area of the loading berth and analysed by the accredited Laboratory of the Department of Environmental Protection of the Maritime Institute in Gdańsk. The analysis and evaluation was based on the currently inapplicable provisions of the Regulation of the Minister of Environment of 16 April 2002 on the types and concentrations of substances that cause the spoil to be contaminated (Dz.U. No. 55, item 498). According to this regulation, 8 heavy metals, 7 polycyclic aromatic hydrocarbons - PAHs and 7 polychlorinated biphenyls - PCBs were determined and their concentrations should be below the regulation limits in order to consider the sediment as uncontaminated. This, in turn, allowed us to assume that it is not hazardous, within the meaning of the current Act of 14 December 2012 on waste (Dz.U. 2013, item 21, as amended).

Heavy metal contamination of bottom sediments:

Sand and silt sediments deposited in the area of the Gdańsk Container Terminal bottom are not contaminated sediments (see table below). The content of analysed chemical substances in sediments is significantly lower than the applied reference values valid in the study period - defined in the Regulation of the Minister of Environment of 16 April 2002 (WSC 2002) (the Regulation is currently repealed).

Table 6 Contents of heavy metals in sediments of reloading berth of DCT Container Pier in Port Północny in Gdańsk (03.2011r.)

Test item	Content (mg/kg sm)			MoE 2002 standard:
	Test 1	Test 2	Test 3	
Arsenic	p.1,25	p.1,25	p.1,25	≤30
Chromium	0.75±0.16	2.11±0.45	3.29±0.69	≤200
Zinc	3.35±0.80	13.6±3.2	23.4±5.6	≤1000
Cadmium	p.0.05	p.0.05	0.06±0.02	≤7.5
Copper	0.72±0.22	3.4±1.0	5.3±0.16	≤150
Nickel	0.84±0.21	2.46±0.62	3.87±0.98	≤75
Lead	0.82±0.24	2.98±0.87	5.2±1.5	≤200
Mercury	0.12±0.04	0.14±0.05	0.14±0.05	≤1

The surficial sandy sediments are poorly contaminated by metals, the amounts of which are typical for the coastal zone of the Gulf of Gdańsk.

Contamination of bottom sediments with organic substances:

The contents of organic pollutants (PCB;PAH) in the sediments of the coastal zone of the Gulf of Gdańsk are very low, which is why the dredged material in the area of Port Północny should be treated as non-polluted (see table below).

Table 7 Contents of organic pollutants (mg/kg sm) in sediments of DCT Container Pier in Port Północny in Gdańsk (03.2011)

Tested components	Content (mg/kg sm)			MoE 2002 standard:
	Test 1	Test 2	Test 3	
Polycyclic aromatic hydrocarbons PAHs				
Benzo(a)anthracene	0.002±0.001	0.009±0.004	0.009±0.004	≤1.5
Benzo(b)fluoranthene	0.011±0.003	0.007±0.002	0.015±0.005	≤1.5
Benzo(k)fluoranthene	0.003±0.001	0.002±0.0006	0.003±0.001	≤1.5
Benzo(ghi)perylene	0.004±0.001	0.008±0.002	0.011±0.003	≤1.0
benzo(a)pyrene	0.007±0.002	0.008±0.002	0.010±0.003	≤1.0
Dibenzo(a,h)anthracene	0.007±0.002	0.010±0.003	0.011±0.003	≤1.0
Indeno(1,2,3-cd)pyrene	0.001±0.0003	0.007±0.002	0.007±0.002	≤1.0
Polychlorinated biphenyls (PCB)				
Sum of PCBs 28, 52, 101, 118, 138, 153 and 180	p.0.0001	0.0064±0.0032	0.0179±0.009	≤0.3

The results confirm trace contamination of the bottom sediments of the T 1 region by PAHs and PCBs.

The total metal content in the analysed samples ranged from 0.47 to 2.55% of the standard, the PAH content from 0.41 to 0.77% of the standard, and the PCB content from 0.03 to 5.9% of the standard.

Summary indices that determine the quality of bottom sediments:

Table 8 Contamination status of bottom sediments at the berth of DCT Container Pier in Port Północny (16.03.2011)

Metals	Unit	Total content (ΣMe)			ΣMeNorm MS 2002
		1	2	3	
1 - 8	mg/kg sm	7.9	25.99	42.5	≤ 1663.5
WWA total content (ΣWWA)					
1 - 7	mg/kg sm	0.035	0.051	0.066	≤ 8.5
PCB total content (ΣPCB)					
1 - 7	mg/kg sm	p.0.0001	0.0064	0.0179	≤ 0.3

Conclusions on the quality of bottom sediments:

Based on the results obtained, it was concluded that:

- none of the surface sediment samples were found to exceed the concentrations of heavy metals, polycyclic aromatic hydrocarbons (PAHs), and total PCBs that cause the dredged material to be contaminated,
- dredged material is suitable for dumping in the sea.

Depending on the lithology and cleanliness of the bottom sediments, a suitable option of dredged material disposal will be selected, either at the maritime flail site indicated by the Maritime Office in Gdynia or to the reactivation of the shore within the designed pier.

The obtained results of sediment cleanliness studies in the area of the operating Terminal and 121 core samples performed as part of the planned modernization of the approach fairway to Port Północny suggest that the dredged material coming from the area of the required dredging will be uncontaminated.

Prior to dredging, the contractor shall conduct reconnaissance and testing to determine if the provisions of the Waste Act apply to the dredged material. According to Article 2(7) of the Waste Act of 14 December 2012 (Dz.U. of 2013, item 21, as amended), the provisions of this Act "*shall not apply to sediments moved within surface waters for the purpose of managing waters or fairways, managing waters or water facilities, or protecting against flooding or reducing the effects of floods and droughts, reclamation, land reclamation, land reclamation, extraction or treatment, if the sediments are not hazardous*. " This provision implements in the Polish legal order Article 2(3) of Directive 2008/98/EC on waste, stating that *"without prejudice to obligations under other relevant Community legislation, sediments relocated inside surface waters for the purpose of managing waters and fairways or of preventing floods or of mitigating the effects of floods and droughts or land reclamation shall be excluded from the scope of this Directive if it is demonstrated that the sediments are non-hazardous."*

As can be seen from the above, the Directive and the Waste Act are applicable to dredged material:

- that contains or is contaminated with hazardous substances,
- management of which, whether hazardous or not, goes beyond movement for water management purposes.

In other cases, the Waste Act does not apply to dredged material.

If the spoil is given the status of waste - this waste is classified in group 17 05 of the waste catalogue[15]:

17	Waste from the construction, repair and demolition of buildings and road infrastructure (including excavated soil from contaminated sites)
17 05	Soil and earth (including soil from contaminated sites and dredge spoil)
17 05 05*	Dredged material containing or contaminated with hazardous substances
17 05 06	Dredging spoil other than those mentioned in 17 05 05

Thus, in a situation where the *Regulation of the Minister of the Environment of 16 April 2002 on the types and concentrations of substances that cause excavated material to be contaminated* is no longer in force and where no analogous regulation can be expected to be issued on the basis of the new Waste Act (there is no delegation in the Act to issue a regulation), the provisions of Article 4 of the Waste Act, as clarified in the *Regulation of the Minister of the Environment of 23 September 2016 on the detailed conditions for recognising hazardous waste as non*-hazardous waste, should be followed. The assignment of waste to code 17 05 06 rather than code 17 05 05* must follow a test procedure that complies with this regulation.

In the implementation of the first stage of the procedure described in the aforementioned regulation, the guidelines presented by the Helsinki Commission should be followed: „**HELCOM Guidelines for the Disposal of Dredged Material at Sea** (Adopted in June 2007) and Form for Reporting on Disposal of Dredged Material at Sea (Approved by HELCOM MONAS 9 in October 2006)"[16]. Similar guidelines have also been issued by OSPAR Convention for the protection of the marine environment of the North-East Atlantic, **Revised OSPAR Guidelines for the Management**

[15] Regulation of the Minister of the Environment of 9 December 2014 on the waste catalogue (Dz. U. 2014, Item 1923).
[16] http://www.helcom.fi/stc/files/Guidelines/GuidelinesDredgedMaterial.pdf

of Dredged Material"[17]. These guidelines outline the information that is needed to determine the potential possibility of depositing spoil at sea. It is necessary to evaluate the physical, chemical, and biological properties of the spoil and the biological effects that may be caused by its deposition. An important element in assessing the properties of the ore is its chemical state, i.e., the extent to which it is contaminated by heavy metals and other compounds. Both the HELCOM and OSPAR guidelines set out a first-class list of elements and compounds that must be tested for in dredged material. In some cases, the chemical analysis may need to be expanded to include compounds on the secondary list. It is important to note, however, that the guidelines discussed above do not specify concentration limits from which it can be determined that the spoil is or is not contaminated. However, these concentrations for groups of substances were given in *Appendix No. 3* to the already repealed *Regulation of the Minister of Environment of 13 May 2004 on the conditions under which waste is considered non-hazardous*, and now they result from ***the Regulation of the Minister of Environment of 23 September 2016 on detailed conditions for considering hazardous waste as non*-hazardous waste** (Dz.U. 2016 item 1601), which refers directly to the Directive stating that the detailed "**conditions for considering hazardous waste as non-hazardous waste and how to determine the fulfilment of these conditions** are set out in **Annex III to Directive** 2008/98/EC of the European Parliament and of the Council of 19 November 2008 **on waste** and repealing certain Directives (Dz. Journal EU L 312 of 22.11.2008, p. 3, as amended)".

As already mentioned - all results of dredge spoil surveys conducted to date in Port Północny area at locations comparable to the one where the dredging is to be carried out indicate that the excavated spoil is not expected to have hazardous waste characteristics and therefore it is almost certain that sediments, in particular silts and clays, will be forwarded to the spillway as part of the **procedure** for sediment transfer within surface waters for the purpose of water or waterway management, **which is not subject to the provisions of the Waste Act**.

6.2.3 Bottom bathymetry

The project work area is located east and northeast of the Marine Container Terminal (T 1). Due to the presence of the breakwaters of Port Północny, the area in question is dominated by sediment accumulation processes. There are no current, detailed data on bottom bathymetry in the area of the proposed work. The description of bathymetry was based on data from geodynamic maps of the Polish Baltic coastal zone (sheet 55 - Westerplatte and sheet 56 - Stogi). As can be seen from these materials, the area of the planned project is located in the depth range of about 4 to 10 m. A 7.5 m isobath runs through the central part of the planned terminal area - at a distance of about 900-950 m from the shore. The 10 m isobath is located slightly north of the project area at a distance of more than 1,500 m from shore. As a result of recent investments in Port Północny area, including construction of the DCT facilities (terminals T 1 and T 2), as well as previous dredging of the approach fairway, the shape of the seabed has been significantly transformed. In the area of the existing terminals, the bay bottom has been considerably deepened to more than 15 m. The data from the survey conducted in the area of Terminal T 2 - prior to its construction (survey conducted by ZMPG Gdańsk S.A. dated 31.01 - 01.02.2011) indicate that the 15 m isobath runs at a distance of approximately 380 m from the shoreline, and the 16 m isobath at a distance of approximately 390

[17] http://www.ospar.org/v_measures_spider/browse.asp?menu=00820431000000_000000_000000&v0=dredged

m. These depths are significantly different from the isobath values provided on the geodynamic maps.

The bottom bathymetry in this zone changes with each stronger wave, but mainly in the reef zone. Outside this zone, the bottom is characterized by a uniform slope toward the northeast. The average bottom slope in the 3 to 10 m depth interval is approximately 1:150.

6.3 Hydrogeological conditions and groundwater

The planned project is located in a marine area, outside of designated groundwater bodies. The main groundwater reservoir GZWP No 111 Subniecka Gdanska occurs in the terrestrial environment of the planned investment. Due to the depth of the aquifer and its good isolation from the land surface, the reservoir does not have a protection area.

In terms of groundwater bodies, the project's land base is located within the PLGW200015 unit. It is a single water body characterized by good quality and quantity status of water resources.

Two main aquifers were identified in the study area: the Upper Cretaceous and the Quaternary aquifers. The main utilization level is the Cretaceous aquifer, whose waters are of better quality than those of the Quaternary aquifer (high contents of iron and chlorides). It is associated with sandy sediments occurring at depths of about 150 m below sea level, underlain by Quaternary sediments (sands and gravels of water-glacial origin, boulder clays), Miocene sediments (sands and silts) and upper layers of Cretaceous sediments (limestones and marls with flints and galconite). The water table of the Cretaceous horizon is under strong hydrostatic pressure, creating sub-artesian and in places even artesian conditions. The water level stabilizes in the area of the planned investment of approx. 0 m above sea level. In recent years, as a result of reduced exploitation of the waters of this level, a rise in the stabilized water table has been observed. The efficiency of the aquifer is high and amounts to 70-120 m^3/h. The waters of the Cretaceous horizon are not threatened by pollution from the surface due to the fact that they are covered by poorly permeable formations of large thickness. According to the hydrogeological map of Poland (sheet 27 - Gdańsk) the degree of threat to the aquifer is low.

The Upper Cretaceous aquifer is subject to underground drainage of an ascent character to the Gulf of Gdańsk. This drainage involves the slow seepage of water through difficult permeable overlying layers and the seabed. This is due to the high hydrostatic pressure of the level waters, which is higher than the bay waters. The ascending drainage of the waters of the Cretaceous layer is carried out over a distance of several kilometers from the shore.

The anticipated construction and dredging activities taking place in the upper part of the Vistula delta sediment cover will not cause changes in the level isolation and a threat to the quality and quantity of its resources.

6.4 Maritime coastal waters

6.4.1 Transitional water bodies and their ecological status

The area of the planned project is located entirely within a fragment of the Baltic Sea (Gulf of Gdańsk), classified as transitional waters and internal sea waters. According to the division into surface water bodies, this is the Inner Gulf of Gdańsk designated with the code TW IV WB 4 (Figure 44). It belongs to natural water bodies of transitional type - bays with sandy substrate, periodically stratified.

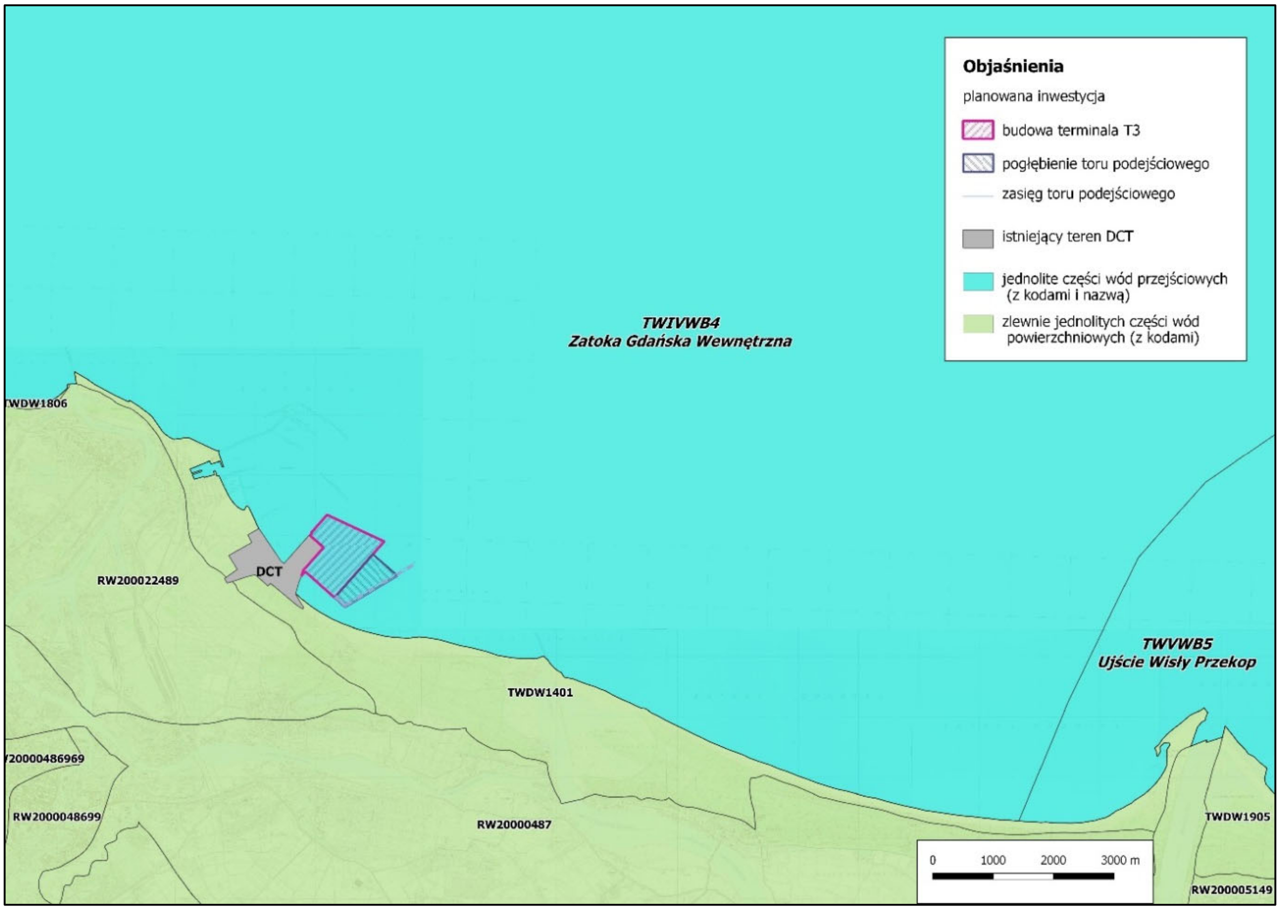

Figure 44: Location of the project on the background of transitional water bodies and catchment areas of surface water bodies.
Source: database Państwowe Gospodarstwo Wodne Wody Polskie [access: 11.05.2018].

6.4.2 Water Levels and Storm Risks

Water level measurements carried out at Gdańsk-Nowy Port station since 1886 give very representative material for both design and research purposes.

The mean sea level calculated from the 1886-1991 measurement series was 502.0 cm and showed an increasing trend of 1.5 mm per year. Differences in mean annual water levels between years can reach about 20 cm. The range of long-term extreme average monthly water levels may exceed 70 cm in the autumn-winter season, 20 to 40 cm in the summer season. There are two phases: reduced levels from February to June and elevated levels from July to December.

Analyzing the seasonal distributions of storm surges in the Gulf of Gdansk and their duration, it can be concluded that during the year water levels above 550 cm may appear 3-4 times, and states of 600 cm appear no more often than once every two years. The average storm surge above 0.5 m takes about 31-32 hours, and above 0.8 m takes about 9 hours. The average storm surge ranges from about 10 to about 16 cm/hr, and the largest storm surges were 21 and 22 cm/hr.

According to the existing data, the absolute recorded maximum occurred in 1843 and was 664 cm, contemporary in 1983 - 638 cm. Since 1986, when the water level gauge was moved to Port Północny, no extreme levels have been recorded at the water gauge. Rarely did the water level exceed 600 cm. The absolute minimum occurred in 1887 - 395 cm. The lowest of the lowest sea levels observed between 1969 and 1998 was 414 cm.

Based on many years of observations, Wróblewski (1992) determined the characteristic sea levels with specific exceedance probabilities (Table 9).

Table 9 Probabilities of occurrence and recurrence periods of maximum and minimum sea levels in Gdańsk according to Wróblewski (1992)

P (%)	99	80	50	20	10	5	2	1	0.5	0.1
T (years)	1.01	1.25	2.0	5	10	20	50	100	200	1000
Maximum annual sea levels										
Sea level [cm]	538	558	573	594	608	621	639	651	664	694
Minimum annual sea levels										
Sea level [cm]	464	400	440	427	420	413	406	400		384

The sea level according to observations from 1951 to 2008 was characterized by a marked rise. The fastest growth was characterized by spring (2.3 cm/10 years) and winter (2.2 cm/10 years).

The sea level is projected to continue to increase, with values varying depending on the adopted scenario of global CO_2 emissions. The emissions scenarios project a sea level rise of about 4-5 cm from the reference period for 2011-30. The largest increase is indicated by the A1B scenario - more than 5 cm along the entire Coast, while the smallest increase is indicated by the A2 scenario - the annual mean sea level rise will exceed slightly 4 cm. The table below presents the projected changes in the annual mean and periodic sea level values for the Nowy Port station, according to individual emission scenarios for 2011-2030.

Table 10 Predicted changes (cm) in mean sea level for the station in Gdańsk Nowy Port in particular seasons in 2011-2030 for three emission scenarios (in relation to the reference period 1971-1990).

	Year	Spring	Summer	Autumn	Winter
B1	4.6	2.8	5.1	5.6	5.9
A1B	5.5	4.3	6.9	5.0	4.5
A2	4.3	3.5	4.3	6.6	1.4

Source: Own elaboration based on Jakusik E. et al, 2012, "Sea level in the Polish coastal zone - current state and expected changes in the future" [in:] Wibig J. (ed.), Jakusik E. (ed.), "Climatic and oceanographic conditions in Poland and in the South Baltic Sea", IMWM-NRI, Warsaw.

The projected mean level of the Baltic Sea at the end of the 21st century (2081-2100) is characterized by a significant increase in values compared to the 1971-1990 reference period (Jakusik, Wibig 2012). Depending on the assumed emission scenarios associated with global CO_2 emissions, the projected Baltic Sea level rise takes on different values. The smallest increase - with the B1 emission scenario - is still significant at + 20 cm. The average annual sea level is projected to rise from about 20 cm to about 28 cm during the period 2081-2100. The table below presents the forecasts of the Baltic Sea water level rise for the Gdańsk Nowy Port area under particular emission scenarios.

Table 11 Predicted changes (cm) in mean (H av.), minimum (H5%) and maximum (H95%) sea level for the station in Gdańsk Nowy Port in the period 2081-2100 for three emission scenarios (in comparison with the reference period 1971-1990).

Scenario	Hav.	$H_{5\%}$	$H_{95\%}$
B1	20.5	16.5	25.4
A1B	25.3	20.3	31.4
A2	28.3	22.7	35.0

Source: Own elaboration based on Jakusik E., Wibig J. (eds.), 2012, Climatic and oceanographic conditions in Poland and the South Baltic Sea. Expected changes and guidelines for developing adaptation strategies in the national economy; IMGW, PIB, Warsaw.

According to the study by Cieślak (2001), when calculating the wave field transformation in both the far and near field, one should assume a water level with a probability of occurrence of 5% (once in twenty years) while taking into account the sea level rise, caused by the greenhouse effect, after a period of 50 years, i.e.: calculated water level = 631 + 30 = 661 cm.

The adoption of the above water level recurrence interval is due to the adoption of wave parameters with a probability of occurrence of once in a hundred years. The simultaneous occurrence of water level and wave parameters with probabilities of p = 1% is unlikely, and the combined probability of such an event will be far less than 1% (Numerical Studies..., 2009).

Sea level rise has serious consequences for the coastal zone, as well as the marine environment and coastal waters themselves. The greatest threat comes from maximum water surges that accompany storms. The definition of a storm surge is a hydrological situation during which the sea level reaches or exceeds 570 cm at Polish stations (Sztobryn et al. 2012). The rise in mean sea level increases the threat of storms - wave heights rise. Storm surges are observed most often during autumn and winter. They pose a serious threat to the coast. They cause damage to the coastal zone, both on beaches and dunes and on cliff shores, and impede port operations.

Compared to the first half of the 20th century, the risk from stormwater flooding doubled in the late 20th century. The trend analysis of the storm surge index over the last years indicates an increase of the storm hazard on the Polish coast of the Baltic Sea.

With projected sea level rise and hydrodynamic activity, coastal destruction on the Baltic coast will intensify. According to forecasts, the erosion of cliffs, dunes and spits will intensify mainly within the open sea coasts, but the acceleration of these processes will also be felt within the Gulf of Gdańsk. According to previous studies, the highest hazard of storm surges at the analysed sea stations of the Baltic coast (Świnoujście, Ustka, Hel) occurs in Świnoujście, and the lowest in the region of the Gulf of Gdańsk - at the station in Hel.

6.4.3 Ice phenomena

Ice on the open water in front of Port Północny may appear in late November or later and not recede until March. The average number of days with ice in this area for the multi-year is 19, the minimum is 0, and the maximum is 76 (Dziadziuszko, 1994). The greatest thickness of solid ice in sheltered areas of the coast, as determined on the basis of long-term observations, is 0.50 m in the area of Gdańsk and Gdynia harbours (Maritime Structures..., 2008). The predominant type of ice is ice floe.

Coastal solid ice rarely extends further out to the open sea, but moving fields formed of broken or compacted ice can impede navigation, or pose a threat to hydraulic structures.

The number of days with icing is projected to decrease as a result of projected increases in air temperature during the 21st century. (Jakusik, Wibig 2012). Projections indicate that for emission scenarios B1 and A1B, fewer days with icing can be expected in the Baltic Sea in the period 2011-2030 than in the reference period (Sztobryn et al. 2012) The results for scenario B1 indicate a decrease of 20% at all analysed measurement points, with the change value increasing slightly in the eastern direction.

6.4.4 Physical and chemical conditions

The description of hydrological and hydrochemical conditions was based on data provided by IMGW Maritime Department in Gdynia from the cruise reports: and Preliminary Assessment of the State of the Environment of Marine Waters in the Polish Baltic Sea Area.

In March 2013, an amendment to the Act of 4 January 2013 amending the Water Law Act and certain other acts came into force, implementing Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for action in the field of marine environmental policy (the so-called Marine Strategy Framework Directive (MSFD) (OJ UE 164, 25.06.2008, p. 19) (www.samorzad.lex.pl). The objective of the MSFD is to achieve *Good Environmental Status (GES*) of the marine environment by 2020[18].

The assessment of the environmental status of the marine waters of the Baltic Sea is currently carried out by sub-basins corresponding to the coastal and transitional water bodies. The marine part of the planned project is located within the coastal water body TW IV WB 4 Inner Gdańsk Bay. Within its boundaries are located : 1 measuring and control point and 2 measuring stands (**Figure 45**).

Physical and chemical indicators used in classification include:

- water transparency (Secchi disk visibility),
- organic matter content (TOC),
- the degree of oxygen saturation of the waters,
- nutrient content - especially total nitrogen and phosphorus.

The latest available data published by the Chief Inspectorate of Environmental Protection (Report on the State of the Environment of Poland in 2014) do not specify the values of physicochemical indicators within the Gulf of Gdańsk as well as other bodies of water in the Baltic Sea. Therefore, the description of these indicators was based on previous measurements (Report on the state of the environment in Poland 2008, data from the Institute of Meteorology and Water Management).

[18] Good environmental status means "the environmental status of the marine waters making up the ecologically diverse and dynamic oceans and seas, which are clean, healthy and productive in relation to their conditions, and the use of the marine environment is at a level that is sustainable and safeguards the use and activities of present and future generations." Achieving good marine environmental status is possible through the implementation of a marine strategy.

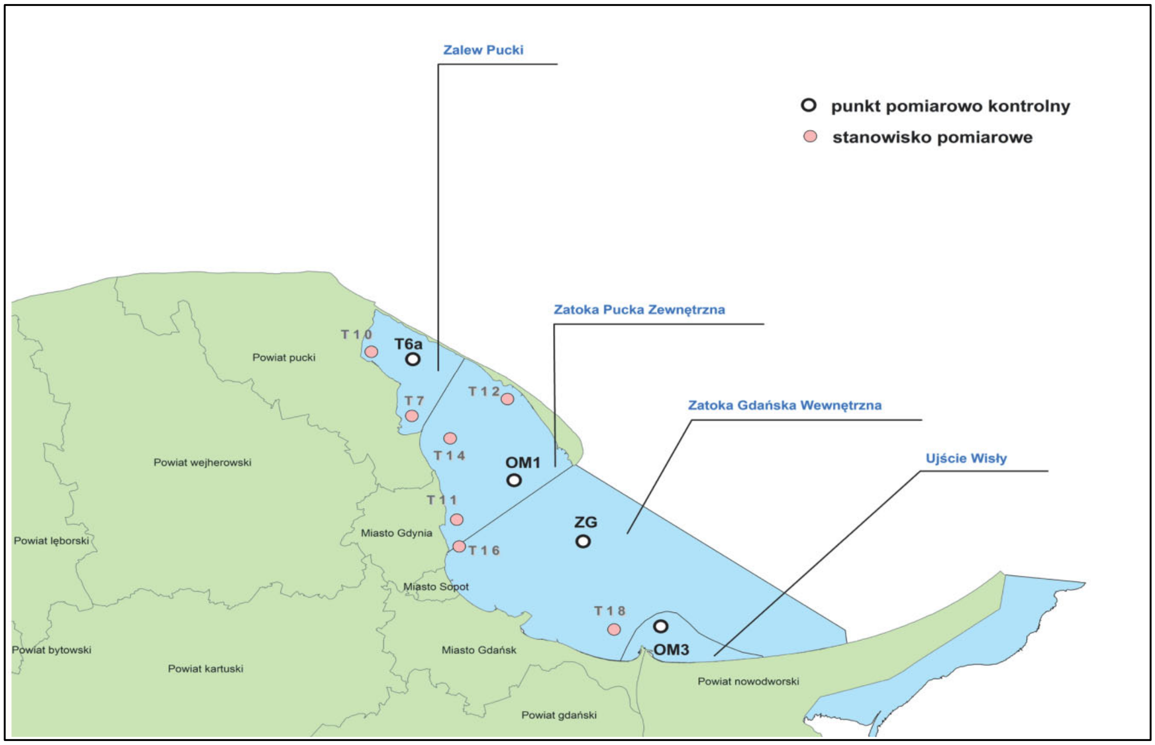

Figure 45: Location of measurement and control points and measurement stands within transitional waters in Pomorskie Voivodeship.
Source: (WIOŚ 2017).

Transparency

The transparency of waters in the area of the planned investment is shaped mainly by the mutual interaction of the Vistula waters and the waters coming from the open sea part of the Gulf of Gdańsk. River water from the Vistula contains very large amounts of suspended solids and dissolved substances. The latter also cause the river waters to have a yellowish color, which distinguishes them from the greenish waters of the open bay. This was reflected in the adoption of different limits for the classification of the water transparency index of the inner Gulf of Gdańsk[19].

The picture of the spatial distribution of water transparency resulting from the directions of water flow is superimposed on the variability of transparency caused by the seasonal cycle of changes in the biological activity of the aquatic ecosystem. During the warm months, due to the intense growth of aquatic plant and animal life, water transparency decreases throughout the Bay.

Over the past two decades, there has been a marked decrease in transparency during the spring and summer months, averaging about 0.1 m year^{-1}. This gives a reduction in Secchi depth values of about 1.5 meters over 16 years (1981 - 1997).

According to the study of WIOŚ in 2016, the transparency of the water of the bay at the control point was 3.22 m, which according to the currently used classification corresponded to a condition below good.

[19] Annex 3 to the Regulation of the Minister of Environment of 21 July 2016 on the method of classification of the state of surface water bodies and environmental quality standards for priority substances - tab. (Dz. U. 2016, Item 1187).

The indicators presented characterize the trend of changes in the general state of the environment. Changes in water transparency result from the increasing influence of the Vistula's waters on the waters of the Gulf of Gdańsk, causing an increase in biological production. There is a clear relationship between transparency and the amount of suspended solids contained in the water.

Biogen content

According to the most recent study in 2016, the concentrations of the vast majority of the studied nutrients in the waters of the Gulf of Gdańsk remained below good status, indicating eutrophication of the waters. Among the examined indices deciding about such a qualification of the bay waters were the contents of total and nitrate nitrogen, total phosphorus and phosphate phosphorus.

Table 12 Nutrient contents in the Inner Gulf of Gdańsk waters according to studies conducted in 2016
(source: Report on the state of the environment in Gdańskie Voivodeship in 2016]

Indicator	Content in water	Class[20]
Nitrate nitrogen (mg $N\text{-}NO_3$/l)	0.32	PSD
Total nitrogen (mg N/L)	0.52	PSD
Mineral nitrogen (mg N/l)	0.356	II
Phosphate phosphorus (mg $P\text{-}PO_4$/l)	0.019	PSD
Total phosphorus (mg P/L)	0.057	PSD

As indicated by the results of studies in previous years (Comprehensive Report on the State of the Environment in Pomorskie Voivodeship in 2013-15, WIOŚ 2016), the physicochemical status of the waters of the Inner Gulf of Gdańsk remains at a similar level over the years 2010-15. It does not differ from other water bodies of transitional and coastal waters of the southern Baltic Sea in the voivodeship (see figure below).

[20] According to the Regulation of the Minister of Environment of July 21, 2016 on the method of classification of the state of surface water bodies and environmental quality standards for priority substances (Dz. U. 2016, Item 1187).

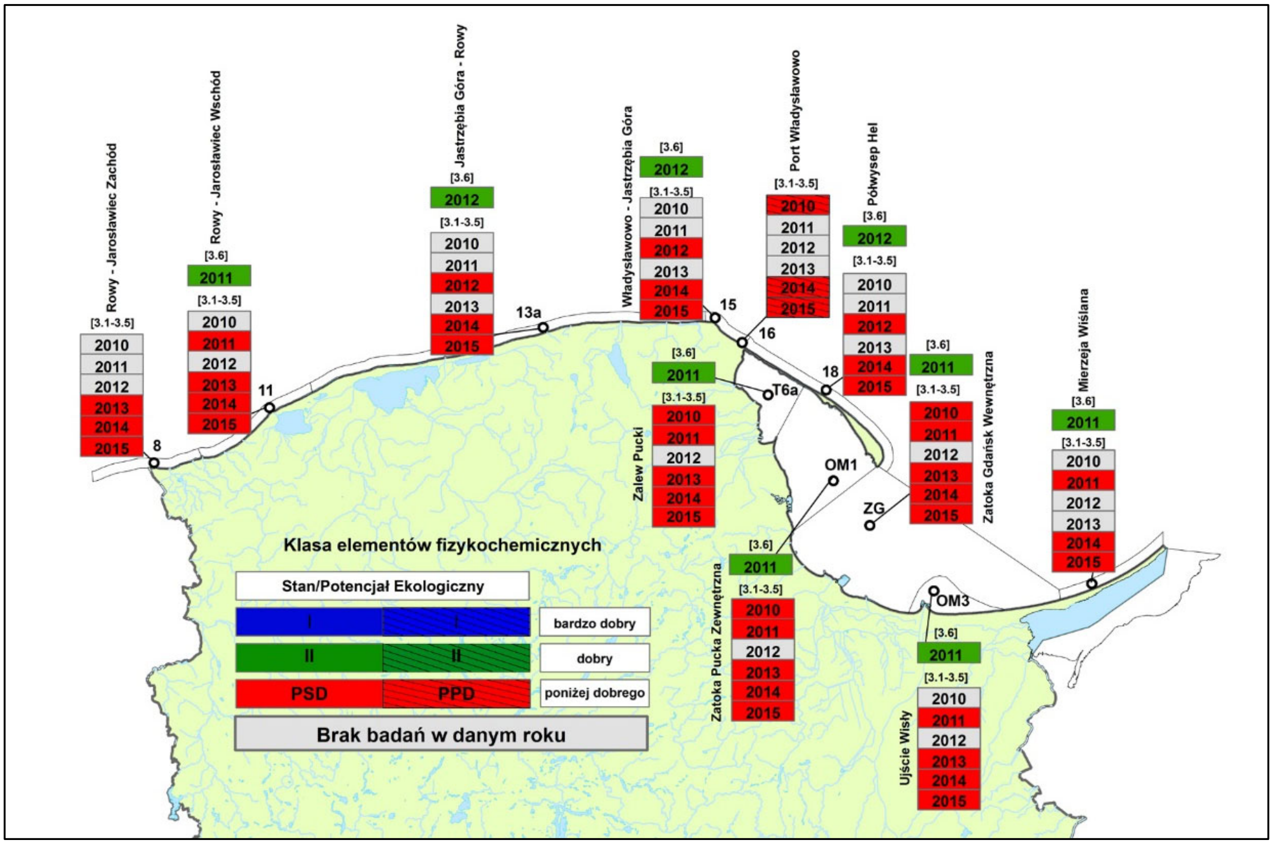

Figure 46: Classification of the quality status of coastal and transitional waters in terms of physicochemical indicators in 2010-2015.
Source: Comprehensive report on the state of the environment in Pomorskie Voivodeship in 2013-15 (WIOŚ 2016).

6.4.5 Biological indicators

Major biological indicators used in water quality assessment include:

- chlorophyll-a content,
- phyto-plankton biomass,
- abundance of macrozoobenthic organisms.

According to the results of studies published in the Report on the state of the environment in Poland in 2014 (Chief Inspectorate of Environmental Protection), the Gdańsk Bay water body was classified as below good status both in terms of water eutrophication assessment (chlorophyll-a) and parameters determining the seabed integrity feature based on the abundance and composition of macrozoobenthic organisms.

Table 13 Status of the marine environment of the Inner Gulf of Gdańsk in 2014

Indicator		Water status[21]
phytoplankton	average concentration of chlorophyll a during the summer months (V-IX)	Below the good
Seabed integrity	Zoobenthos, phytobenthos	Below the good

Source: Report on the state of the environment in Poland 2014. (GIOŚ 2015)

Water surveys for phytoplankton and benthic macroinvertebrates were performed in 2016 (WIOŚ 2017). The assay results are shown in the table below. The overall assessment of the examined

[21] The classification used the limit values included in the regulation of the Minister of Environment of 20 August 2008 on the method of classification of the state of surface water bodies (Dz.U. of 2008, No. 162, item 1008).

indicators in 2016 indicates the 5th class – poor biological status of waters due to the low values of the benthic macrosocolleor index (multimetric B index).

Table 14 Status of the biological elements of the marine environment of the Inner Gulf of Gdańsk basin according to the research conducted in 2016

Indicator	Index value	Class[22]
Chlorophyll 'a'	5.09	3
Benthic macroinvertebrates	1.9	5

Source: Report on the state of the environment in Pomorskie Voivodeship in 2016 (WIOŚ 2017).

As indicated by the results of studies from previous years (Comprehensive Report on the State of the Environment in Pomorskie Voivodeship in 2013-15, WIOŚ 2016), the biological status of the waters of the Inner Gulf of Gdańsk changed over the years 2010-15 (cf. figure below). In comparison with other bodies of transitional and coastal waters of the southern Baltic Sea in the voivodeship, it can be concluded that the biological status of the bay in recent years is moderate, better in relation to the water bodies in the western part of the voivodeship.

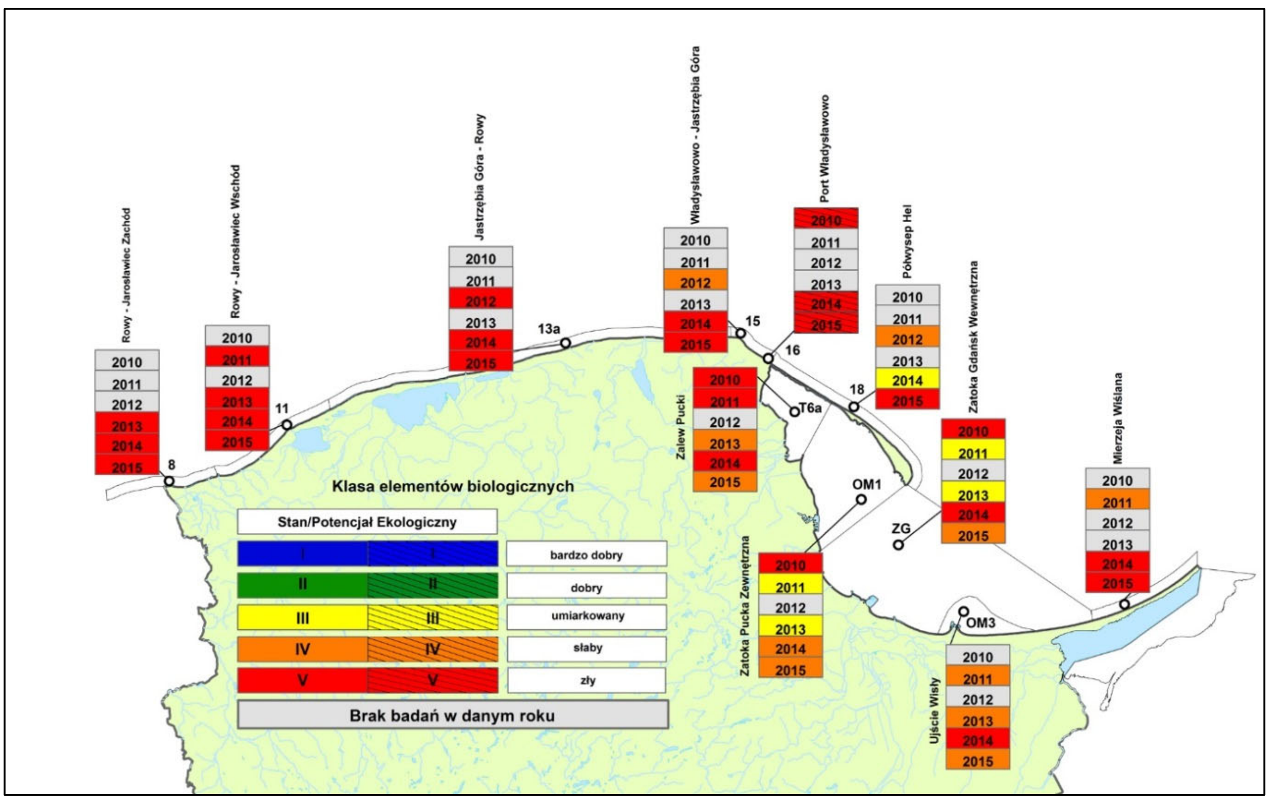

Figure 47: Classification of the quality status of coastal and transitional waters in terms of biological indicators in 2010-2015.
Source: Comprehensive report on the state of the environment in Pomorskie Voivodeship in 2013-15 (WIOŚ 2016).

[22] According to the Regulation of the Minister of Environment of July 21, 2016 on the method of classification of the state of surface water bodies and environmental quality standards for priority substances (Dz. U. 2016, Item 1187).

6.4.6 General ecological status of the Gulf of Gdańsk waters

In terms of ecological status, the Inner Gulf of Gdańsk was classified as a water body with poor status in 2016. The classification was based on research done in 2016. The indicators deciding about the classification of the water body were the content of chlorophyll a, macrozoobenthos, values of transparency and concentrations of biogens - total nitrogen and total phosphorus.

In previous years, the ecological status of the bay's waters oscillated between poor and poor. In this respect, the ecological status of this transitional water body does not differ from the ecological status/potential of other coastal and transitional water bodies both in the voivodeship and in the whole Polish coastal strip.

The reasons for the poor ecological status of the Inner Gdańsk Bay waters are mainly pollutant loads carried with the waters of watercourses (mainly the Vistula River), as well as from the municipal sewage treatment plants and industrial plants. For example, in 2006 about 236 262 thousand m^3 of treated municipal wastewater was discharged from the Gdańsk area into the waters of Gdańsk Bay. It should be mentioned that the city of Gdańsk introduces a small load of pollutants into the waters of the Gulf of Gdańsk as compared to the load introduced with the waters of the Vistula River. The load introduced from the Gdańsk area ranges from 0.5% in the case of suspended solids to 2.32% in the case of total nitrogen load carried by the Vistula River waters, while the outflow from the city area is about 0.84% of the Vistula River outflow.

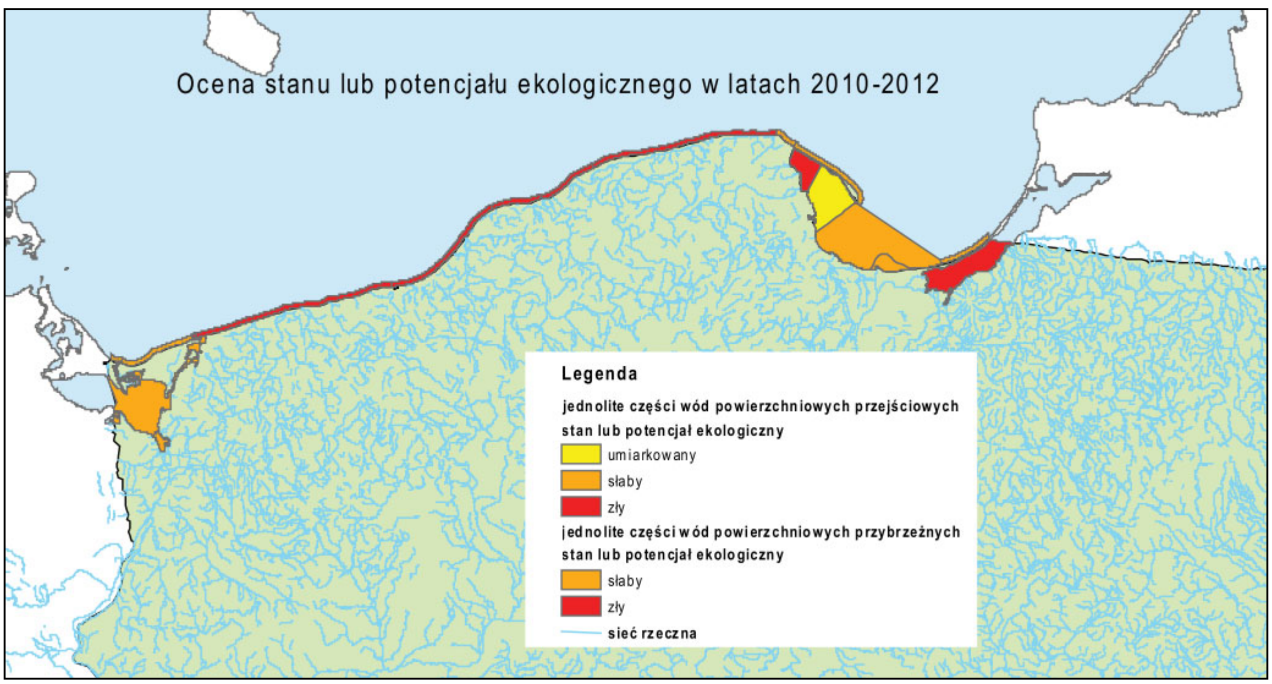

Figure 48: General assessment of ecological status and potential of transitional and coastal waters in Poland.
Source: Report on the state of the environment in Poland in 2014 (GIOŚ).

6.4.7 The state of cleanliness of bathing waters

The state of cleanliness of the coastal waters is controlled annually at the nearest bathing site in Stogi by a program carried out by the State Sanitary Inspectorate. The waters of the bathing site are monitored and analysed by the supervising District Sanitary and Epidemiological Station in Gdańsk. The bathing water cleanliness status of the Stogi bathing site was characterized based on the data published in the Bathing Sites Service (https://sk.gis.gov.pl/) and in the bathing site profile sheet (2017).

The overall water quality status of the bathing water in Stogi from 2014 to 2017 was described as good in each year. In 2016, between 24 June and 31 August, the bathing water was twice rendered unsuitable for bathing due to exceedances of microbiological parameters and cyanobacterial blooms, resulting in the temporary closure of the bathing site. Similarly, algal blooms due to cyanobacteria observed in 2015. These phenomena, however, are not related to the activities of the DCT port. In 2017, the bathing waters were tested 6 times between 20 June and 29 August - each time the bathing waters were found to be suitable for bathing, so the bathing waters operated without restrictions throughout the summer season.

No exceedances of microbiological parameters were found at the bathing site in the previous four-year period (2011-2014). No tarry materials, cyanobacteria blooms, or excessive proliferation of marine phytoplankton in amounts that threaten the health of bathers were observed. Therefore there were no grounds to issue a permanent or temporary bathing ban for the Gdańsk Stogi bathing site. The State Regional Sanitary Inspector in Gdańsk classified the water quality in the Gdańsk Stogi bathing site as "good". Older, archival data on the quality of bathing water in Stogi in 2011 are included in the study "Assessment of the state of the environment in the city of Gdańsk for 2011" (2012) of the Municipal Office in Gdańsk. The assessment of bathing water suitability was conducted in accordance with Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality.

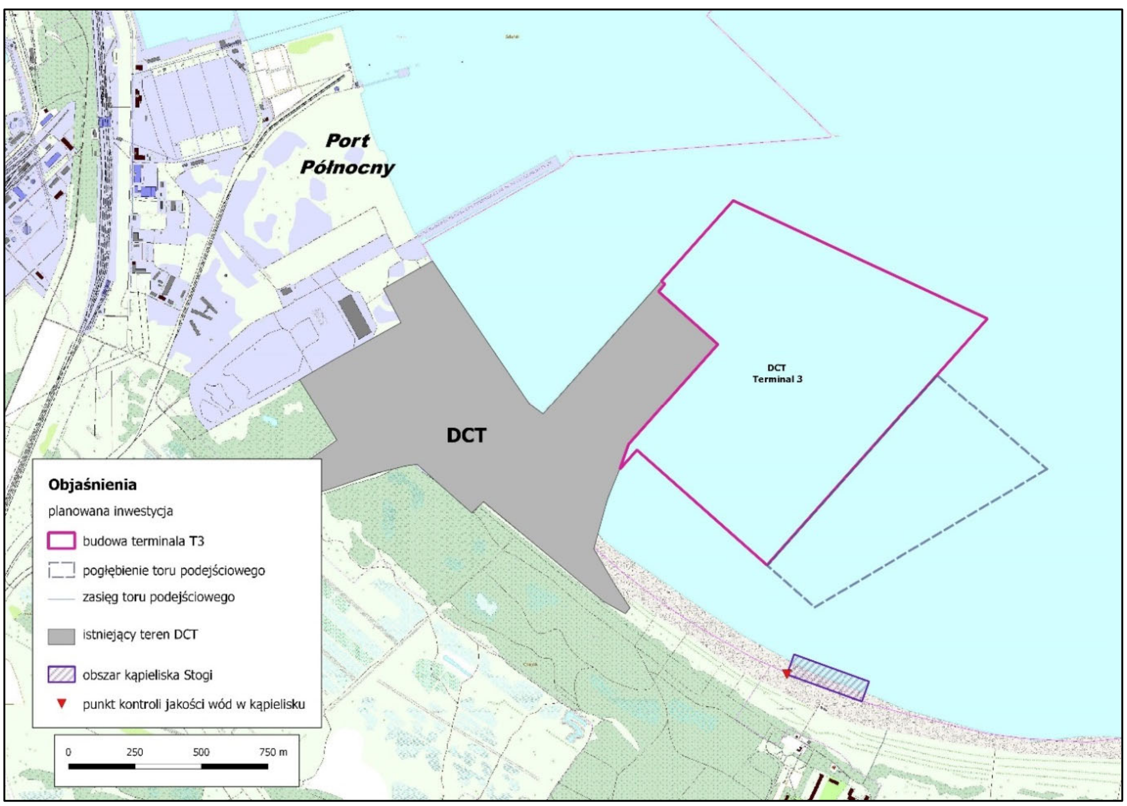

Figure 49: Location of the planned investment against the background of the bathing site boundary in Stogi and the water quality control point (research conducted by the PSSE Gdańsk).

In marine coastal waters, indicators were determined: enterococci, *Escherichia coli* and the threat of cyanobacteria. Water quality assessment in marine bathing sites was performed in accordance with the Regulation of the Minister of Health on the conduct of supervision over bathing water quality in bathing sites and places used for bathing. The points closest to the planned project are located at the Stogi marine bathing site, marked with points 5 and 6.

Marine coastal waters were evaluated microbiologically based on 2 indicators of contamination and additionally organoleptically for cyanobacteria and other contaminants.

Considering the annual average indicators of microbiological pollution, it should be concluded that at point 5 the average level is clearly lower than at points 7-14.

Results of the 2011 seasonal water quality assessment for *E.coli* bacteria *at* Stogi bathing site (p. 5 and 6) indicate excellent quality. In terms of enterococci content, water quality was good at point 5 and excellent at point 6.

There were also no cyanobacteria blooms or excessive proliferation of macroalgae or marine phytoplankton in the study waters on the sampling days. There was also no record of tar, glass, plastics, rubber or other waste on the surface of the water.

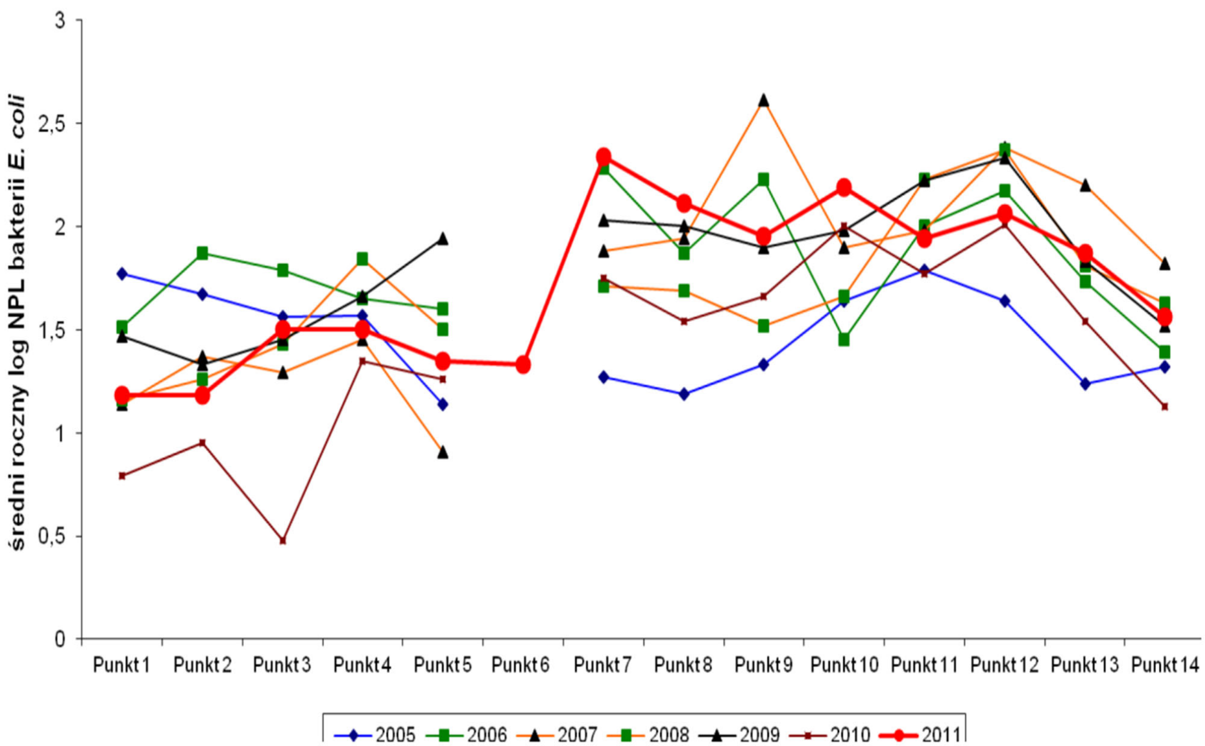

Figure 50: Comparison of the sanitary status of the marine coastal waters of the Gulf of Gdańsk with respect to the Escherichia coli indicator in 2005-2011.
Source: Assessment of the state of the environment in the city of Gdańsk for the year 2011, Municipal Office in Gdańsk, Department of the Environment, Gdańsk.

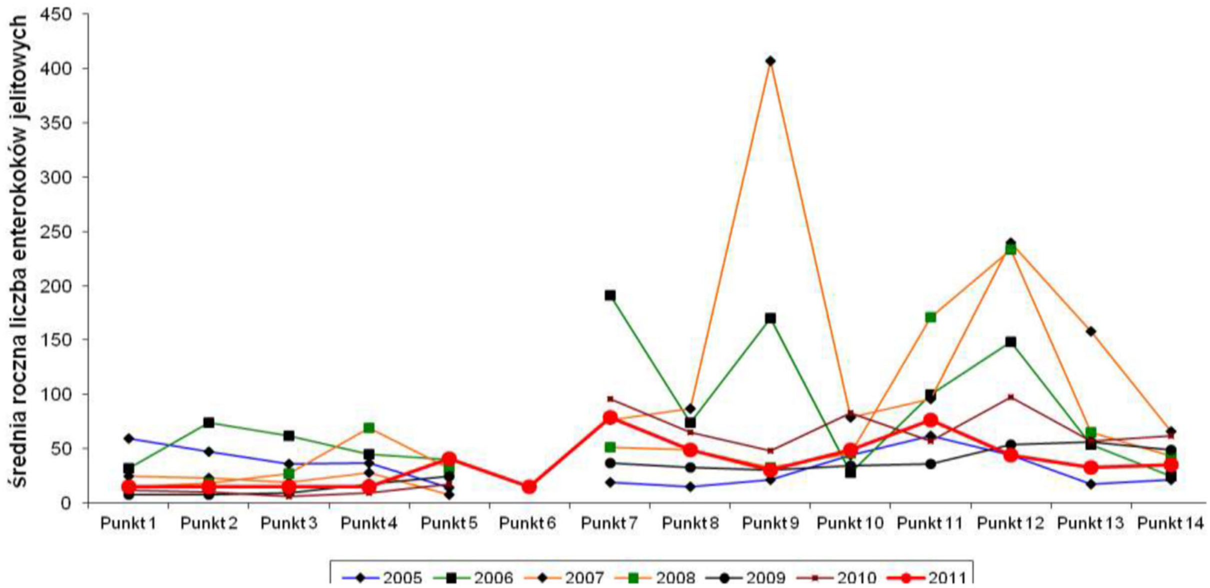

Figure 51: Comparison of the sanitary status of the marine coastal waters of the Gulf of Gdansk in relation to the enterococci index in the years 2005-2011.
Source: Assessment of the state of the environment in the city of Gdańsk for the year 2011, Municipal Office in Gdańsk, Department of the Environment, Gdańsk.

6.5 Climatic conditions and state of air cleanliness

6.5.1 Climatic and meteorological conditions

The Gdańsk area is located in the climatic region of the Gdańsk Bay coast, which is characterized by

- small annual, monthly and daily temperature amplitudes;
- low maximum and high minimum air temperatures,
- delaying the thermal seasons,
- extending the transition period between summer and winter,
- relatively low precipitation,
- lower temperatures in the spring compared to autumn,
- strong winds, mainly from the western sector,
- occurrence of sea breeze.

The elements that characterize the climate of a region and at the same time have a decisive influence on the spread of pollutants in the atmospheric air are:

- temperature and humidity
- winds (their directions, speeds, frequency of occurrence)
- precipitation,
- vertical balance of the atmosphere.

The description of meteorological conditions in the analysed area was based on data from "Klimatyczny Atlas Polski" (Climatic Atlas of Poland) and detailed local meteorological conditions based on measurements at regional monitoring station AM2 and AM3 of ARMAAG located in Gdańsk Stogi, ul. Kaczeńce (AMG2) and in Nowy Port (AM3) along with model data that were used for atmospheric equilibrium analysis (WRF model).

The table below lists selected meteorological parameters according to the data from the AM2 measuring station, located in the area of the planned investment in Stogi for 2016.

Table 15 Average values of some meteorological parameters during the heating and summer seasons in 2016

Atmospheric pressure [hPa]		Temperature [ºC]		Moisture content [%]		Wind speed (m/s)	
season season	summer season	summer season	summer season	summer season	summer season	summer season	summer season
10188.4	1017.7	3.8	15.3	79.2	71.1	2.7	2.3

6.5.1.1 Temperature and humidity

Air temperature is a factor in the formation of many other meteorological elements. This is especially true for relative humidity, fog formation, vertical and horizontal air movements, and local winds.

The Gdańsk area is characterised by relatively small differences in air temperature throughout the year. The average annual temperature amplitude is about 21.5^{o}C. The highest average monthly temperature is recorded in July (17.9^{o}C), and the lowest temperature - in February (- 3.6 ^{o}C).

In multi-year measurements, an increase in the amplitude of monthly average temperatures to 27.3oC was observed in 2010 compared to long-term data, with a maximum temp of 35^{o}C in July and a minimum temp of -22.3^{o}C in February.

Among the ARMAAG stations monitoring ambient air quality and meteorological parameters in Tri-City, the AM3 station - located in Nowy Port - is characterized by the lowest values of average annual temperatures. In 2016, the average annual temperature there was 8.1 ^{o}C. The lowest average monthly temperatures relative to other stations in the Tri-Cities area are also recorded here in the warmest month (July) and the coldest month (January). Slightly higher annual and monthly temperatures are recorded at station AM2 in Stogi.

Table 16 Average monthly and average annual temperature at ARMAAG measurement stations Gdańsk Nowy Port and Stogi in 2016

Station	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Year
Stogi	-1.8	3.5	4.5	8.2	13.8	17.5	18.6	17.7	15.7	8.5	4.4	3.6	9.5
Nowy Port	-3.2	2.0	3.0	6.8	12.3	16.2	17.3	16.3	14.7	7.2	2.9	2.0	8.1

Changes in thermal conditions associated with a warming climate were assessed in a study by IMGW, among others (Jakusik, Wibig 2012). The analyses included in it indicate that the increase in air temperature for the period 1951-2010 in the coastal area is similar to the average for the whole Poland. This was estimated to be 0.2°C per 10 years. For the winter and spring seasons, the positive trend in temperature change is most pronounced, with winter at 0.3°C/10 years and spring at 0.4°C/10 years. In summer and fall, the observed increase is 0.2°C and 0.1°C per decade, respectively.

There is also a systematic increase in the frequency of the number of hot days per year. Since the 1990s, there has been a significant increase in area average summer air temperature anomaly values.

The considered scenarios of further air temperature changes predict that in the time horizon 2011-2030 the mean annual air temperature on the Baltic coast will not change significantly in relation to the mean values from the reference period 1971-1990. The projected temperature increase for emission scenarios B1 and A1B will not exceed 0.1°C. Slightly larger changes may occur for the A2 scenario, for which cooling is expected relative to the reference period (Miętus et al., 2012).

The location of Gdańsk in the zone of direct influence of the sea causes that the area is characterized by quite high relative humidity, amounting to 75 % on average throughout the year.

During the winter months, the degree of water vapour saturation increases to over 80%. The lowest humidity is recorded during the spring months. High humidity promotes the formation of fogs, making it difficult for pollutants to disperse, so it is a negative phenomenon from the point of view of air cleanliness.

The highest frequency of fog is recorded in late fall and winter, as well as in the month of April. Ground fog and haze are common during the morning hours.

6.5.1.2 Wind

In the Gdańsk area the prevailing winds are from the west, southwest and south. Winds from the west, southwest, and northwest directions together account for 53% of all observations. Winds from the north and east are the least frequent. Measurements at the AM2 station (Stogi) show a significant share of winds from the southern and south-western direction, which constitutes a difference in anemometric conditions in the vicinity of the planned investment, compared to other areas of the Tri-City. Among all ARMAAG measuring stations, the share of winds from the southern sector at the Stogi station (AM2) is definitely the highest. In 2016, it amounted to 13.5% and was the highest among all directions. At the same time, there is an increased percentage of winds from the northeast direction.

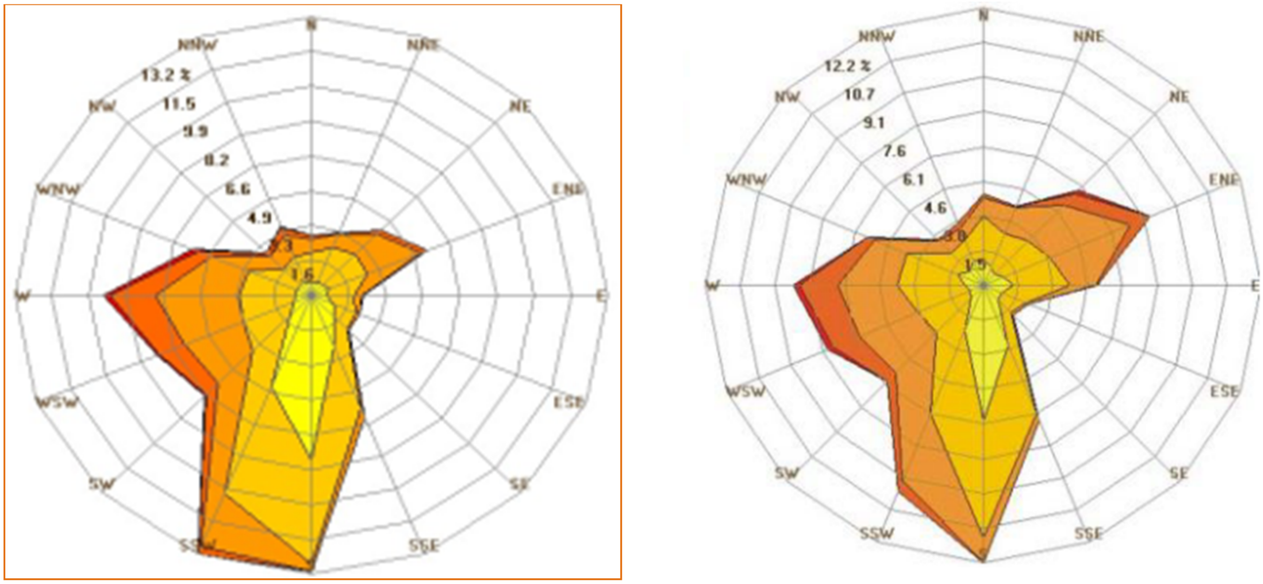

Figure 52: Wind rose in 2012 and 2016 (right) at station AM2 in Stogi.

A factor that significantly affects the intensity of dispersion is wind speed. Winds with significant speeds occur mainly in autumn and winter, and the average annual wind speed here is high, ranging from 4 to 5 m/s. In the daily distribution, the highest wind speeds (5 m/s) fall on the midday hours, while in the morning and evening they remain at an average level of about 3.5 m/s. The phenomena that hinder the dispersion of pollutants are calm and winds of less than 2 m/s. The station in Stogi (AM2), which represents the area of the planned investment, is characterised by the highest wind speeds among other stations located in the Tri-City area (Figure 53). Among the stations in the area of Gdańsk is also characterized by the lowest proportion of calm - i.e. the state in which the wind speed does not exceed 1 m/s.

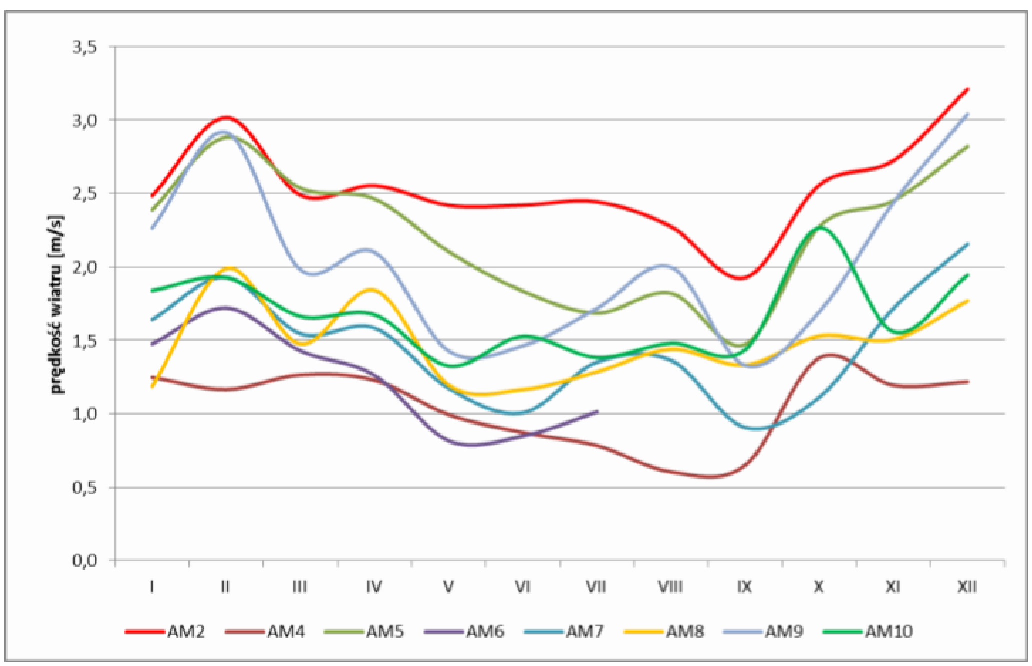

Figure 53: Average monthly wind speeds in 2016. Representative station Stogi - AM2 for the area of the planned investment

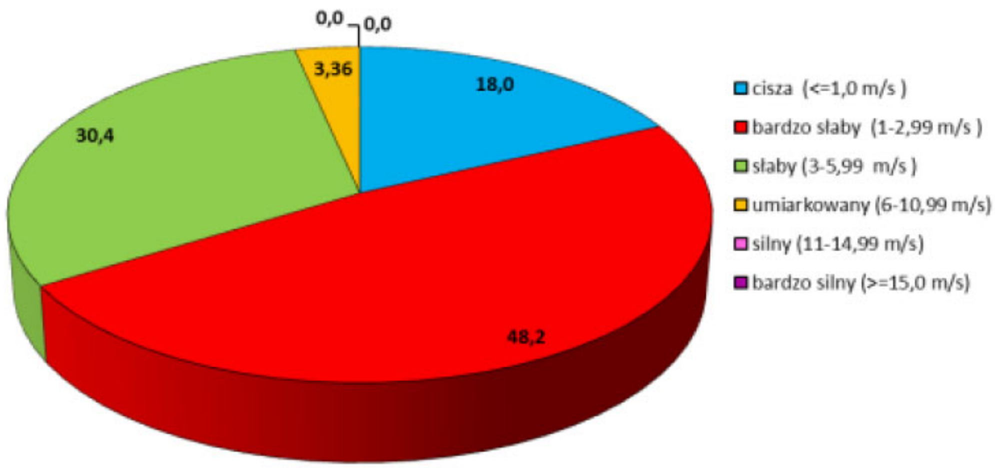

Figure 54: Frequency of occurrence of each wind speed interval at AM2 station in Stogi in 2016.

6.5.1.3 Precipitation

Atmospheric precipitation in the area of the planned investment remains at the level slightly below the average for the area of Poland (on average it does not exceed 605 mm). The distribution of precipitation throughout the year in Gdańsk is characterized by a precipitation predominance in the summer season (about 59 % of the mean annual precipitation), with the maximum falling in July. On the other hand, the lowest precipitation is recorded during the winter months - December, January and February. The total number of days with precipitation is about 146, dominated by days with low (1-5 mm/day) and very low (<1 mm/day) precipitation. Precipitation measurements have been made at station AM2 since 2008. Also in the case of this parameter, significant differences from year to year are recorded. Annual precipitation totals from 2012 to 2016 are presented below. The precipitation recorded here during this period did not exceed 550 mm, and the average for this period was 477 mm.

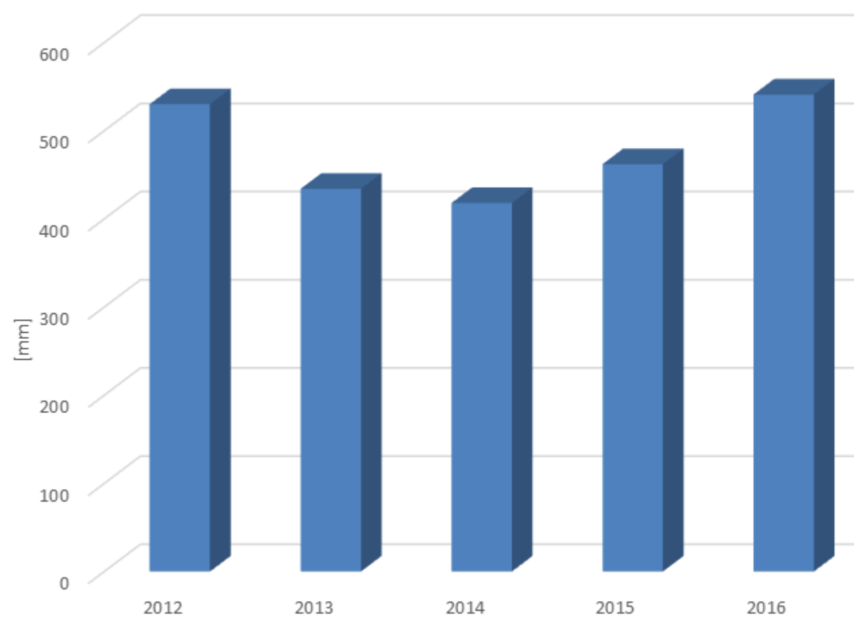

Figure 55: Annual precipitation totals at Stogi station (AM2) in 2012-2016.

6.5.1.4 Vertical equilibrium of the atmosphere

Air temperature varies with altitude, and the rate of change is locally determined by the vertical temperature gradient. Analysing the values it can take, there are 6 cases characterizing the vertical movement of air masses, the so-called equilibrium states of the atmosphere. Effective dilution of contaminants is favoured by unstable equilibrium (states 1, 2, 3), while the least favourable conditions in this regard are found in steady equilibrium (states 5 and 6). In the analysed region, unstable and highly unstable equilibrium (states 1,2,3), occurs 20 % of the time during the year, mainly with south and southeast winds of 2 - 5 m/s. Neutral equilibrium is the most common, accounting for 51.7% of observations. Constant equilibrium (states 5 and 6) - the least favourable for pollutant dispersion occurs 28% of the time during the year. This type of atmospheric equilibrium occurs primarily during the night and early morning hours (8 pm - 6 am).

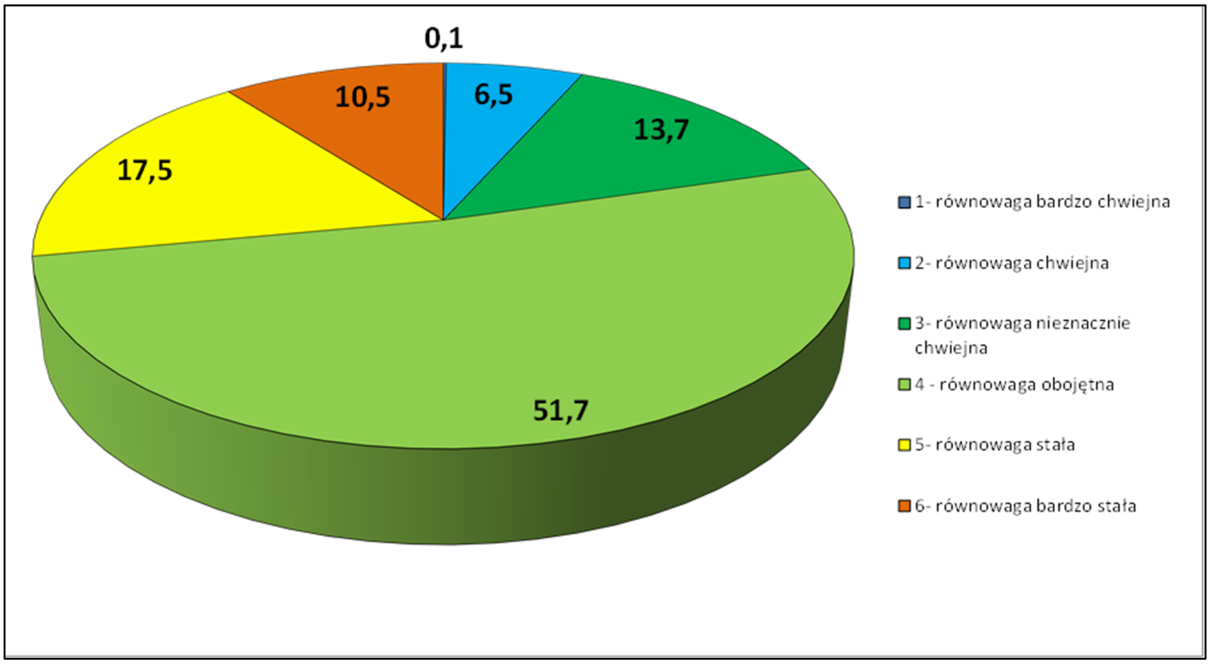

Figure 56: Classes of atmospheric stability at the AM2 station in Gdańsk Stogi in 2012.

6.6 Description of natural elements and protected areas

6.6.1 Biological elements of the marine environment

6.6.1.1 Invertebrates/macrozoobenthos

In material collected in the adjacent project area (sites 1-14 cf. Chapter "Description of the Invertebrate/Macrozoobenthos Survey Method"), a total of 17 benthic macroinvertebrate species and the suborder *Oligochaeta* were identified (tables below).

Taxonomic composition was typical of the shallow to mid-depth bottom zone. According to the current regulations on animal species protection including the Regulation of the Minister of Environment of 16 December 2016 on the protection of animal species (Dz.U. 2016, item 2183), none of the found taxa represent protected species and no protection periods have been defined for them.

Of the species found, only *Monoporeia affinis* is listed on the HELCOM Red List of Baltic Sea species in danger of becoming extinct (2013) in the Least Concern (LC) category. In the area of the planned project the presence of single specimens (2 individuals) of this species was recorded only in spring (April) at two study sites. The work also recorded *Marenzelleria neglecta* which is included in the list of animals of potential concern: HELCOM Guide to Alien Species and Ballast Water Management in the Baltic Sea (2014). The presence of representatives of this species was observed throughout the area and in all study periods.

The presence of *Marenzelleria neglecta and Oligochaeta* was found in 97% of the samples collected. Permanent components of the bottom zoocenosis were *Hediste diversicolor, Mya arenaria, Macoma baltica and Corophium volutator*. Representatives of these species were present at all sites and in all survey seasons.

The diverse taxonomic composition is indicative of undisturbed conditions for the benthic invertebrate community. The good oxygen conditions prevailing in the supra-bottom layer are evidenced by the results of field measurements as well as by the presence of species penetrating the bottom sediments.

Table 17 Taxonomic composition of benthic macrofauna at individual study sites during spring

Nr stanowiska	Pierścienice (*Annalida*)					Mięczaki (*Mollusca*)					Stawonogi: Skorupiaki (Artropoda: *Crustacea*)						Łącznie na stanowisku
	Siodełkowce (*Clitellata*)	Wieloszczety (Polychaeta)				Małże (*Bivalvia*)				Ślimaki (*Gastropoda*)	*Maxillopoda*	Skorupiaki wyższe (*Malacostraca*)					
												Amphipoda			*Isopda*	*Cumacea*	
	Skąposzczety (Oligochaeta)	*Marenzelleria neglecta*	*Hediste diversicolor*	*Streblospio shrubsolii*	*Pygospio elegans*	*Mya arenaria*	*Macoma balthica*	*Cerastoderma glaucum*	*Mytilus edulis*	*Peringia ulvae*	*Amphibalanus improvisus*	*Corophium volutator*	*Monoporeia affinis*	*Bathyporeia pilosa*	*Cyathura carinata*	*Diastylis rathkei*	
1	+	+	+			+	+	+				+					7
2	+	+	+			+	+	+	+	+		+			+		10
3	+	+	+	+		+	+	+		+	+	+	+				11
4	+	+	+			+	+	+		+	+	+					9
5	+	+	+			+	+	+		+		+					8
6	+	+	+	+	+	+	+	+		+		+				+	11
7	+	+	+		+	+	+	+		+		+		+			10
8	+	+	+		+	+	+	+		+		+		+			10
9	+	+	+	+	+	+	+	+	+	+		+					11
10	+	+	+	+	+	+	+	+		+		+					10
11		+	+			+	+					+					5
12	+	+	+			+	+	+		+		+	+		+		10
13	+	+	+	+	+	+	+	+		+		+					10
14	+	+	+		+	+	+	+				+					8

Table 18 Abundance of benthic macrofauna (individuals·m^{-2}) at individual study sites during spring

Nr stanowiska	Pierścienice (*Annalida*)					Mięczaki (*Mollusca*)					Stawonogi: Skorupiaki (*Artropoda: Crustacea*)						Łącznie na stanowisku
	Siodełkowce (*Clitellata*)	Wieloszczety (*Polychaeta*)				Małże (*Bivalvia*)				Ślimaki (*Gastropoda*)	*Maxillopoda*	Skorupiaki wyższe (*Malacostraca*)					
												Amphipoda			*Isopda*	*Cumacea*	
	Skąposzczety (Oligochaeta)	*Marenzelleria neglecta*	*Hediste diversicolor*	*Streblospio shrubsolii*	*Pygospio elegans*	*Mya arenaria*	*Macoma balthica*	*Cerastoderma glaucum*	*Mytilus edulis*	*Peringia ulvae*	*Amphibalanus improvisus*	*Corophium volutator*	*Monoporeia affinis*	*Bathyporeia pilosa*	*Cyathura carinata*	*Diastylis rathkei*	
1	20	117	173	0	0	33	63	3	0	0	0	7	0	0	0	0	416
2	277	43	267	0	0	430	50	67	3	1010	0	10	0	0	3	0	2160
3	403	67	327	10	0	150	217	87	0	1132	*	30	3	0	0	0	2426
4	243	127	133	0	0	50	173	30	0	1336	*	17	0	0	0	0	2109
5	157	183	133	0	0	97	157	63	0	1680	0	7	0	0	0	0	2477
6	350	60	107	3	3	27	213	20	0	297	0	23	0	0	0	3	1106
7	23	160	90	0	17	37	87	163	0	107	0	20	0	3	0	0	707
8	43	307	67	0	27	23	60	60	0	60	0	23	0	3	0	0	673
9	187	287	67	3	30	177	127	53	3	273	0	10	0	0	0	0	1217
10	67	83	133	3	10	423	130	347	0	240	0	10	0	0	0	0	1446
11	0	233	50	0	0	127	33	0	0	0	0	13	0	0	0	0	456
12	37	10	167	0	0	20	137	17	0	107	0	147	3	0	37	0	682
13	190	240	37	3	10	347	180	153	0	47	0	10	0	0	0	0	1217
14	53	407	73	0	3	60	60	43	0	0	0	3	0	0	0	0	702

* the presence of the taxon was found on representatives of Mollusca: M. balthica and H. ulvae

Table 19 Benthic macrofaunal biomass (g·m⁻²) at individual study sites during spring

Nr stanowiska	Pierścienice (Annalida)					Mięczaki (Mollusca)					Stawonogi: Skorupiaki (Artropoda: Crustacea)						Łącznie na stanowisku
	Siodełkowce (*Clitellata*)	Wieloszczety (*Polychaeta*)				Małże (*Bivalvia*)				Ślimaki (*Gastropoda*)	*Maxillopoda*	Skorupiaki wyższe (*Malacostraca*)					
												Amphipoda			*Isopda*	*Cumacea*	
	Skąposzczety (*Oligochaeta*)	*Marenzelleria neglecta*	*Hediste diversicolor*	*Streblospio shrubsolii*	*Pygospio elegans*	*Mya arenaria*	*Macoma balthica*	*Cerastoderma glaucum*	*Mytilus edulis*	*Peringia ulvae*	*Amphibalanus improvisus*	*Corophium volutator*	*Monoporeia affinis*	*Bathyporeia pilosa*	*Cyathura carinata*	*Diastylis rathkei*	
1	0,1091	1,4641	7,2463	0,0000	0,0000	3,8238	17,5113	0,0990	0,0000	0,0000	0,0000	0,0450	0,0000	0,0000	0,0000	0,0000	30,2986
2	0,1223	0,4743	4,7690	0,0000	0,0000	2,6507	20,8098	3,1580	0,0200	5,6609	0,0000	0,0613	0,0000	0,0000	0,0213	0,0000	37,7476
3	0,3303	0,6727	3,6097	0,0077	0,0000	1,7428	97,8478	34,6595	0,0000	4,6962	*	0,2247	0,0010	0,0000	0,0000	0,0000	143,7924
4	0,2980	0,4361	1,2294	0,0000	0,0000	2,5173	55,7433	1,6904	0,0000	4,1730	*	0,1555	0,0000	0,0000	0,0000	0,0000	66,2430
5	0,1083	0,4730	1,1913	0,0000	0,0000	7,9380	60,2866	14,5130	0,0000	5,5963	0,0000	0,0153	0,0000	0,0000	0,0000	0,0000	90,1218
6	0,4069	0,6800	1,5875	0,0017	0,0017	1,2247	63,1153	9,1047	0,0000	1,1539	0,0000	2,2198	0,0000	0,0000	0,0000	0,0317	79,5279
7	0,0322	1,3293	2,5870	0,0000	0,0273	0,7267	44,8501	15,6890	0,0000	0,4979	0,0000	0,1467	0,0000	0,0170	0,0000	0,0000	65,9032
8	0,0633	3,8280	1,0660	0,0000	0,0377	0,8478	24,0201	7,2271	0,0000	0,2367	0,0000	0,1977	0,0000	0,0020	0,0000	0,0000	37,5264
9	0,2110	1,4517	2,3407	0,0010	0,0227	3,0246	35,2429	9,4480	0,0208	1,3209	0,0000	0,1063	0,0000	0,0000	0,0000	0,0000	53,1906
10	0,0330	0,4800	3,8193	0,0013	0,0033	15,1433	15,4635	12,7652	0,0000	1,1221	0,0000	0,0770	0,0000	0,0000	0,0000	0,0000	48,9080
11	0,0000	2,2900	2,8890	0,0000	0,0000	2,9800	7,6283	0,0000	0,0000	0,0000	0,0000	0,1333	0,0000	0,0000	0,0000	0,0000	15,9206
12	0,0298	0,1900	9,3957	0,0000	0,0000	1,9206	34,3417	0,2272	0,0000	0,3469	0,0000	1,4987	0,0010	0,0000	0,3177	0,0000	48,2693
13	0,2357	1,1603	0,8683	0,0007	0,0153	4,1261	41,8361	3,5581	0,0000	0,5610	0,0000	0,0557	0,0000	0,0000	0,0000	0,0000	52,4173
14	0,0560	1,3850	2,8887	0,0000	0,0090	23,8957	22,9737	8,5230	0,0000	0,0000	0,0000	0,0047	0,0000	0,0000	0,0000	0,0000	59,7358

* the presence of the taxon was found on M. baltica and H. ventrosa; biomass was determined together and assigned to the appropriate representative of Mollusca

Table 20 Taxonomic composition of benthic macrofauna at individual study sites during summer

Nr stanowiska	Pierścienice (*Annalida*)					Mięczaki (*Mollusca*)					Stawonogi: Skorupiaki (*Artropoda: Crustacea*)				Niezmogowce (*Priapulida*)	Łącznie na stanowisku
	Siodełkowce (*Clitellata*)	Wieloszczety (*Polychaeta*)				Małże (Bivalvia)				Ślimaki (*Gastropoda*)	*Maxillopoda*	Skorupiaki wyższe (*Malacostraca*)				
												Amphipoda	*Isopda*	*Cumacea*		
	Skąposzczety (*Oligochaeta*)	*Marenzelleria neglecta*	*Hediste dversicolor*	*Streblospio shrubsolii*	*Pygospio elegans*	*Mya arenaria*	*Macoma balthica*	*Cerastoderma glaucum*	*Mytilus edulis*	*Peringia ulvae*	*Amphibalanus improvisus*	*Corophium volutator*	*Cyathura carinata*	*Diastylis rathkei*	*Halicryptus spinulosus*	
1	+	+	+	+	+	+	+			+		+				9
2	+	+	+	+	+	+	+	+		+	+	+				11
3	+	+	+	+	+	+	+	+		+		+				10
4	+	+	+		+	+	+	+	+	+		+			+	11
5	+	+	+	+	+	+	+	+	+	+		+				11
6	+	+	+			+	+	+		+		+		+		9
7	+		+			+	+			+	+	+			+	7
8	+	+	+			+	+	+		+		+				8
9	+	+	+			+	+			+		+				7
10	+	+	+		+	+	+	+		+		+				10
11	+	+	+	+		+	+	+		+		+	+			9
12	+	+	+			+	+					+				6
13	+	+	+	+		+	+	+		+		+				9
14	+	+	+	+	+	+	+	+				+				9

Table 21 Abundance of benthic macrofauna (individuals·m^{-2}) at individual study sites during summer

Nr stanowiska	Pierścienice (*Annalida*)					Mięczaki (*Mollusca*)					Stawonogi: Skorupiaki (*Artropoda: Crustacea*)				Niezmogowce (*Priapulida*)	Łącznie na stanowisku
	Siodełkowce (*Clitellata*)	Wieloszczety (*Polychaeta*)				Małże (*Bivalvia*)				Ślimaki (Gastropo-da)	*Maxillopoda*	Skorupiaki wyższe (*Malacostraca*)				
												Amphipoda	*Isopda*	*Cumacea*		
	Skąposzczety (*Oligochaeta*)	*Marenzelleria neglecta*	*Hediste dversicolor*	*Streblospio shrubsolii*	*Pygospio elegans*	*Mya arenaria*	*Macoma balthica*	*Cerastoderma glaucum*	*Mytilus edulis*	*Peringia -ulvae*	*Amphibalanus improvisus*	*Corophium volutator*	*Cyathura carinata*	*Diastylis rathkei*	*Halicryptus spinulosus*	
1	147	523	87	7	13	83	60	0	0	433	0	10	0	0	0	1363
2	137	173	147	7	10	773	187	50	0	957	*	43	0	0	0	2483
3	163	250	107	3	7	753	197	40	0	373	0	30	0	0	0	1923
4	533	120	80	0	3	1047	220	20	3	533	0	33	0	0	3	2597
5	120	437	57	17	7	187	103	10	3	287	0	10	0	0	0	1237
6	23	3	43	0	0	23	70	3	0	90	0	17	0	3	0	277
7	7	0	30	0	0	7	250	0	0	340	*	3	0	0	3	640
8	33	23	23	0	0	13	67	17	0	90	0	23	0	0	0	290
9	53	7	33	0	0	193	40	0	0	1187	0	63	0	0	0	1577
10	170	127	100	0	47	203	110	133	0	157	0	207	3	0	0	1257
11	93	280	167	33	0	360	130	90	0	560	0	283	0	0	0	1997
12	173	240	87	0	0	13	33	0	0	0	0	63	0	0	0	610
13	200	340	60	3	0	260	117	17	0	57	0	27	0	0	0	1080
14	197	273	30	3	53	90	117	13	0	0	0	3	0	0	0	780

* the presence of the taxon was found on stones

Table 22 Benthic macrofaunal biomass ($g \cdot m^{-2}$) at individual study sites during summer

Nr stanowiska	Pierścienice (*Annalida*)					Mięczaki (*Mollusca*)					Stawonogi: Skorupiaki (*Artropoda: Crustacea*)				Niezmogowce (*Priapulida*)	Łącznie na stanowisku
	Siodełkowce (Clitellata)	*Wieloszczety (Polychaeta)*				*Małże (Bivalvia)*				*Slimaki (Gastropoda)*	*Maxillopoda*	*Skorupiaki wyższe (Malacostraca)*				
												Amphipoda	*Isopda*	*Cumacea*		
	Skąposzczety (Oligochaeta)	*Marenzelleria neglecta*	*Hediste dversicolor*	*Streblospio shrubsolii*	*Pygospio elegans*	*Mya arenaria*	*Macoma balthica*	*Cerastoderma glaucum*	*Mytilus edulis*	*Peringia ulvae*	*Amphibalanus improvisus*	*Corophium volutator*	*Cyathura carinata*	*Diastylis rathkei*	*Halicryptus spinulosus*	
1	0,1343	4,4455	3,3227	0,0069	0,0513	15,0124	15,2850	0,0000	0,0000	1,5437	0,0000	0,0123	0,0000	0,0000	0,0000	39,8141
2	0,0648	1,1709	3,2834	0,0048	0,0215	26,3374	14,3088	2,9281	0,0000	3,5528	*	0,1263	0,0000	0,0000	0,0000	51,7989
3	0,2611	0,4587	2,6644	0,0014	0,0020	24,0627	21,2931	16,0078	0,0000	1,4807	0,0000	0,0325	0,0000	0,0000	0,0000	66,2642
4	0,6399	0,4309	1,3506	0,0000	0,0013	26,9845	38,7811	7,4355	0,0067	2,0494	0,0000	0,0131	0,0000	0,0000	0,0238	77,7169
5	0,0913	1,2320	1,6461	0,0052	0,0008	5,0539	35,6053	2,9031	0,0490	1,0191	0,0000	0,0012	0,0000	0,0000	0,0000	47,6071
6	0,0129	0,0040	0,8683	0,0000	0,0000	3,4605	21,7373	1,2663	0,0000	0,3901	0,0000	0,1031	0,0000	0,0420	0,0000	27,8845
7	0,0117	0,0000	0,8993	0,0000	0,0000	1,2300	67,4305	0,0000	0,0000	2,2527	*	0,0137	0,0000	0,0000	0,0940	71,9318
8	0,0847	0,1460	0,6993	0,0000	0,0000	0,4633	48,0630	2,8040	0,0000	0,2077	0,0000	0,0050	0,0000	0,0000	0,0000	52,4730
9	0,0527	0,1070	0,9098	0,0000	0,0000	5,3440	9,8664	0,0000	0,0000	3,7748	0,0000	0,2383	0,0000	0,0000	0,0000	20,2930
10	0,1947	2,3161	2,1218	0,0000	0,1904	18,5922	24,5765	23,2003	0,0000	0,5908	0,0000	0,5522	0,2667	0,0000	0,0000	72,6018
11	0,0575	1,5692	2,5830	0,0199	0,0000	24,7202	17,5224	16,1666	0,0000	1,8646	0,0000	0,6202	0,0000	0,0000	0,0000	65,1235
12	0,1379	1,6364	6,3515	0,0000	0,0000	3,7678	8,5381	0,0000	0,0000	0,0000	0,0000	0,1356	0,0000	0,0000	0,0000	20,5673
13	0,3664	3,0296	3,0151	0,0025	0,0000	19,5432	33,9953	0,5967	0,0000	0,1884	0,0000	0,0730	0,0000	0,0000	0,0000	60,8103
14	0,5211	2,1654	2,1256	0,0057	0,0650	10,3299	84,4554	3,8073	0,0000	0,0000	0,0000	0,0010	0,0000	0,0000	0,0000	103,4764

* the presence of the taxon was found on stones

Table 23 Taxonomic composition of benthic macrofauna at individual study sites during autumn

Nr stanowis-ka	*Annelida*					*Mollusca*						*Artropoda: Crustacea*				Łącznie na stanowisku
	Clitellata	*Polychaeta*				*Bivalvia*				*Gastropoda*		*Maxillopoda*	*Malacostraca*			
													Amphipoda	*Isopda*	*Cumacea*	
	Oligochae-ta	*Marenzelleria neglecta*	*Hediste diversicolor*	*Streblospio shrubsolii*	*Pygospio elegans*	*Mya arena-ria*	*Macoma balthica*	*Cerastoderma glaucum*	*Mytilus edulis*	*Peringia ulvae*	*Potamopyr-gus antipodarum*	*Amphibalanus improvisus*	*Corophium volutator*	*Cyathura carinata*	*Diastylis rathkei*	
1	+	+	+		+	+	+			+			+			8
2	+	+	+	+	+	+	+	+		+			+	+		11
3	+	+	+	+	+	+	+	+		+			+			10
4	+	+	+		+	+	+	+		+			+			9
5	+	+	+	+	+	+	+	+		+			+			10
6	+	+	+		+	+	+	+	+	+	+	+	+		+	13
7	+	+	+			+	+	+	+	+		+	+		+	11
8	+	+	+		+	+	+	+		+			+	+	+	11
9	+	+	+			+	+	+		+			+	+		9
10	+	+	+	+	+	+	+	+		+			+			10
11	+	+	+		+	+	+	+		+			+	+		10
12		+	+			+	+	+		+			+	+		8
13	+	+	+		+	+	+	+		+			+	+		10
14	+	+	+		+	+	+	+		+		+	+			10

Table 24 Abundance of benthic macrofauna (individuals·m^{-2}) at individual study sites during autumn

Nr stanowiska	*Annelida*					*Mollusca*						*Artropoda: Crustacea*				Łącznie na stanowisku
	Clitellata	*Polychaeta*				*Bivalvia*				*Gastropoda*		*Maxillopoda*	*Malacostraca*			
													Amphipoda	*Isopda*	*Cumacea*	
	Oligochaeta	*Marenzelleria neglecta*	*Hediste diversicolor*	*Streblospio shrubsoli*	*Pygospio elegans*	*Mya arenaria*	*Macoma balthica*	*Cerastoderma glaucum*	*Mytilus edulis*	*Peringia ulvae*	*Potamopyrgus antipodarum*	*Amphibalanus improvisus*	*Corophium volutator*	*Cyathura carinata*	*Diastylis rathkei*	
1	63	200	160	0	6	16	103	0	0	2483	0	0	16	0	0	3047
2	516	100	276	16	6	226	180	20	0	5940	0	0	300	3	0	7583
3	186	256	173	6	13	43	106	16	0	170	0	0	220	0	0	1189
4	266	153	103	0	3	383	233	33	0	5426	0	0	560	0	0	7160
5	123	236	46	6	46	86	160	33	0	1916	0	0	266	0	0	2918
6	530	180	70	0	26	26	646	33	3	2083	26	*	840	0	3	4466
7	410	143	36	0	0	30	900	6	3	3200	0	*	713	0	16	5457
8	83	200	120	0	40	23	73	13	0	666	0	0	113	3	3	1337
9	183	66	226	0	0	260	156	6	0	4290	0	0	506	3	0	5696
10	216	186	96	6	13	146	183	63	0	2806	0	0	963	0	0	4678
11	290	93	176	0	10	260	86	156	0	3280	0	0	773	6	0	5130
12	0	83	180	0	0	10	83	13	0	196	0	0	993	90	0	1648
13	30	223	146	0	20	246	256	83	0	1620	0	0	793	13	0	3430
14	223	126	176	0	16	360	390	66	0	5973	0	*	530	0	0	7860

* the presence of the taxon was found on representatives of Mollusca: M. edulis and C. glaucum

Table 25 Benthic macrofauna biomass (g·m-2) at individual study sites during autumn

Nr stanowiska	*Annelida*					*Mollusca*						*Artropoda: Crustacea*				Łącznie na stanowisku
	Clitellata	*Polychaeta*				*Bivalvia*				*Gastropoda*		*Maxillopoda*	*Malacostraca*			
													Amphipoda	*Isopda*	*Cumacea*	
	Oligochaeta	*Marenzelleria neglecta*	*Hediste diversicolor*	*Streblospio shrubsolii*	*Pygospio elegans*	*Mya arenaria*	*Macoma balthica*	*Cerastoderma glaucum*	*Mytilus edulis*	*Peringia ulvae*	*Potamopyrgus antipodarum*	*Amphibalanus improvisus*	*Corophium volutator*	*Cyathura carinata*	*Diastylis rathkei*	
1	0,0644	2,2420	2,9881	0,0000	0,0050	4,3620	23,1761	0,0000	0,0000	8,6804	0,0000	0,0000	0,0076	0,0000	0,0000	41,5256
2	0,3767	0,4436	2,4747	0,0054	0,0049	9,4337	13,2707	11,3425	0,0000	21,4681	0,0000	0,0000	0,4538	0,0085	0,0000	59,2826
3	0,2982	2,7971	0,9004	0,0094	0,0197	10,0641	36,1983	7,8358	0,0000	0,5794	0,0000	0,0000	0,4713	0,0000	0,0000	59,1738
4	0,2696	0,6713	1,5432	0,0000	0,0005	13,5444	36,6935	20,3159	0,0000	16,9952	0,0000	0,0000	1,3451	0,0000	0,0000	91,3787
5	0,0840	2,2002	0,3320	0,0125	0,0237	6,5055	46,7894	5,2339	0,0000	7,4324	0,0000	0,0000	0,7016	0,0000	0,0000	69,3152
6	0,4469	0,8710	0,8810	0,0000	0,0164	3,7527	39,4629	17,8801	0,1051	8,1412	0,3279	*	1,4171	0,0000	0,0351	73,3375
7	0,3860	0,3389	0,6698	0,0000	0,0000	2,8688	41,5890	3,5645	0,0324	7,5949	0,0000	*	1,1848	0,0000	0,1870	58,4161
8	0,1074	1,8148	1,8180	0,0000	0,0788	1,1207	37,1188	3,3828	0,0000	2,4224	0,0000	0,0000	0,2423	0,0303	0,0393	48,1756
9	0,2214	0,2088	3,0383	0,0000	0,0000	8,9168	16,3566	4,2074	0,0000	17,4865	0,0000	0,0000	1,1649	0,0038	0,0000	51,6046
10	0,5734	1,5366	9,0571	0,0057	0,0155	13,7052	28,5124	21,9893	0,0000	10,0141	0,0000	0,0000	2,4512	0,0000	0,0000	87,8605
11	0,2112	0,8082	1,8227	0,0000	0,0046	20,1598	8,0840	44,1530	0,0000	12,6500	0,0000	0,0000	1,3887	0,0182	0,0000	89,3005
12	0,0000	1,0876	4,4133	0,0000	0,0000	3,3450	30,2665	10,8693	0,0000	0,7696	0,0000	0,0000	2,0889	0,5541	0,0000	53,3944
13	0,0238	3,5340	6,0462	0,0000	0,0108	38,8245	97,0742	10,9206	0,0000	6,6018	0,0000	0,0000	1,7473	0,0772	0,0000	164,8603
14	0,2235	0,3227	2,1448	0,0000	0,0078	19,1368	38,6405	28,8107	0,0000	20,5256	0,0000	*	1,0417	0,0000	0,0000	110,8540
	* obecność taksonu stwierdzono na innym hydrobioncie; biomasa została określona łącznie i przypisana do odpowiedniego przedstawiciela Mollusca															

At the study sites (1-14) (currently existing track and planned widening), the taxonomic composition of the benthofauna was similar, typical of soft sediments (sandy and sandy-muddy). Differential species occurred in the area in low abundance (single individuals). Both abundance and biomass of macroinvertebrates were higher at sites located in the axis of the currently existing harbour access track. To a large extent, the differences are due to the larger proportion of *Bivalvia* representatives. Mean values of benthofauna abundance and biomass for each study site are shown in the figures below.

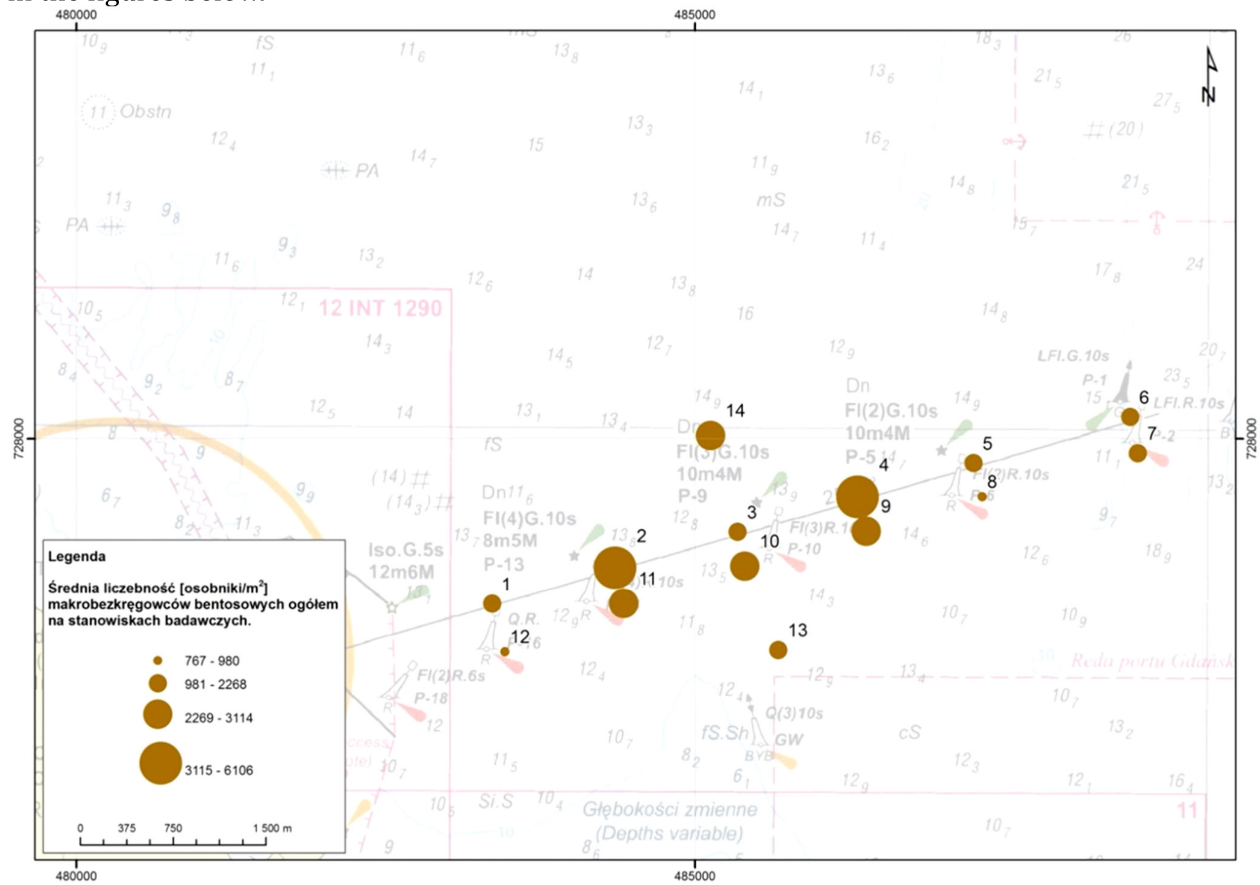

Figure 57 Mean abundance of benthic macroinvertebrates (individuals * m^{-2}) at individual test sites
(source: Transprojekt Gdański Sp. z o.o.)

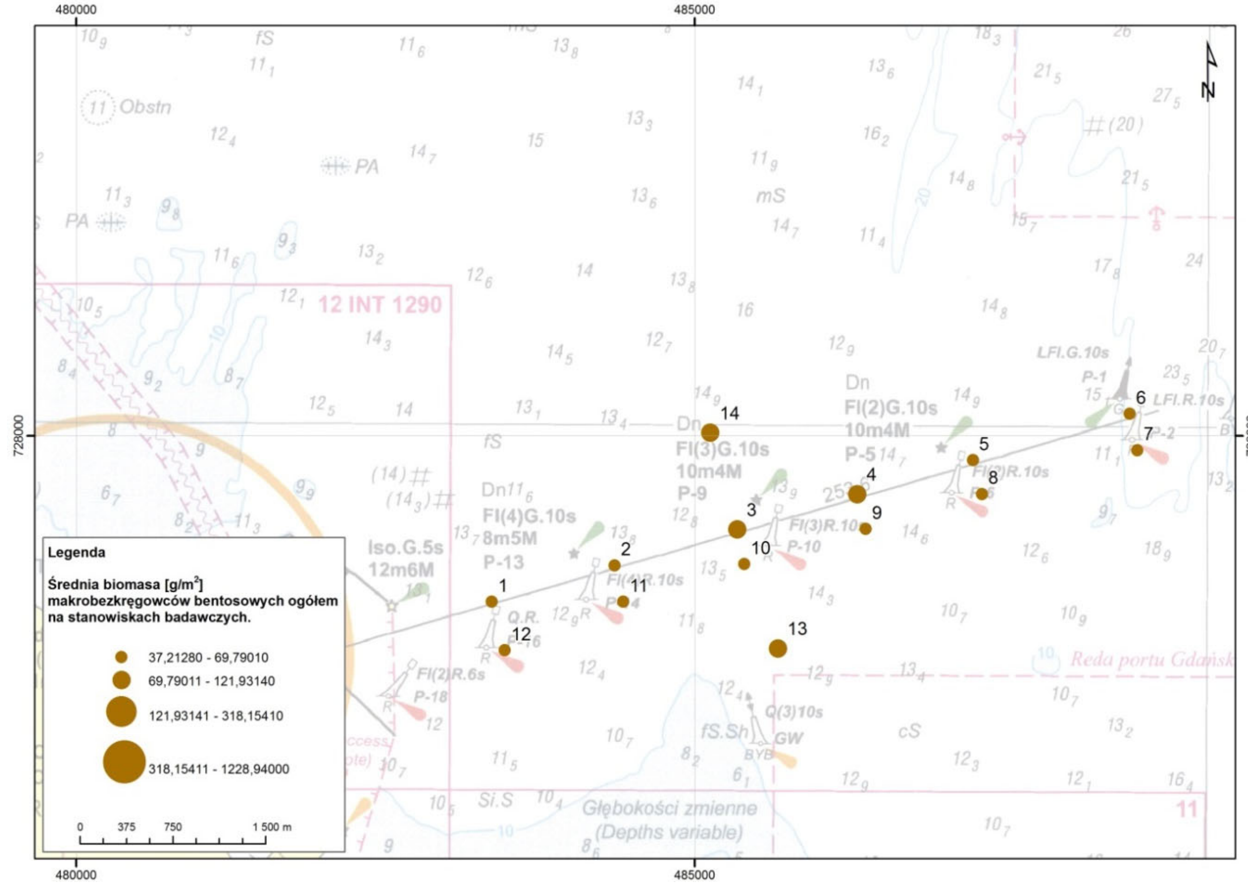

Figure 58 Mean benthic macroinvertebrate biomass (g*m^{-2}) at each test site
(source: Transprojekt Gdański Sp. z o.o.)

During the spring period, representatives of 15 species of benthic macroinvertebrates and the suborder *Oligochaeta* were identified in the collected material. Benthic invertebrate abundance at each site ranged from 416 to 2477 individuals per square meter (tables above), and biomass ranged from 15.92 to 143.79 grams of formalin wet weight (f.w.m.) per square meter of bottom area, respectively (tables above). The averaged values (arithmetic mean) were 1782 individuals and 74.62 grams m.m.f. per square meter in the approach fairway and 864 individuals and 44.95 grams m.m.f. per square meter in the planned widening, respectively. Both abundance and biomass of benthofauna were higher at sites located in the axis of the currently operating approach fairway.

During the summer, the collected material identified the presence of *Maxillopoda* with *Amphibalanus* the only representative of 14 species of benthic macroinvertebrates and the suborder *Oligochaeta*. Benthic invertebrate abundance at each site ranged from 290 to 2597 individuals per square meter (tables above), and biomass ranged from 20.29 to 103.47 grams of formalin wet weight (f.w.m.) per square meter of bottom area, respectively (tables above). The averaged values (arithmetic mean) were 1647 individuals and 51.85 grams m.m.f. per square meter in the approach fairway and 1062 individuals and 50.50 grams m.m.f. per square meter in the planned widening, respectively. Benthofauna abundance was higher at sites located in the axis of the currently operating approach fairway, while biomass reached similar values in both studied transects and was lower than that recorded at lateral control stations.

In autumn, representatives of 14 species of benthic macroinvertebrates and the suborder *Oligochaeta* were identified in the collected material. Benthic invertebrate abundance at each site ranged from 1189 to 7860 individuals per square meter (tables above), and biomass ranged from

41.53 to 164.86 grams of formalin wet weight (f.w.m.) per square meter of bottom area, respectively. The averaged values (arithmetic mean) were 4394 individuals and 65.67 grams m.m.f. per square meter in the approach fairway and 3991 individuals and 64.79 grams m.m.f. per square meter in the planned widening, respectively.

In both transects surveyed (currently existing track and planned widening), the taxonomic composition of the benthofauna was similar, typical of soft sediments (sandy and sandy-muddy). Differential species occurred in low abundance and were represented by single individuals. The abundance and biomass of benthofauna during spring and summer were similar. An increase in the values of both parameters was observed in autumn. This was mainly due to an increase in the contribution of *Gastropoda* to the abundance and *Bivalvia* to the biomass of the bottom zoocenosis. Also, the spatial variability in biomass size was largely due to the different proportion of *Bivalvia* representatives.

In the collected material at study points 15-29, 12 benthic macrofaunal taxa were determined: bivalves *Cerastoderma glaucum*, *Macoma balthica* and *Mya arenaria*; crustaceans *Balanus improvisus*, *Cyathura carinata*, *Rhitropanopeus harrisii*, and *Corophium spp.*; polychaetes *Hediste diversicolor*, *Marenzelleria neglecta* and *Pygospio elegans*; and *oligochaetes (Oligochaeta*). The structure of the benthic macrofauna was similar at all analysed study sites.

Most of the tagged taxa were classified as absolute permanent taxa. The remaining taxa were classified as accessory and incidental taxa. The mean macrozoobenthos abundance was 7267 individuals·m^{-2}, including the abundance of snails of the genus *Hydrobia* 5076 individuals·m^{-2}. The average biomass was 167.68 g wet weight ·m^{-2}. The main contribution to biomass formation came from the bivalve *Mya arenaria* (41%) and other species of bivalves and snails of the genus *Hydrobia*.

Table 26 Mean abundance (N 'm^{-2}, where N - number of individuals) and macrozoobenthic biomass (g w.m m^{-2}, where w.m. - wet mass) and the values of indices determining the role of particular taxa in the studied biocenosis (%)

Taxon	Constancy index C	Abundance	Dominance index D for abundance	Biomass	Dominance indicator D for biomass
Ologochaeta	60	21	0	0.01	0
Hediste diversicolor	100	323	4	6.92	4
Marenzelleria neglecta	100	228	3	2.36	1
Pygospio elegans	27	13	0	0.01	0
Balanus improvisus	40	-	-	-	-
Cyathura carinata	27	4	0	0.03	0
Corophium spp.	93	1025	14	2.80	2
Rhitropanopeus harrisii	13	1	0	0.24	0
Hydrobia spp.	100	5076	70	18.26	11
Cerastoderma glaucum	73	162	2	34.88	21
Macoma balthica	100	133	2	32.66	19
Mya arenaria	100	282	4	69.52	41

Table 27 Abundance (N·m^{-2}, where N - number of individuals) and biomass of individual macrofaunal taxa (g w.m.·m^{-2}, where w.m. - wet mass) at the analysed test sites

Nr st.	*Cerastoderma glaucum*		*Macoma balthica*		*Mya arenaria*		*Corophium spp.*		*Cyathura carinata*		*Rhithropanopeus harrisii*		*Hediste diversicolor*		*Marenzelleria neglecta*		*Pygospio elegans*		*Oligochaeta*		*Hydrobia spp.*	
	N	g m.m.	N	g m.m.	N	g m.m.	N	g m.m.	N	g m.m.	N	g m.m.	N	g m.m.	N	g m.m.	N	g m.m.	N	g m.m..	N	g m.m.
1	140	31,30	140	34,83	30	1,31	450	1,47	0	0,00	10	0,10	390	3,94	50	0,19	0	0,00	0	0,00	4990	16,16
2	560	103,50	100	21,55	200	46,26	1350	3,15	0	0,00	0	0,00	350	2,09	120	0,76	20	0,05	10	0,01	8440	29,76
3	350	86,72	210	54,77	380	55,43	1960	4,37	20	0,24	0	0,00	360	2,78	260	1,44	10	0,00	10	0,01	8810	28,00
4	110	20,17	260	35,30	340	76,42	1150	3,46	10	0,02	10	3,52	400	14,23	80	1,03	0	0,00	0	0,00	3740	13,88
5	210	32,91	280	53,20	1460	325,36	540	1,29	0	0,00	0	0,00	300	8, II	20	0,01	0	0,00	20	0,01	12930	41,38
6	0	0,00	40	24,11	60	20,65	50	0,09	0	0,00	0	0,00	100	3,00	800	9,81	0	0,00	0	0,00	40	0,24
7	0	0,00	60	35,71	40	7,55	80	0,29	0	0,00	0	0,00	130	4,59	400	5,96	0	0,00	0	0,00	1340	4,95
8	10	1,87	70	6,66	30	0,18	2510	5,48	10	0,03	0	0,00	280	10,75	20	0,03	10	0,01	30	0,02	4910	16,19
9	80	16,19	110	31,39	30	2,97	990	3,49	0	0,00	0	0,00	390	4,50	50	0,07	0	0,00	30	0,01	6850	24,01
10	0	0,00	60	0,60	80	16,50	840	2,34	0	0,00	0	0,00	280	6,63	10	0,02	0	0,00	0	0,00	9850	49,65
II	350	102,52	150	68,82	30	15,27	1090	3,86	0	0,00	0	0,00	530	3,63	160	0,71	0	0,00	10	0,00	4620	14,51
12	500	114,96	340	79,24	740	328,67	3280	8,00	20	0,10	0	0,00	980	15,20	300	3,18	160	0,13	130	0,06	7940	27,41
13	110	4,92	10	3,54	210	21,46	180	3,04	0	0,00	0	0,00	190	7,00	500	5,44	0	0,00	20	0,01	670	3,29
14	10	8,13	150	33,90	520	106,06	900	1,72	0	0,00	0	0,00	150	9,62	340	2,33	0	0,00	0	0,00	920	4,14
15	0	0,00	10	6,24	80	18,68	0	0,00	0	0,00	0	0,00	10	7,70	310	4,37	0	0,00	50	0,02	90	0,34

Based on the results of the research carried out in the vicinity of the planned investment, representatives of benthofauna associated with the *Macoma balthica* and *Mytilus edulis* complexes were found. The taxonomic composition is typical of the shallow to mid-depth bottom zone (Demel and Mankowski, 1951; Warzocha 1995). Excluding mussel colonies, there is a similarity in taxonomic composition with respect to the benthofauna inhabiting the area from which sediments are to be removed and the area of planned spoil disposal. It should be emphasized that single specimens of mussels were also found in the area of the currently functioning track and in the area of its planned extension, while their presence was not found in the immediate vicinity of the investment in question or in the areas intended for the construction of breakwaters with fairways.

According to data presented by Piesik et al. (2009), the average density of mussels in the Gdańsk Bay is less than one individual per square meter, with a maximum density of 10 individuals·m^{-2}. The numbers found in the proposed project area are similar.

According to the "Atlas of Seabed Habitats of the Polish Marine Areas" (2009), the character of seabed sediments in the western part of the Gulf of Gdańsk and the planned reservoirs is similar. Sources of literature (Wenne and Wiktor 1982, Wiktor 1990, Atlas of habitats of the bottom of Polish marine areas. The natural valorization of marine habitats. 2009) indicate a similar distribution of mussels in the Gulf of Gdańsk region at different times. Also in 2014, biomass and its distribution did not differ from the multi-year period (J. Warzocha, oral information).

It is also noteworthy that among the mussels, in addition to native species, invasive taxa also find favourable living conditions - including the American crab *(Rhithropanopeus harrisie*), whose presence has been confirmed in the area of planned reservoirs. This species is listed in the *HELCOM Guide to Alien Species and Ballast Water Management in the Baltic Sea* (2014). Mussel colonies are also a convenient habitat for another invasive species, the bullhead goby *(Neogobius melanostomus*), (Leather, Butcher, 2001), which is also included in the HELCOM study mentioned above.

Based on the results obtained, it can be concluded that the nature of the biocenosis in the area of the planned project is characterized by a moderate/low degree of biodiversity. No protected species or habitats were found. Opportunistic species with a wide range of tolerance to varying or changing environmental conditions were found among the dominant organisms in terms of abundance and biomass.

6.6.1.2Ichthyofauna

In the study area, which includes two survey transects (cf. Chapter 1.4). There were 18 species of fish reported in the groundfish, pelagic, and salmon net fisheries (see table below)

Table 28 Fish species found at each transect
(Source: based on Transprojekt Gdański Sp. z o.o.).

English name	Latin name	Transect 1	Transect 2
round goby	Neogobius melanostomus	X	X
garfish	Belone belone	X	X
certa	Vimba vimba	X	X
sandeel	Hyperoplus lanceolatus	X	X
cod	Atlantic cod	X	X
plaice	Pleuronectes platessa	X	X
shortnose sturgeon	Acipenser oxyrinchus	X	X
sculpin	Myoxocephalus scorpius	X	X
perch	Perca fluviatilis	X	X
twaite shad	Alosa fallax	X	X

English name	Latin name	Transect 1	Transect 2
pikeperch	Sander lucioperca	X	X
flounder	Platichthys flesus	X	X
smelt	Osmerus eperlanus	X	X
sprat	Sprattus	X	X
herring	Clupea harengus	X	X
trout	Salmo trutta	X	X
turbot	Scophthalmus maximus	X	X
eel	Zoarces viviparus	X	X

Transect 1

Located near the proposed development, within walking distance of the shoreline and harbour defense structures. During the study, 4295 fish were caught, with flounder accounting for as much as 70% of the numerical turnout and 78% of the weight. Other species were much less abundant, including mainly herring, perch, bullhead goby, and juvenile cod. A protected parakeet has also been recorded.

Table 29 Abundance and weight along with individual fish frequency recorded in pelagic, groundfish and salmon fisheries in transect 1

(Source: based on Transprojekt Gdański Sp. z o.o.).

Species	Quantity (pieces)	Turnout (%)	Weight [g]	Turnout (%)
flounder	3003	69.9%	411447	77.6%
perch	317	7.4%	29317	5.5%
cod	274	6.4%	30116	5.7%
herring	216	5.0%	17814	3.4%
round goby	170	4.0%	10816	2.0%
sprat	148	3.4%	1361	0.3%
smelt	60	1.4%	2445	0.5%
pikeperch	46	1.1%	13452	2.5%
sandeel	18	0.4%	465	0.1%
certa	15	0.3%	4297	0.8%
turbot	9	0.2%	1227	0.2%
garfish	8	0.2%	3680	0.7%
plaice	5	0.1%	428	0.1%
sturgeon	1	0.0%	520	0.1%
bull-rout	1	0.0%	205	0.0%
twaite shad	1	0.0%	237	0.0%
trout	1	0.0%	1370	0.3%
eel	1	0.0%	170	0.0%
sturgeon	1	0.0%	611	0.1%
Total	4295	100.0%	529977.5	100.0%

Transect 2

Located approximately 3.5 km from the proposed development. A total of 2229 fish were caught in the nets used at this study station with flounder clearly dominant (64% by abundance and 77% by weight).

Other species include sprat, cod, herring and smelt, and in small amounts the other species listed in the table below. Similar to transect 1, a catch of protected parakeet was recorded.

Table 30 Abundance and weight along with individual fish frequency recorded in pelagic, groundfish and salmon fisheries in transect 2

(Source: based on Transprojekt Gdański Sp. z o.o.).

Species	Quantity (pieces)	Turnout (%)	Weight [g]	Turnout (%)
flounder	1435	64.4%	185631.1	77.0%
sprat	241	10.8%	2174.7	0.9%
cod	207	9.3%	24165.2	10.0%
herring	145	6.5%	11211.3	4.7%
smelt	100	4.5%	2864	1.2%
sandeel	34	1.5%	1620.8	0.7%
round goby	17	0.8%	892	0.4%
turbot	11	0.5%	1702	0.7%
perch	10	0.4%	1068	0.4%
garfish	8	0.4%	1737	0.7%
pikeperch	8	0.4%	5411.4	2.2%
plaice	4	0.2%	165	0.1%
twaite shad	2	0.1%	537	0.2%
trout	2	0.1%	1262	0.5%
eel	2	0.1%	185	0.1%
herring	2	0.1%	196.2	0.1%
sculpin	1	0.0%	110	0.0%
Total	2229	100.0%	240932.7	100.0%

Characteristics of selected fish species

Length analysis of selected species (most abundant in each transect) was performed for comparison between transects. Results of age analyses and other biological parameters collected throughout the study cycle are also presented. A brief description is included below for those species whose sample could be considered representative. The remaining species were caught in minimal numbers; therefore, other than abundance, it is difficult to interpret other biological data for these taxa. Standardized yields (kg/h) for major species by transect and season are also presented.

Flounder

During autumn months, flounder were abundant on all survey transects. The length distributions of flounder caught at each station were very similar in both the shape of the length curves and the frequency of flounder abundance in each length class. The fish caught ranged from 7 to 51 cm, with a peak in frequency at 23 - 25 cm. The distribution of age groups showed individuals belonging to 9 age classes with the dominance of group 4 and 5, i.e., adult fish (54%). Juvenile individuals made up 21%. In terms of yield, the highest values were recorded in spring and summer in transect 1 (17 and 12 kg/h, respectively). Productivity decreased in the off-shore direction, except in autumn when it was several times less (2-4 kg/h).

Cod

The length distribution of cod caught in all transects was similar. Captured individuals measured between 11 and 56 cm, with peaks in frequency between 16 and 27 cm (over 76% of total abundance). However, larger fish of interest to the fishery (over 38 cm - only 25 individuals in total) were scarce. Age structure was dominated by 2 year old fish (over 42% of attendance), combining juveniles (age class 1 and 2) made up 61% of the catch. The catch rates of the research nets were relatively low (0 to 3.5 kg/h).

Herring

Individuals measuring between 11 and 33 cm with a peak in frequency of 21-23 cm were found in the survey catch. As with flounder and cod, there were no clear differences between transects. The area of the planned investment is a spawning and feeding ground for herring, but larger spawning concentrations are observed rather in the mouths of the Vistula Śmiała and Martwa rivers. The length distribution of herring caught in September and October indicates that adult populations are present, while juvenile herring were scarce.

The age structure supports the thesis that adult fish dominate, mainly the 8th, 9th and 10th age groups. They accounted for more than 60% of the age turnout. Standardized test network capacities ranged from 0.1 to 2.4 pieces/h.

Sprat

Individuals measuring 7 to 13 cm with a peak in frequency of 11 cm were found in the survey catch. As with flounder and cod, no differences were found between transects. In the case of sprat this spawning takes place in portions, in the first phase deep water, in the second in the surface zone. Rather, the project area is a juvenile stage regrowth site (age group 1 and 2). The yields obtained were very low, ranging from 0 to 2.1 pieces/h.

Sprat

Perch occurrence was mainly limited to transect 1. Fish in the 12-29 cm range were recorded, with peaks at 15 and 21 cm. Both juvenile and adult forms were present in the catch.

Summary

Eighteen fish species were found in the survey catch, of which four (cod, flounder, herring and sprat) are of industrial importance. Two species of protected fish (twait shad, shortnose sturgeon) have also been recorded. In general, the species analysed in the survey catch did not differ in population between transects. Flounder was the clear dominant fish in all zones. In the zone closest to the shore and harbour fortifications, freshwater species associated with the Vistula estuary (chert, perch, zander) were found. Commercially fished, ecosystem important and legally protected species (cod, flounder, herring, sprat, lamprey, goby) were selected for further evaluation.

6.6.1.3Avifauna

Between November 2015 and October 2016, 157,021 birds of 34 species were found during inspections performed for the Gdynia Maritime Authority (Orbital, 2016) (p. figure below).

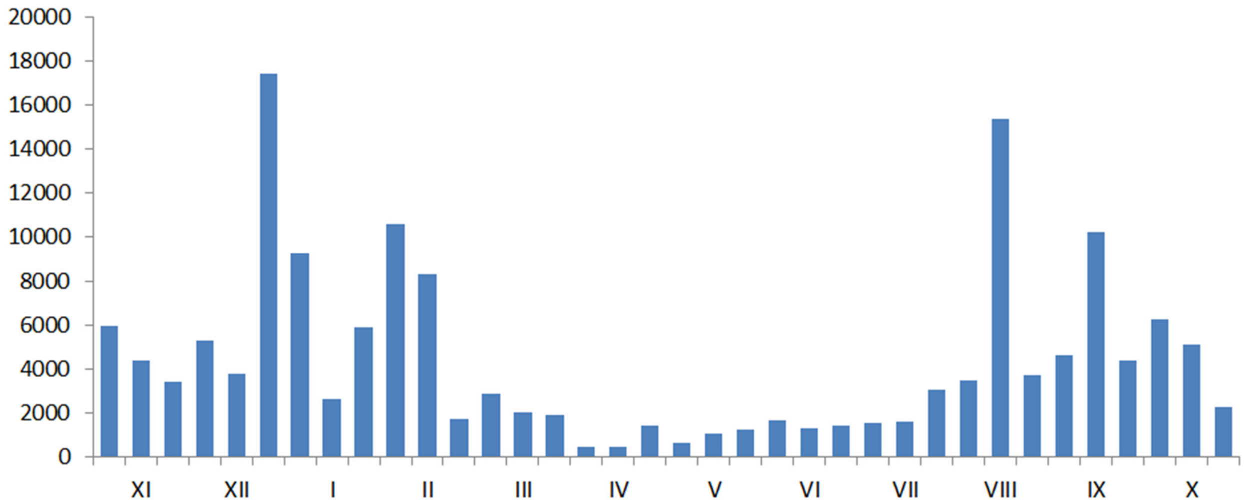

Figure 59 Sum of bird counts at each control in consecutive months.

Bird counts in Port Północny area were characterized by very high dynamics between individual controls. The differences between each successive control were sometimes 300-400% (Figure 59).

Table 31 Maximum numbers of waterbirds found in the Port of Gdańsk and adjacent areas *(source: Orbital 2016)*

No.	Species	Maximum number per one control	Total birds (all controls)	Frequency (% of counts where the species was found)
1	Great Crested Grebe / Podiceps cristatus	699	8,710	86 %
2	Grebe / Tachybaptus ruficolis	1	4	11 %
3	Horned grebe / Podiceps auritus	9	33	19 %
4	Grebe / Podiceps nigricolis	4	16	14 %
5	Grey Heron / Ardea cinerea	48	274	64 %
6	Cormorant / Phalacrocorax carbo	7,908	47,348	100 %
7	Mute Swan / Cygnus olor	169	1,953	100 %
8	Whooper swan / Cygnus cygnus	3	3	3 %
9	Common shelduck / Tadorna tadorna	4	6	6 %
10	Goose / Anser anser	1	4	11 %
11	White-fronted Goose / Anser albifrons	1	1	3 %
12	Bean Goose / Anser fabalis	1	1	3 %
13	Tufted duck / Aythya fuligula	3,454	16,583	89 %
14	Spotted dogfish / Aythya marilla	52	82	11 %
15	Loggerhead shiner / Aytya ferrina	3	4	6 %
16	Long-tale duck / Clangula hyemalis	1,671	10,972	53 %
17	Red kite / Anas strepera	6	6	3 %
18	Pipit / Anas crecca	11	11	3 %
19	Mallard / Anas platyrhynchos	55	279	81 %
20	velvet scoter / Melanitta fusca	210	813	28 %
21	Goldeneye / Bucephala clangula	83	297	44 %
22	Common eider / Someteria mollisima	29	68	28 %
23	Partridge / Mergus merganser	323	2534	97 %
24	Red-breasted merganser / Mergus serrator	9	35	19 %
25	Smew / Mergus albellus	10	48	22 %

No.	Species	Maximum number per one control	Total birds (all controls)	Frequency (% of counts where the species was found)
26	Black-headed gull / Chroicocephalus ridibundus	5,005	9,437	83 %
27	European herring gull	6,688	28,455	100 %
28	Grey Gull / Larus canus	6,031	25,610	78 %
29	Herring gull / Larus marinus	184	1,522	94 %
30	Black-headed Gull / Larus melanocephalus	4	4	3 %
31	Yellow-legged gull / Larus fuscus	2	3	6 %
32	Common Tern / Sterna hirundo	170	874	22 %
33	Sandwich tern / Sterna sandvicensis	1	1	3 %
34	Coot / Fulica atra	160	976	47 %
35	Squeaker / Tringa hypoleucos	5	15	14 %
36	Dunlin / Calidris alpina	8	8	3 %
37	Red-knot / Calidris canutus	9	9	3 %
38	Ruddy turnstone / Arenaria interpres	3	3	3 %
39	Plover / Charadrius hiaticula	5	10	14 %
40	Eurasian curlew / Numenius arquata	3	3	3 %
41	Eurasian curlew / Numenius pheaopus	3	3	3 %
42	Redshank / Tringa totanus	2	2	3 %
43	Plover / Charadrius dubius	1	1	3 %

Birds in the area of the port of Gdańsk were very unevenly distributed. The highest abundances were found in the basin between the ore and gas piers, and on the west side of the fuel pier. Slightly less on the east side of Terminal T 1. Breakwaters, including the Island Breakwater (home to most of the area's cormorants), were also an important site for ornithofauna. This is illustrated in the figures below.

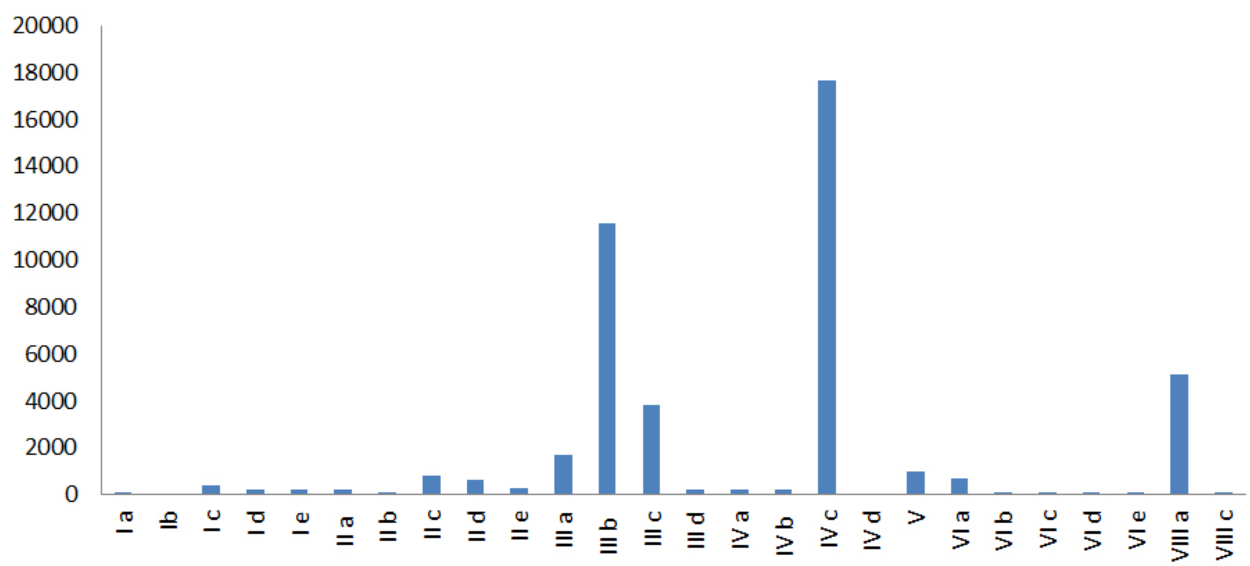

Figure 60 Sum of all birds found in separate areas of the Port of Gdańsk
(a breakdown by area is shown in Figure 5)
(source: Orbital 2016).

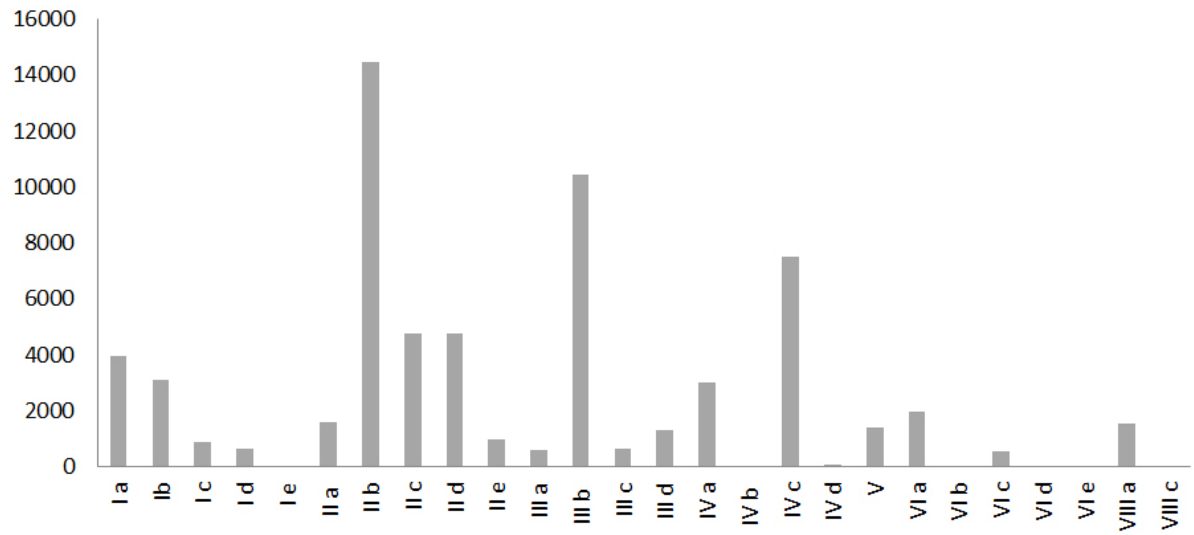

Figure 61 Wetland birds (excluding gulls and cormorants) found in separate areas of the Port of Gdańsk in a yearly cycle
(a breakdown by area is shown in Figure 5)
(source: Orbital 2016).

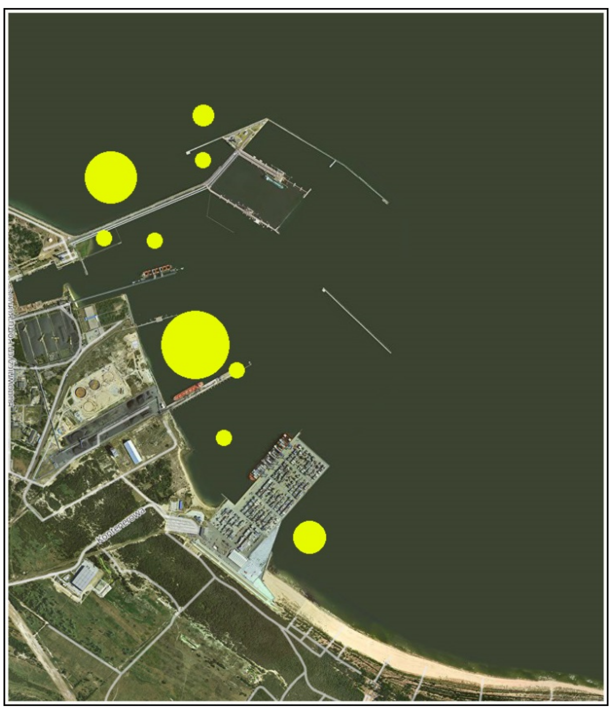

Figure 62 Sites within the port area with the most abundant birds (excluding gulls).

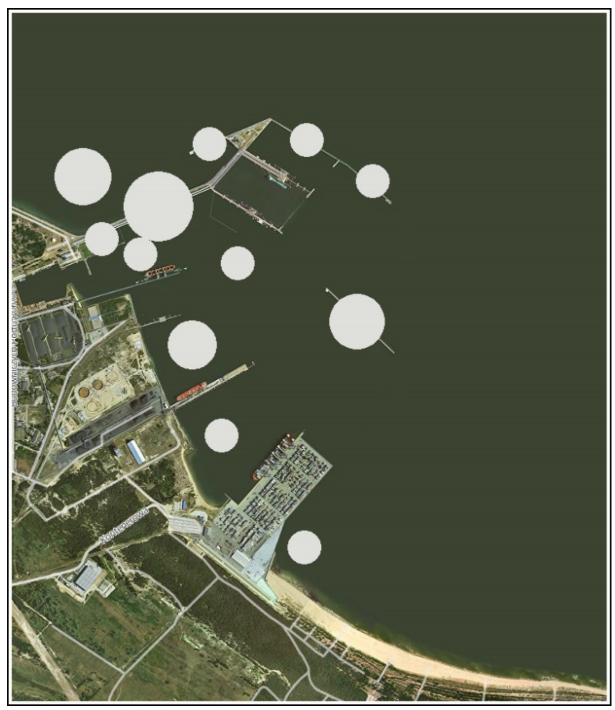

Figure 63 Sites within the harbour with the most abundant gulls.

6.6.1.3.1 Dynamics and occurrence characteristics of selected wetland species

Great **Crested Grebe** *Podiceps cristatus* (No = 8,710 individuals, Ns = 31 records)

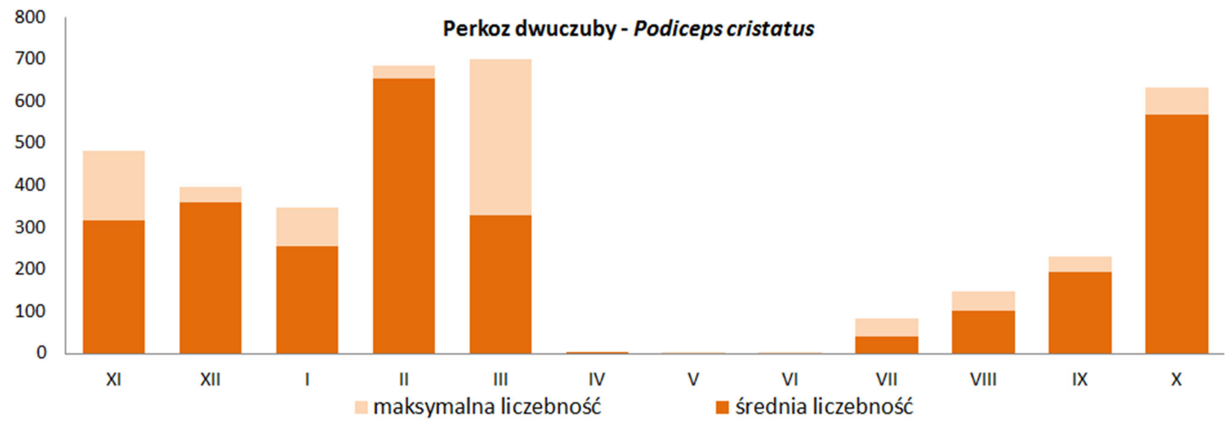

Figure 64 Dynamics of Great Crested Grebe occurrence in a monthly cycle
(source: Orbital 2016)

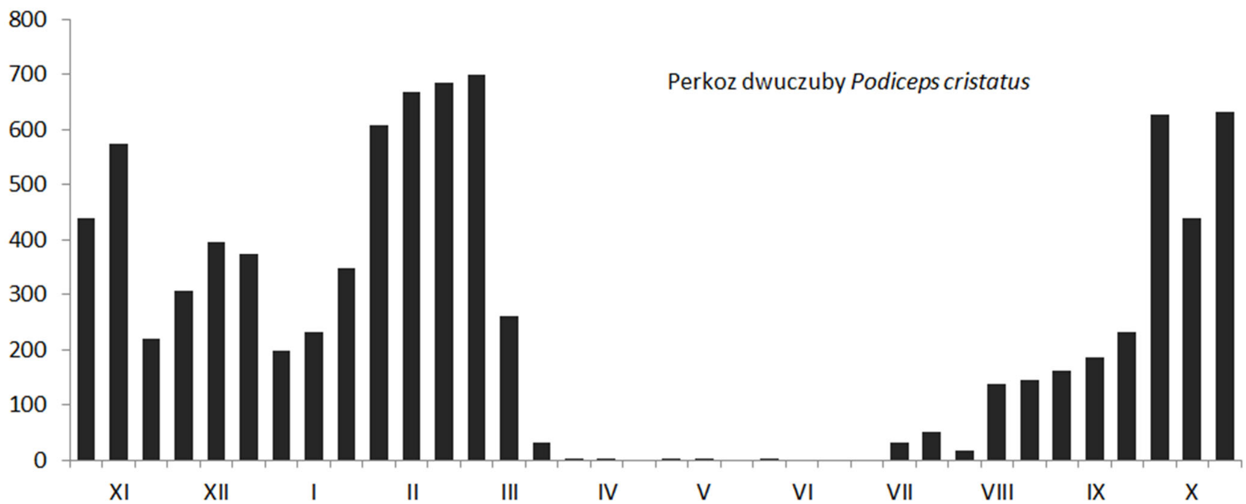

Figure 65 Dynamics of Great Crested Grebe occurrence
(source: Orbital 2016)

Horned grebe Podiceps auritus

A total of 33 birds were recorded in seven encounters (p. figure below). Birds were observed in the inner basins as well as on both sides of the port - at the DCT terminal and the fuel pier. Usually found singly or in groups of up to three birds, much more numerous during spring migration.

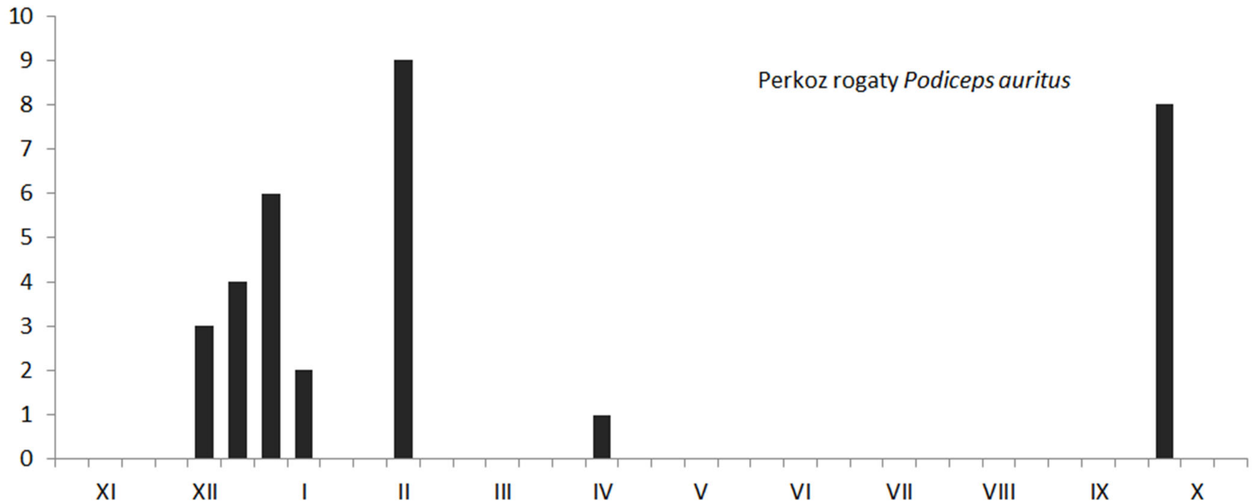

Figure 66 Dynamics of horned grebe occurrence
(source: Orbital 2016).

Grey Heron *Ardea cinerea* (No = 274 individuals, Ns = 23 statements)

Herons were usually in the harbour area during the post-breeding season, although a few individuals were also observed during the breeding season (p. figure below). The birds rested on harbour structures, often accompanied by cormorants. Few also on the beach behind the DCT terminal.

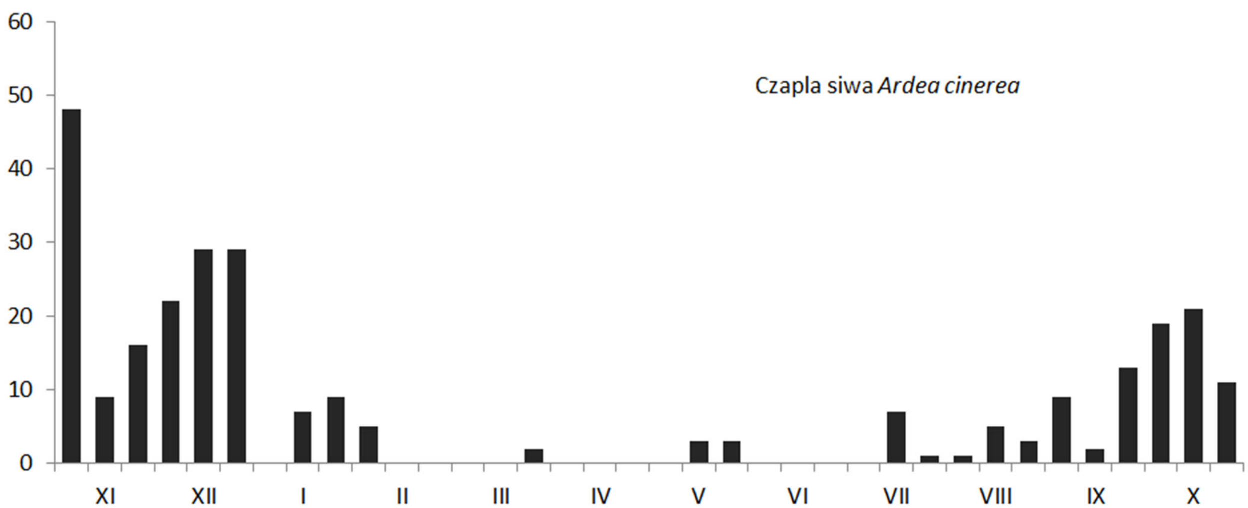

Figure 67 Dynamics of grey heron occurrence
(source: Orbital 2016)

Cormorant *Phalacrocorax carbo* (No = 47,348 individuals, Ns = 36 records)

In the harbour, birds were most often observed resting mainly on the island breakwater and the protective breakwaters of Naftoport. The highest concentration of nearly 8000 individuals was recorded on 29.09.2016. Typically, bird abundance within the harbour increased during the evening hours when cormorants congregated for roosting. Birds were also found resting on the fuel pier, and (although in much lower numbers), feeding in the harbour basins. The most numerous in August and September, in the following months it is much less numerous. This is illustrated in the figures below.

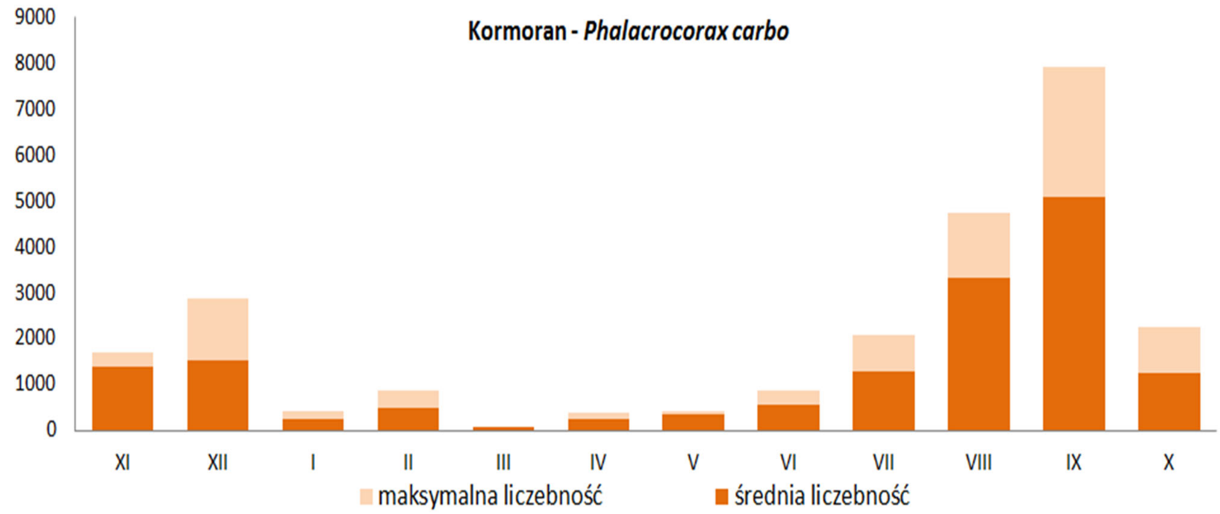

Figure 68 Dynamics of cormorant occurrence on a monthly basis
(source: Orbital 2016).

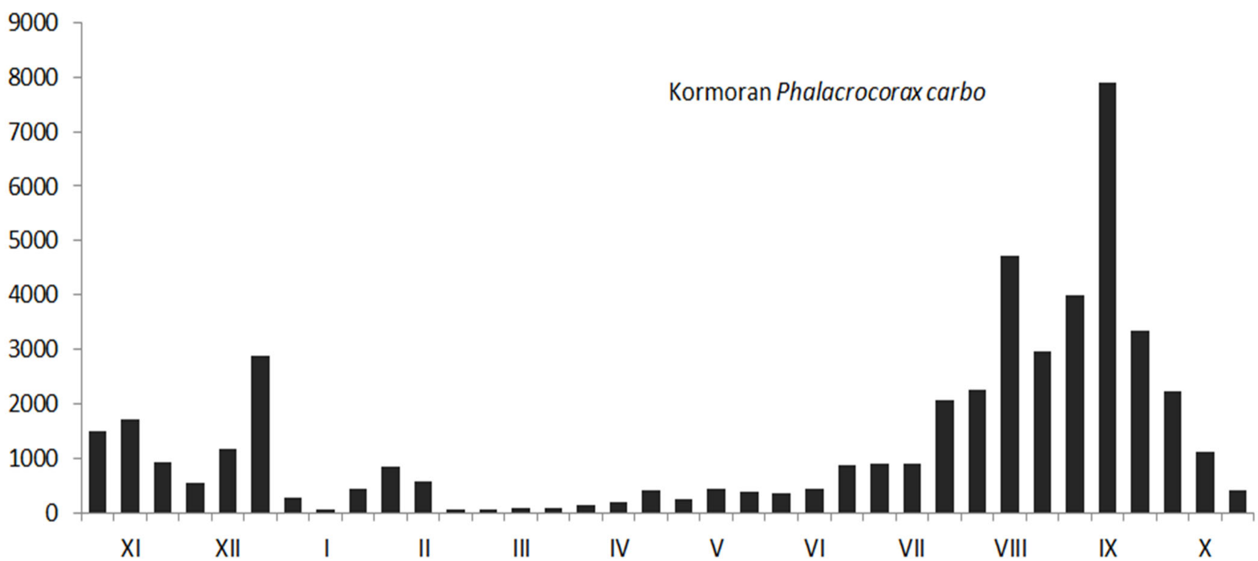

Figure 69 Cormorant dynamics
(source: Orbital 2016).

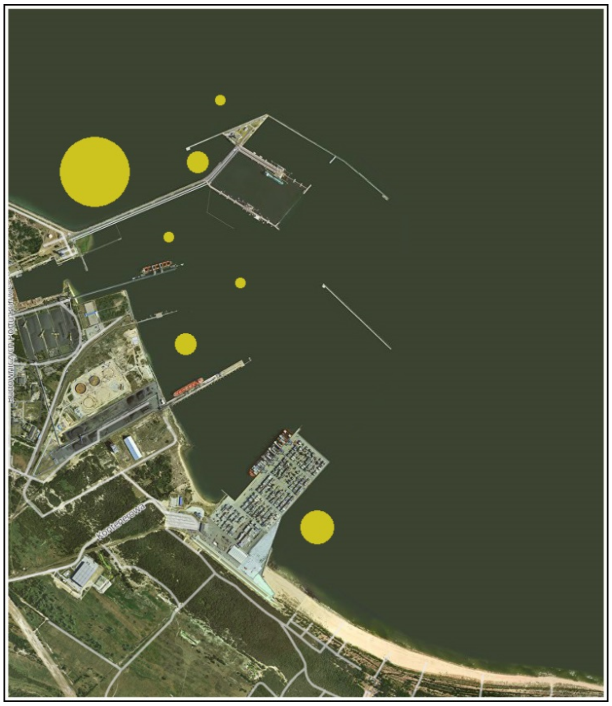

Figure 70 Locations within the harbour with the most abundant occurrence of great crested grebes.

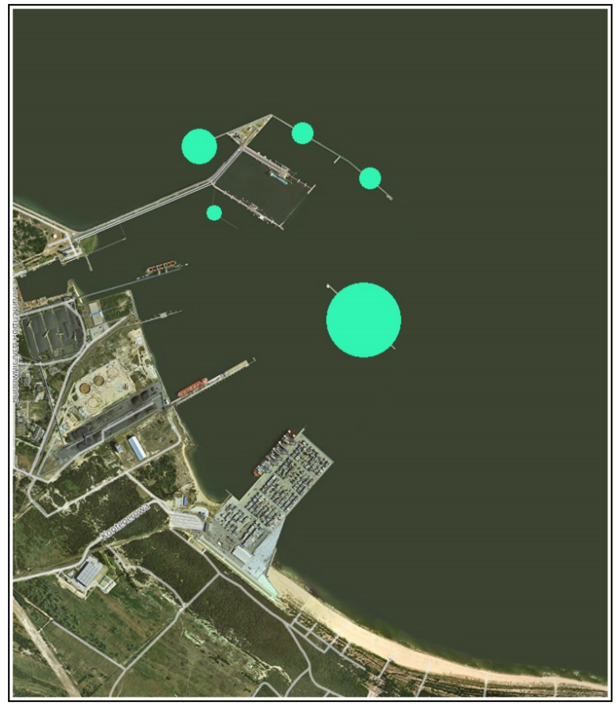

Figure 71 Locations within the port area with the most cormorants.

Mute Swan *Cygnus olor* (No = 1,935 individuals, Ns = 36 records)

A species regularly found in the harbour area. It was least abundant in winter, when about 20 individuals were regularly found (p. figure below). During April-August, there are already regularly more than 60 individuals. The highest number, 169, was recorded in the second decade of August.

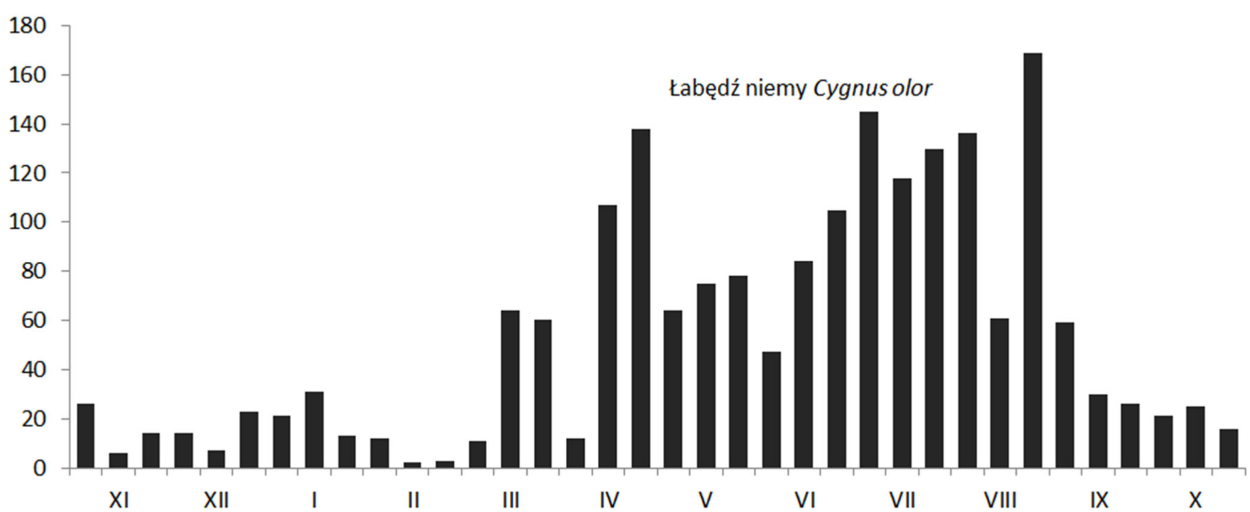

Figure 72 Dynamics of Mute Swans
(source: Orbital 2016).

Tufted Duck *Aythya fuligula* (No = 16,583 individuals, Ns = 32 records)

The most numerous of the diving ducks and one of the most abundant species in the area. Mainly observed in October through January. The species usually forms a dense herd, often reaching numbers in excess of 3,000 individuals. Found virtually exclusively in the basin on the northwest side of the ore pier. From February to the end of September there are only small groups and individuals. Usually observed together with a few partridges, great crested grebes and white-tailed grebes.

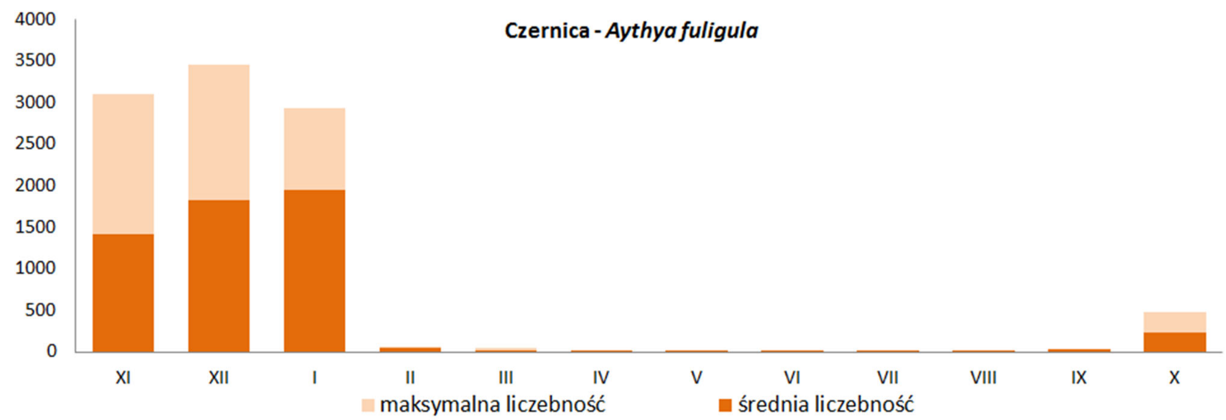

Figure 73 The dynamics of the occurrence of the blacklegs on a monthly basis
(source: Orbital 2016).

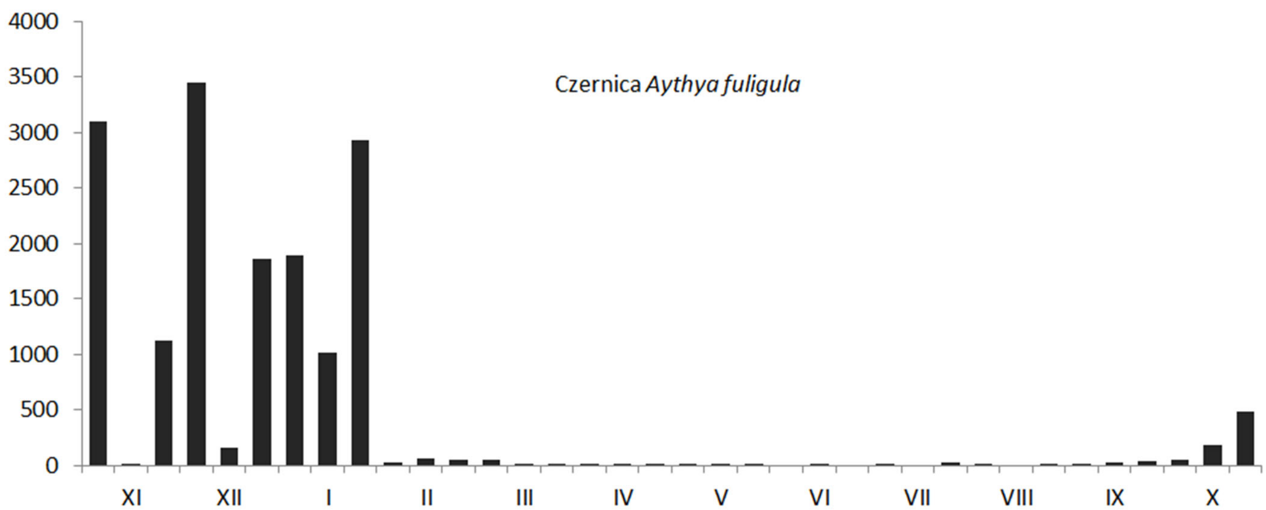

Figure 74 The dynamics of the occurrence of the tufted duck
(source: Orbital 2016).

Sea bream Aythya marilla

During the winter, few birds were found in the wintering flock of tufted ducks. The species was found four times - the most numerous recorded in the third decade of February was 52 birds.

Long-tale duck *Clangula hyemalis* (No = 10,972 individuals, Ns = 19 findings)

The second most abundant duck in the area. Abundantly found in bodies of water bordering the harbour. On more than one occasion, more than 6,000 individuals were present in an area adjacent to 2 km on either side of the harbour (outside the monitored area). Within the study area, counts rarely exceeded 1600 birds. Species abundant until late March. This is illustrated in the figures below.

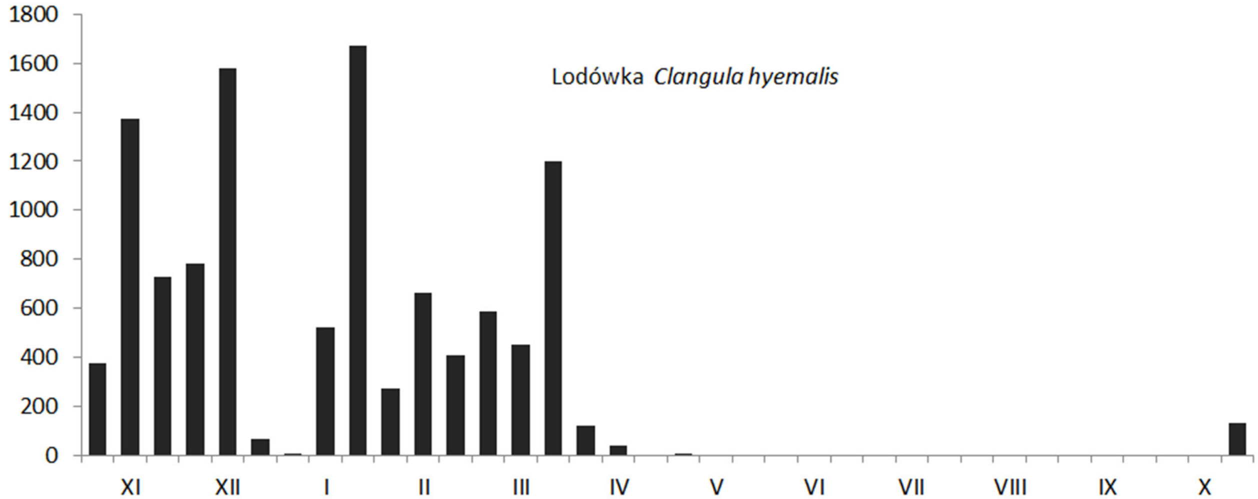

Figure 75 Dynamics of long-tale duck incidence
(source: Orbital 2016).

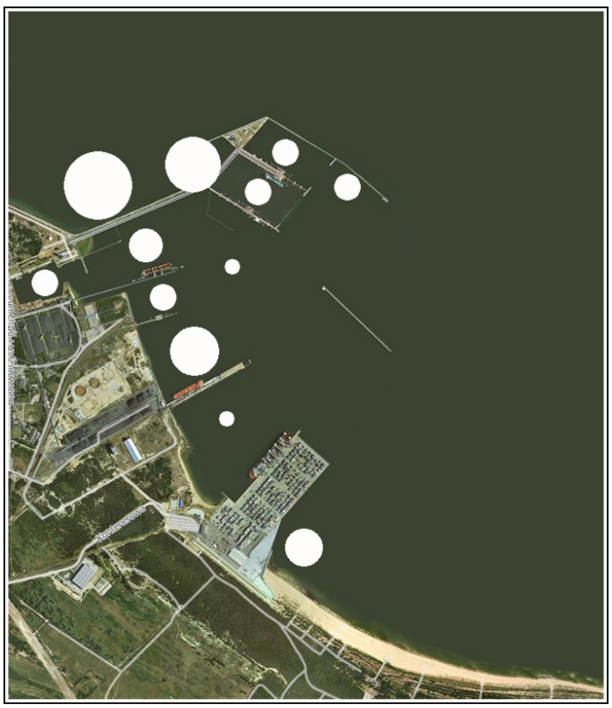

Figure 76 Figure 6. Sites within the harbour with the most abundant occurrence of mute swans.

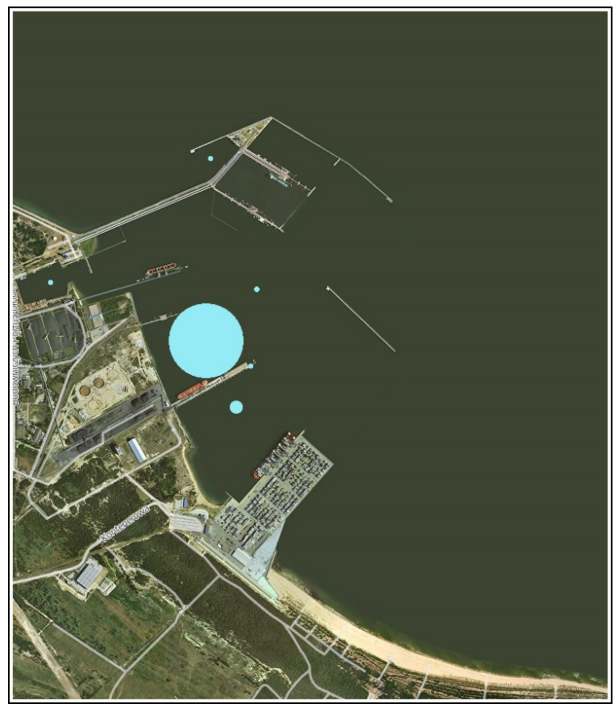

Figure 77 Figure 7. Locations within the harbour with the most abundant occurrence of blackfish.

Mallard *Anas platyrhynchos* (No = 279 individuals, Ns = 29 records)

Species found sparsely throughout the year, only groups of males and single males were observed during the breeding season. The highest number of over 50 birds was recorded in the last days of December.

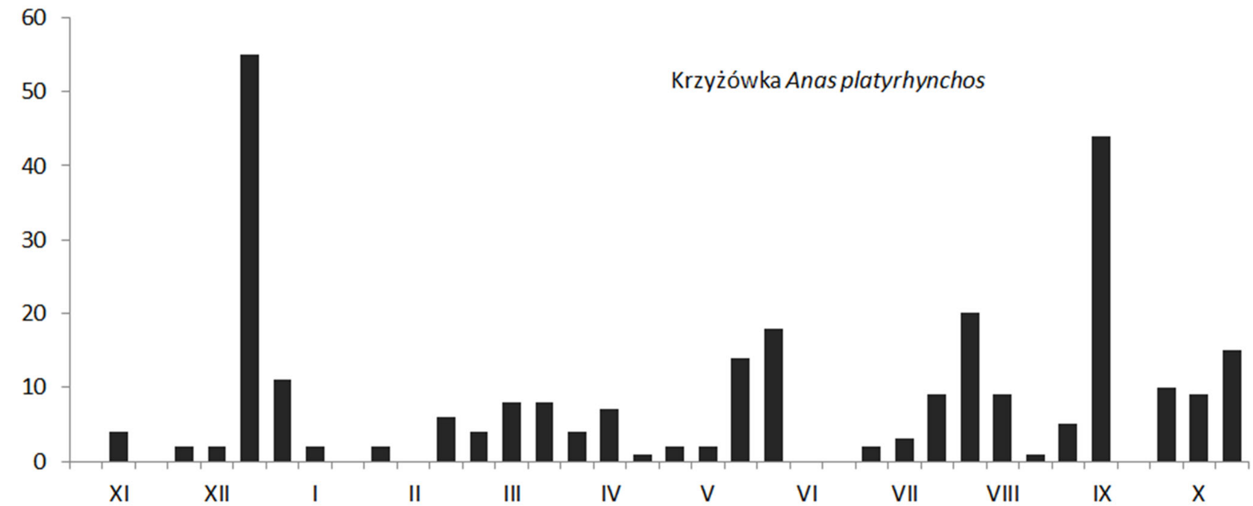

Figure78 The dynamics of crossbreeding
(source: Orbital 2016).

velvet scoter *Melanitta fusca* (No = 813 individuals, Ns = 10 findings)

Observed only during the wintering season. The vast majority of the findings were birds observed on the west side of Naftoport.

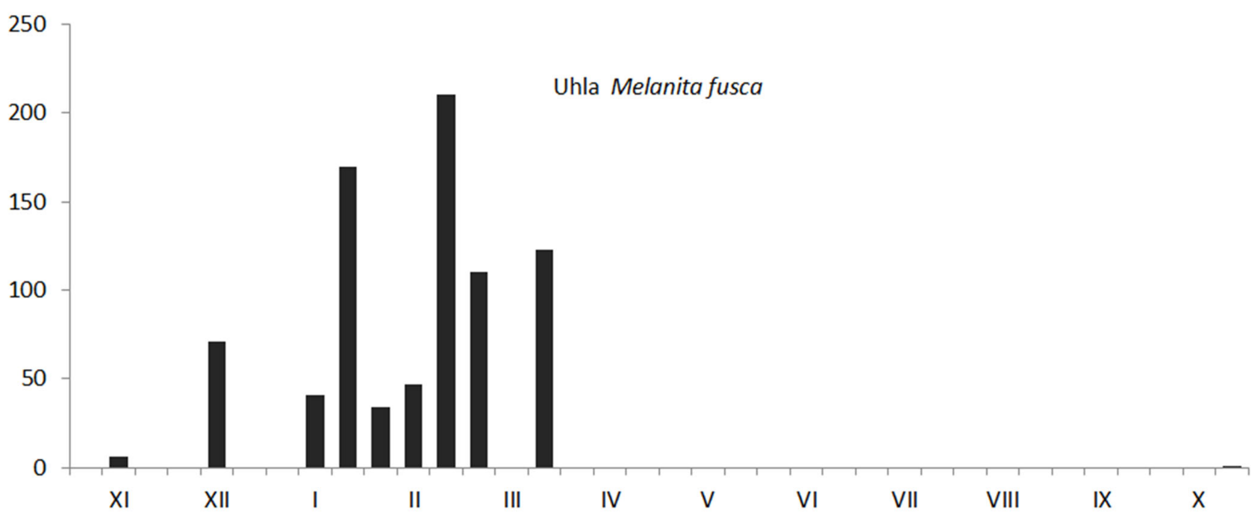

Figure 79 Dynamics of velvet scoter occurrence
(source: Orbital 2016).

Goldeneye *Bucephala clangula* (No = 297 individuals, Ns = 16 observations)

Goldeneyes were recorded sparsely, mostly from January to early March. Most commonly found on the east side of the DCT terminal.

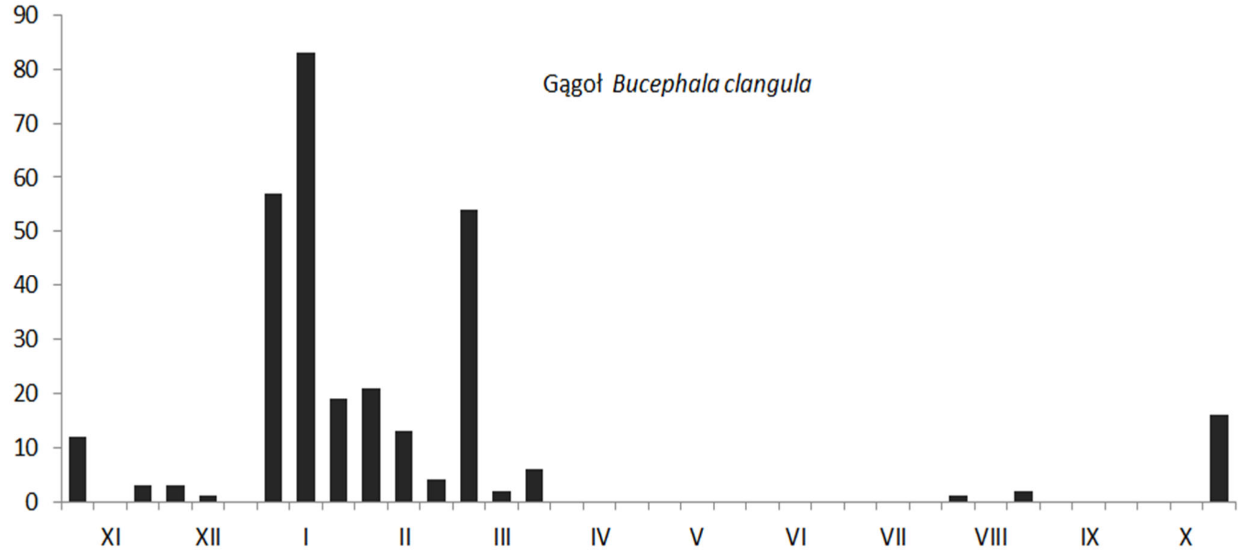

Figure 80 Dynamics of goldeneye occurrence
(source: Orbital 2016).

Common eider Somateria mollisima

Observed very sparsely and irregularly, usually during the winter months. All observations are for the area on the west side from Naftoport. A group of four males was recorded several times in late May and early June.

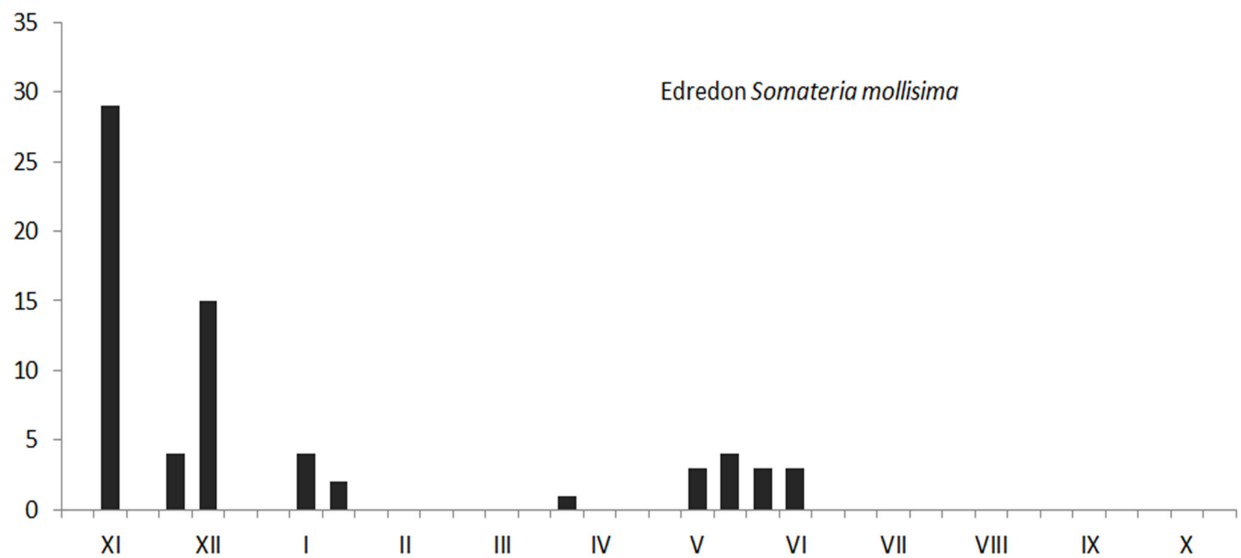

Figure 81 Dynamics of common eider occurrence
(source: Orbital 2016).

Merganser *Mergus merganser* (No = 2,534 individuals, Ns = 35 records)

Species observed regularly. Birds were usually observed on the west side of the harbour in groups of no more than a dozen individuals. The species was most abundant in the area in July and August, when permanent residents were joined by migrating juveniles. The highest count was 323 birds on August 36, 2016. In March-April - at the beginning of the breeding season only a dozen or so birds in the area. This is illustrated in the figures below.

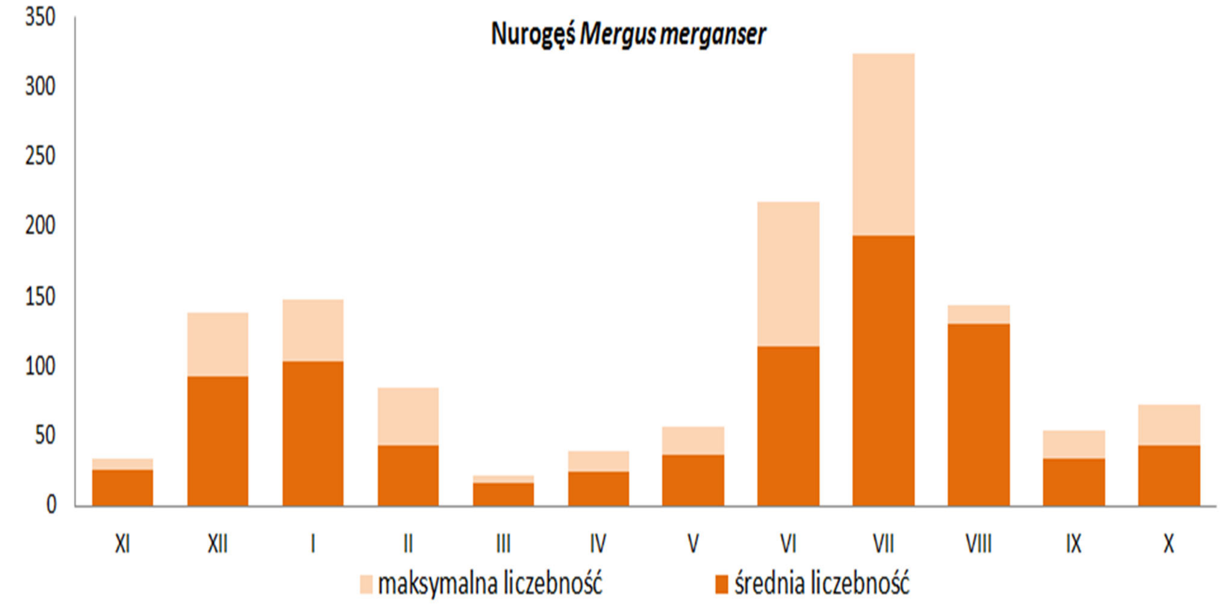

Figure 82 Dynamics of the occurrence of merganser on a monthly basis
(source: Orbital 2016).

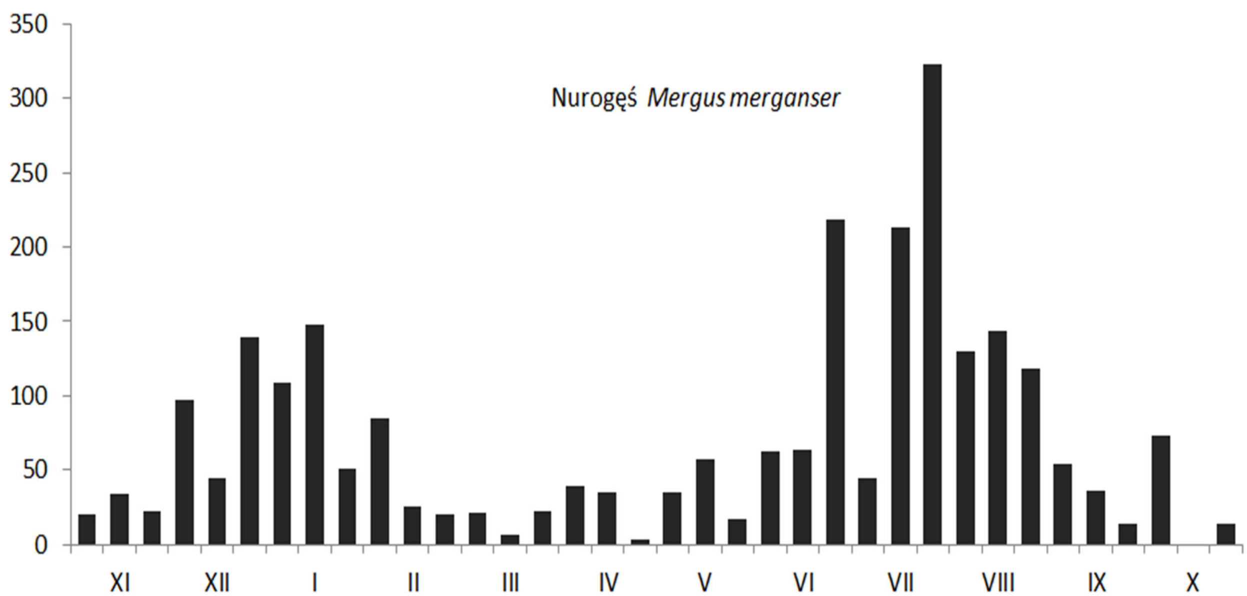

Figure 83 Dynamics of merganser occurrence
(source: Orbital 2016).

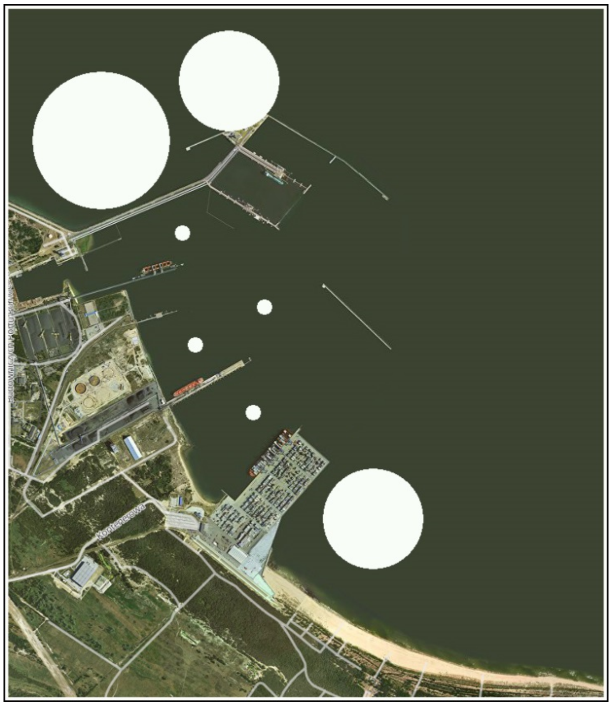

Figure 84 Locations within the port area with the most abundace of long-tale ducks.

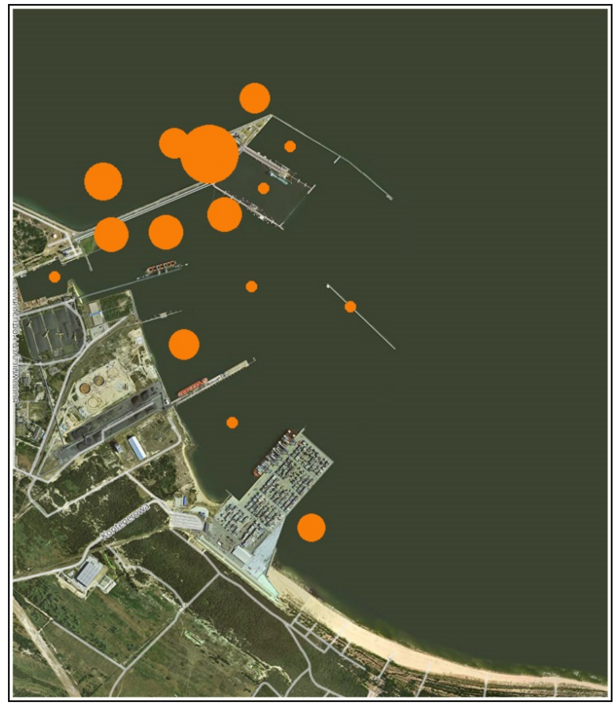

Figure 85 Locations within the port area with the most abundance of nurogos.

Mergus *Mergus serrator* (No = 35 specimens, Ns = 7 observations)

Very sparsely found in November-March. Usually in small groups of 2-4 birds.

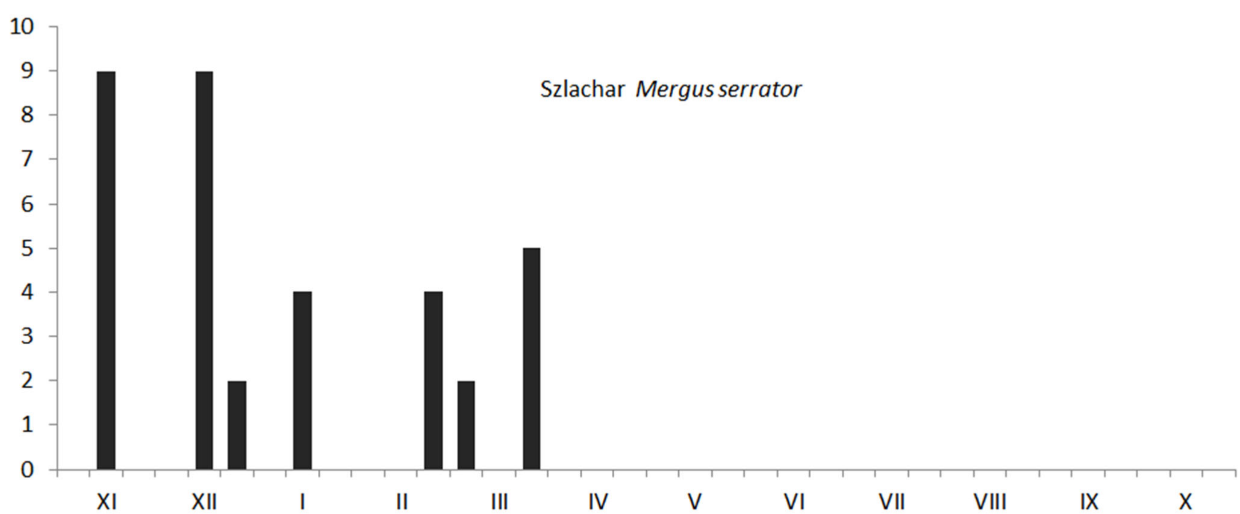

Figure 86 Dynamics of the occurence of mergus
(source: Orbital 2016).

Black-headed gull *Chroicocephalus ridibundus* (No = 9,437 individuals, Ns = 30 records)

Birds were observed in the area virtually year-round. Dynamics strongly distorted by the hour of the observation. All afternoon observations showed many times greater representation of birds that used harbour structures for safe night stays.

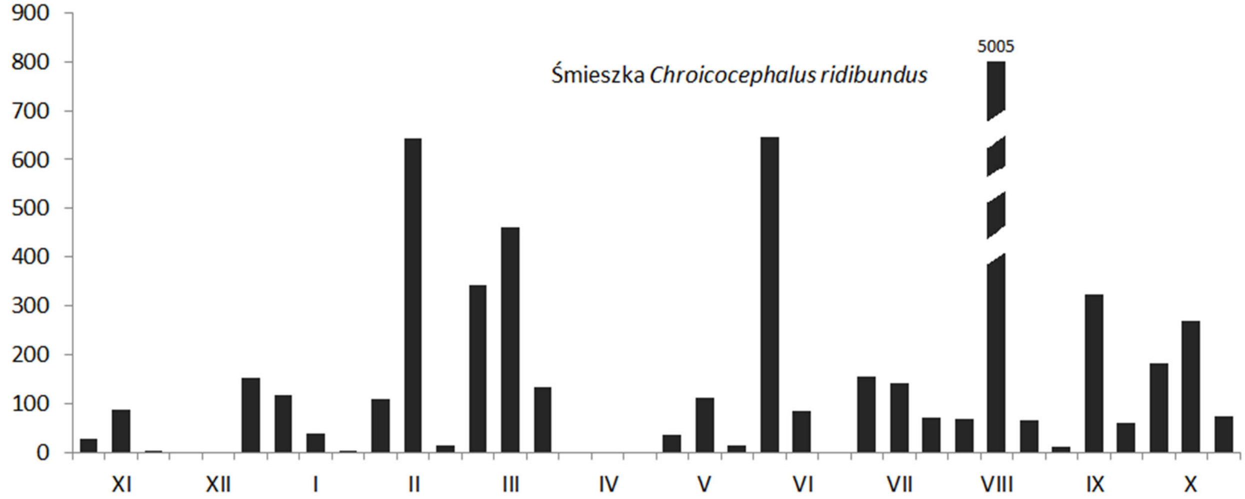

Figure 87 Dynamics of the occurrence of the black-headed gull
(source: Orbital 2016).

European herring gull (No = 28,435 individuals, Ns = 36 findings)

Because of diagnostic problems, the species silver gull included silver gull *Larus argentatus*, white-headed gull Larus *cachinnans* , and Roman gull Larus *michahellis*. The vast majority were European herring gulls, but - especially during warm periods - some birds were individuals from the other two species, with the Roman gull making up a small proportion.

Birds in the area were present throughout the season, most abundant during the winter. It seems extremely likely that port areas are used (as roosting grounds) by at least 12,000 individuals.

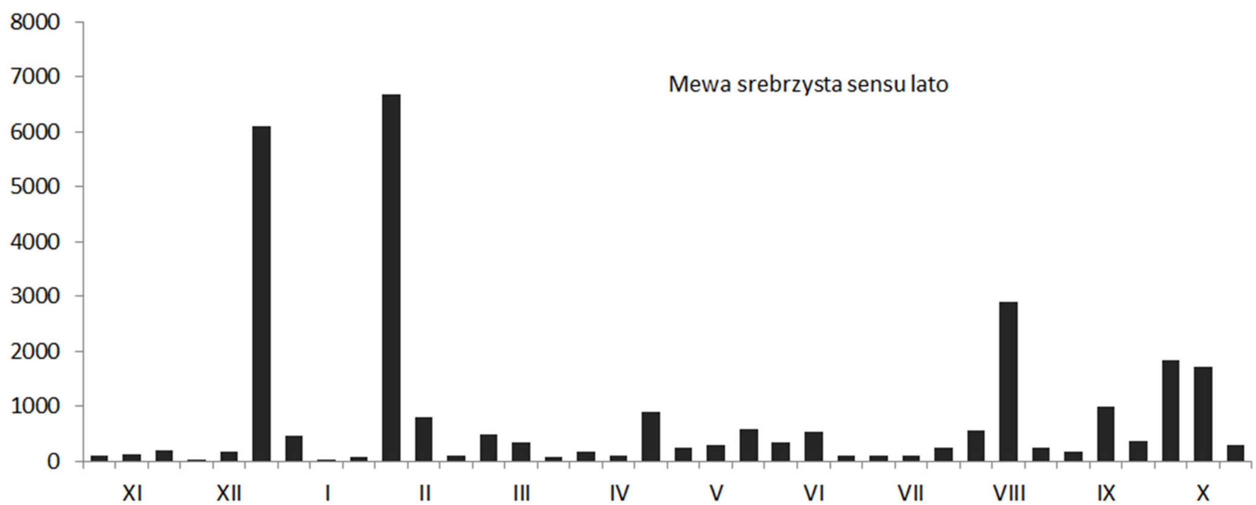

Figure 88 Dynamics of silverback gull occurrence
(source: Orbital 2016).

Grey Gull *Larus canus* (No = 25,610 individuals, Ns = 28 records)

A species that winters in large numbers in the harbour area. Most abundantly observed on evening-night checks. It seems that during the winter period min. 10,000 birds of the species.

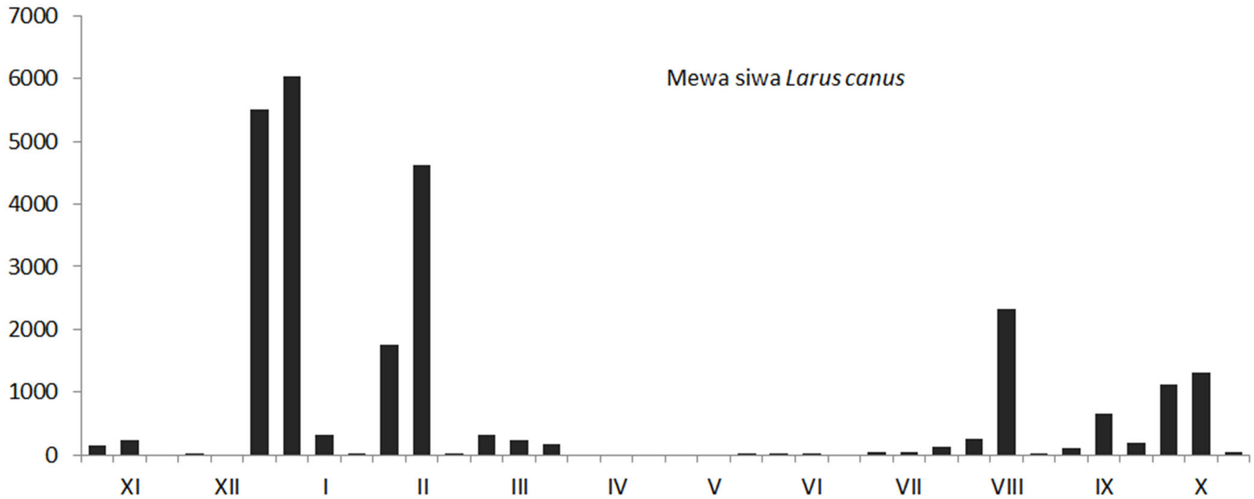

Figure 89 Dynamics of gray gull occurrence
(source: Orbital 2016).

Black-backed gull *Larus marinus* (No = 1,522 individuals, Ns = 34 records)

Species observed throughout the season. They were abundant during August-February, when more than 120 individuals were occasionally found in the harbour area. During the breeding season, single immature birds were observed in numbers not exceeding 10 individuals.

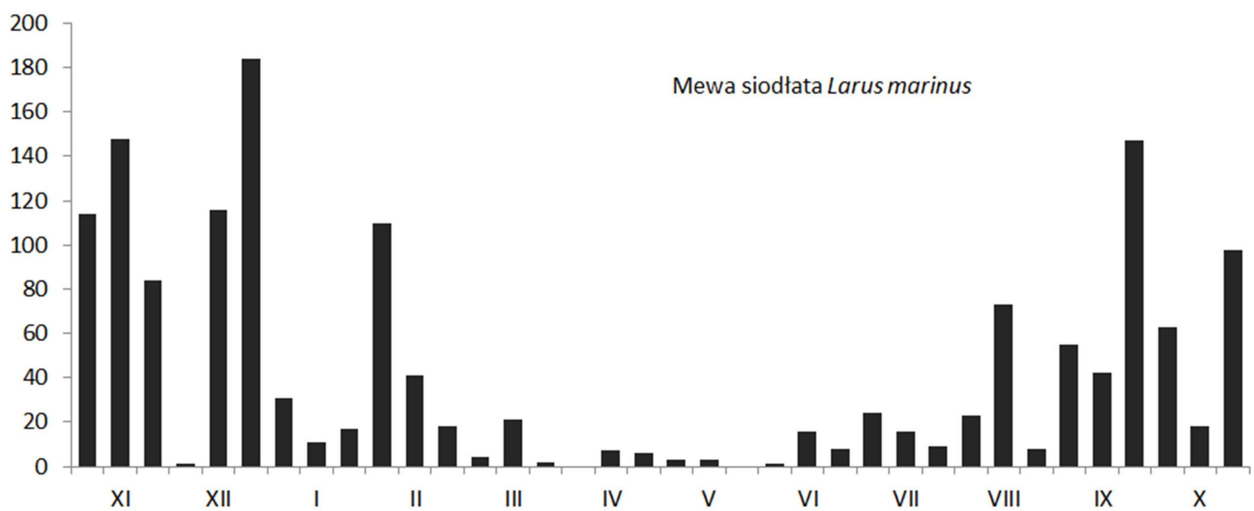

Figure 90 Dynamics of black-backed gull occurrence
(source: Orbital 2016).

Common Tern *Sterna hirundo*

One of the two colonies of this species on the Gulf of Gdańsk was located in the area (on platforms on the ore pier). Birds were present in the area during the breeding season at each of the controls. A maximum of 170 flying birds were recorded.

Coot *Fulica atra* (No = 976 individuals, Ns = 17 records)

In the area birds were found practically only in November-March period (1st decade). Birds wintered in the harbour area in small numbers during the first period not exceeding 40-50 individuals. By late March and early April, the number of birds had tripled.

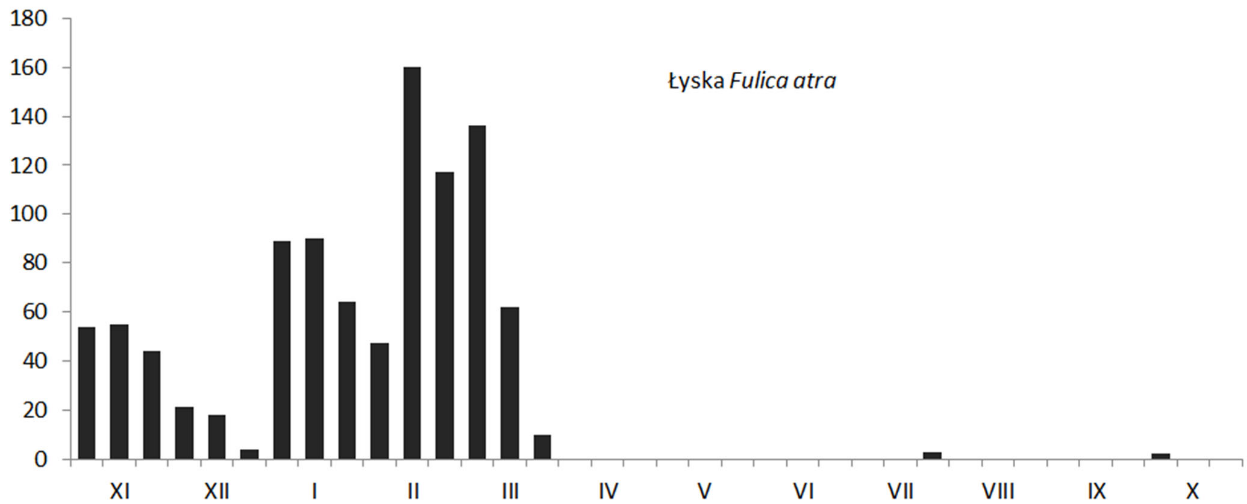

Figure 91 Dynamics of coot occurrence
(source: Orbital 2016)

6.6.1.3.2 Breeding season

During May-August in the entire monitoring area (cf. chap. 1.4), parallel work was conducted to assess the abundance of nesting birds in the area (Orbital, 2016). The study focused solely on wetland birds. Each time the work was conducted, the birds found were mapped, and efforts were made to determine the breeding success of the species in the area.

The work revealed confirmed nesting of three species:

- tern,
- silver gull;
- black-headed gull.

Common ringed plovers *Charadrius hiaticula* and mallards *Anas platyrchynhos* were recorded in the area several times during the work, but in both cases nesting could not be confirmed.

Table 32 Number of nesting wetland birds during the 2016 season.

No.	Species	Number of nesting pairs
1	European herring gull *Larus argentatus*	16
2	Black-headed Gull *Chroicepchalus ridibundus*	5
3	Common Tern *Sterna hirundo*	79

European herring gull *Larus argentatus*

The birds nested in three locations in the area: in the area of the oil port base, on the Ore Pier, and on the island breakwater. Three pairs were recorded in the Naftoport area, with one pair attempting to nest on one of the roofs, while two pairs were building nests by the mooring dunes on the quay. Nests on the waterfront were destroyed, The pair nesting on the roof abandoned the nest for unknown reasons. At the Ore Pier, three pairs began nesting - two pairs built nests on the pier caps, one on the end section of the pier deck. All were destroyed - probably as a result of fox predation. On the island breakwater, 10 pairs (the maximum number of birds breeding at the same time) started to breed. Regular mooring of barges and dredges (working on dredging the basin at T 2) at the island breakwater and frequent penetration of the habitat by workers throughout the breeding season led to losses of most breeding birds. Between 2011 and 2013, 10 to 13 pairs nested annually on the island breakwater.

Figure 92 Nesting sites of silverback gull *Larus argentatus*.
The yellow line marks the investment area
(Source: based on Orbital 2016).

Black-headed Gull Chroicocephalus ridibundus

Nesting was confirmed at one site in the area - 5 pairs nested on the Ore Pier. Two pairs built their nests on the deck adjacent to the tern platforms, two more on the platforms themselves, and one on the cap on the east side of the pier. Four broods were lost - two nests were abandoned during the construction phase (one on the deck and one on the platform), and two were abandoned after one egg was laid. The only successful breeding was confirmed on one of the platforms where the adult birds managed to bring out three young.

Figure 93. Nesting sites of the black-headed gull *Chroicocephalus ridibundus*.
The yellow line marks the investment area
(Source: based on Orbital 2016).

Common Tern *Sterna hirundo*

The species has been nesting on an ore pier in Port Północny for several years. Since 2011, birds have been nesting on five prepared nesting platforms located in the end section of the pier, installed as part of compensatory actions resulting from the transformation of the business activity in the embankment section of the pier (where birds previously nested).

In the 2016 season, despite the intensive work carried out on the adjacent basin (dredging) and maintenance of the pier supports (sandblasting), birds proceeded to breed, although unlike in previous years, the breeding season ended in mid-August (departure of the last young birds) rather than in early September. It appears that birds that lost broods elsewhere and repeated broods at the colony in the Port did not appear at the colony during the 2016 season.

During the entire breeding season analysed, 79 tern nests were recorded, three of which were outside the platforms on the pier deck. The number of fully successful broods (colony departure) is difficult to determine due to the mixing of birds on the platforms. Over the course of the season, 7 nests were destroyed/abandoned by birds. A minimum of 156 young (flighted) birds left the breeding colony in 2016.

Figure 94 Nesting sites for terns *Sterna hirundo*.
The yellow line marks the investment area
(Source: based on Orbital 2016).

Compared to previous years (2011-2013) from which comparable comprehensive data were available, nesting of the following species was not confirmed in the study area:

- Common shelduck *Tadorna tadorna*. Between 2011 and 2013, 1-3 pairs were recorded in a portion of the study area (the basin on the west side of Ore Pier). No stationary birds were observed during the 2016 breeding season, only up to 2 pairs were recorded during the spring migration period at two checks in late February and early March.
- river whitefish *Charadrius dubius*. Between 2-3 pairs of birds nested in the area from 2011-2013. One pair was regularly breeding in plot II d (Fig. I), other pairs were found in the area now occupied by Terminal T 2. In plot II d, intensive reefing activities were ongoing during the 2016 season, not allowing the birds to settle, despite their continued presence of birds early in the breeding season.
- Common ringed plover *Charadrius hiaticula*. On several occasions during the breeding season, single birds and pairs of birds were found both at the Ore Pier and in the area of the newly constructed (2016 season) parking lot at DCT. Both sites have not been permanently occupied, but only visited by birds that have either lost their breeding grounds or have attempted to re-breed outside the area of mitigation activities carried out on the eastern side of the DCT container terminal. Between 2-3 pairs of birds nested in the area during

2011-2013. The nearest occupied site is on the east side of the terminal and is occupied by at least 2-3 pairs of birds - similar to 2011-2013 when 2 pairs nested regularly in the area.

- Mallard Anas *platyrhynchos.* No breeding birds were confirmed in the area during the 2016 season. Between 2011 and 2013, a minimum of 2-3 nesting females were recorded, with a minimum of 2 females nesting on the Ore Pier each year. In 2016, due to ongoing support maintenance work, birds were unlikely (unable to fully inspect all potential sites under the pier deck) to attempt breeding.
- Common eider *Somateria mollissima.* On 1 June 2012, a female was found brooding freshly hatched 4 young, of which three grown chicks survived until 31 July. In 2011 and 2013, one brooding female was recorded on the island breakwater at the height of the DCT. No breeding success was recorded. No nesting of the species has been confirmed since 2013.
- Goosander *Mergus merganser. During* the 2016 season, no females were recorded in the entire plot carrying young either freshly hatched or females with young already grown which may suggest breeding outside the area. Between 2011 and 2013, between 4 and 7 pairs were found raising young, respectively. Only females with small 1-3 day old chicks were recorded to avoid overestimating numbers or considering females that arrived from the immediate area as breeding. Taking into account the number of successful females and the number of females that were present in the area of the planned project during the initial period of breeding, as well as the pressure of predators significantly limiting the breeding success, it should be assumed that in 2012 alone 12-14 females nested in the part of the study area (limited to the area of the Ore Pier and the DCT terminal and adjacent basins).

6.6.1.4Marine teriofauna

Four species of mammals regularly occur in the waters of the Gulf of Gdańsk:

- grey seals *Halichoerus grypus fabr*. (most common and most numerous),
- ringed seal *Phoca hispida* (individual sightings have been recorded along the entire Polish coast),
- common seal *Phoca vitulina* (single specimens have been recorded in the waters of the Gulf and on the Polish coast),
- harbour porpoise *Phocaena phocaena L.* (found rarely in Bay waters).

The grey seal is the only species regularly occurring in the southern Baltic Sea and currently forms small aggregations here. It inhabits mainly the coastal zone, occasionally entering inland rivers. The other two Baltic seal species are, the smallest of them all, the ringed seal, which inhabits the northern Baltic up to the limit of the winter ice extent, and the common seal, which forms sparse colonies on the southern coasts of Sweden and Denmark.

So far, gray seals in the Polish coastal area have been observed resting, moulting and feeding, but not mating or breeding. The distribution of gray seals is related to the availability of a food base during some life periods (Thompson et al. 1991), and in others - with the availability of terrestrial habitats (in some cases interchangeably ice), necessary for the most important stages of the life cycle, i.e. reproduction and moulting, as well as resting. The gray seal is a migratory species. It is characterized by high mobility and long-distance migrations throughout the population range (Sjöberg 1999, Sjöberg and Ball 2000).

Gray seals are found throughout the Polish coast (Pawliczka 2012). The greatest number of cases of their presence is observed in the area of the Gulf of Gdańsk, including Puck Bay and the mouth of the Vistula River, as well as the offshore part of Hel Peninsula. Most sightings of gray seals are in the "Mewia Łacha" reserve in the Vistula Mouth of the Przekop (Vistula Dug-through).

Two populations of harbour porpoise - eastern and southwestern - have been identified as a result of the SAMBAH project surveys. The eastern population, about 500 individuals, is dispersed over a large area, including the area of the Gulf of Gdańsk. According to the research, the probability of recording a detection in the area of the Gulf of Gdańsk is 0 - 1% in August (with maximum values of 50-60%) and 10 - 30% in February. The south-western population is much more dense in summer, in a smaller area, with a number of individuals of about 20,000, with a probability of detection there of 90 - 100%[23].

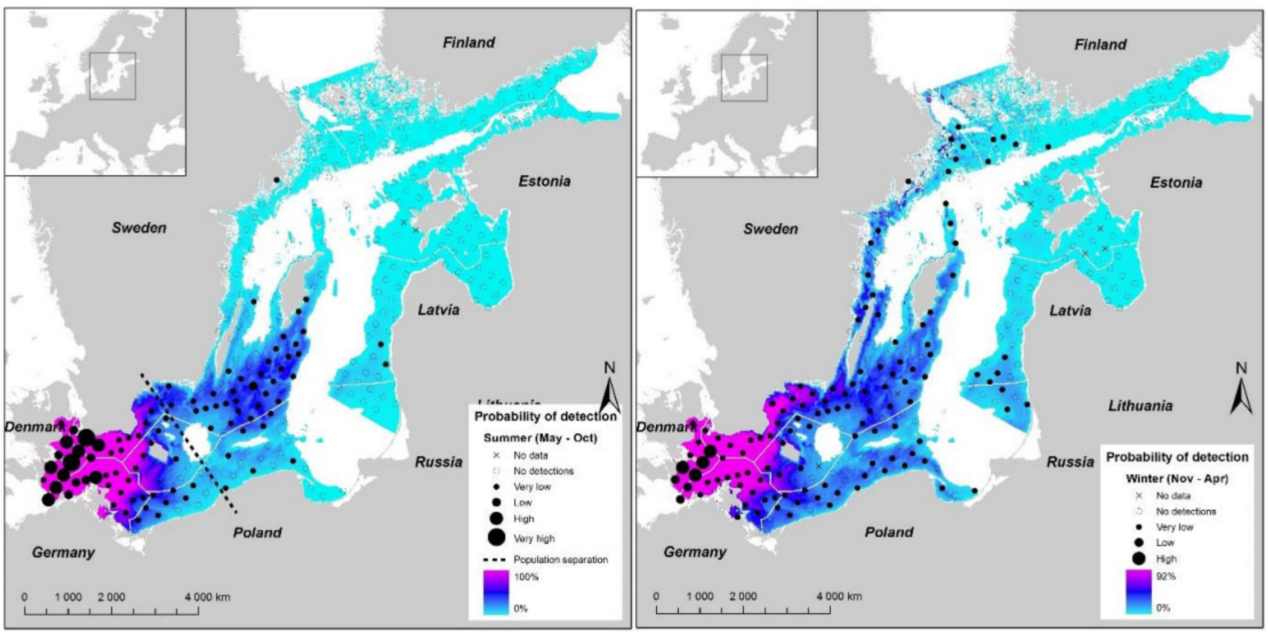

Figure 95 Probability of detection of harbour porpoise in summer (May to October) and winter (November to April)
Source: LIFE+ SAMBAH project 2016. Final report covering the project activities from 01/01/2010 to 30/09/2015. Reporting; Date: 29/02/2016. http://www.sambah.org/SAMBAH-Final-Report-FINAL-for-website-April-2017.pdf

[23] www.sambah.org

6.6.2 General description of land facilities of the investment

Due to the fact that the project will be executed entirely within the sea area, outside the land area, the characteristics of terrestrial ecosystems were limited mainly to the issues related to the nearest dune and forest belt, located about 300 m to the south of the eastern part of the planned investment. This part of the site is, in terms of natural conditions, the most significant, due to the fact that it is the area of mitigation activities related to the construction of the T2 terminal, carried out on the basis of the decision on environmental conditions marked RDOŚ-Gd-WOO-4211.29.2013.AT.9 dated 28.03.2014. Mitigation measures have been taken for bird species that are the subjects of protection within the "Bay of Puck" Natura 2000 site. The most significant issue related to the impacts of the proposed project is its potential impact on the effectiveness of the aforementioned mitigation measures. Therefore, the characterization of the natural elements of the site was limited to:

- avifauna, with particular emphasis on breeding birds protected in the Natura 2000 site and subject to impact mitigation measures;
- vegetation - as the basic element determining the habitat conditions for breeding birds.

The land base of the proposed project consists of heavily transformed, invested port areas. Only in the further surroundings - the eastern part of the project there is a strip of coastline similar to the natural one. It is an area of diverse coastal ecosystems, which, however, have been influenced by various direct and indirect forms of anthropopression for many years (at least since the beginning of the 20th century). It is connected with shore reinforcement and deposition of foreign substrate, with the former use of the area as a location for military fortifications (bunkers, trenches), as well as with illegal mining of amber. Anthropopressure to the area also results from the current proximity of Port Północny industrial area, as well as recreational use of the beach strip, dunes, and forest. As part of the natural mitigation efforts, the subject site has been fenced with mesh and is being monitored, which has excluded some of the pressures described above.

6.6.3 Vegetation and natural habitats and avifauna of the hinterland

6.6.3.1General characteristics of vegetation

In the inland hinterland of the project, outside the strictly port area, dune communities occur in a strip approximately 200m wide. At the seashore, these are mainly coastal dune communities dominated by the common sand dune *Ammophila arenaria*, locally also by the sand dune *Honkenya peploides*. At the shore, small areas of Nakidzin communities are also found with the sea rocket *Cakile maritima and* , less frequently, the spear-leaved orache *Atriplex prostrata*. Further from the shore patches of *Helichryso-Jasionetum* grey dune grasslands are developed, with the presence of *Jasione montana*, *Carex arenaria*, and *Corynephorus canescens*.

Coastal white dunes in the study area occur in a spatial complex with gray dune communities, and the boundary between the two is arbitrary. Physiognomically, these are narrow, parabolic sand banks, developed parallel to the sea shoreline; exceptionally and on a small scale, they appear secondarily and rather briefly on the leeward slope of the dune shaft in places where, for various reasons, the vegetation cover of the grey dune has disappeared. The constant movement of sand and the periodic influence of abrasion are the determinants of system instability. The *Elymo-Ammophiletum arenariae typicum* complex was found here, very resistant to significant annual blowing and blowing away and strong insolation. The dominant species are the common sandpiper *Ammophila arenaria*, the Baltic reed warbler *xCalammophila baltica* and the seaside pea *Lathyrus* *japonicus* subsp. *maritimus, and* the less abundant sand blowfly *Leymus arenarius*. Permanent companion species are the coastal hawkweed *Hieracium umbellatumv* var. *dunense* and the tall fescue *Festuca villosa*. The *biennial* evening primrose *Oenothera biennis* occurs singly.

The white dune within the study boundary extends approximately 250 m and occupies an estimated area of approximately 0.9 ha.

Psammophilic gray dune communities occur only as a strip of dune of variable width and height, consolidated by vegetation cover, with initial soil-forming processes marked. Grey dunes occur behind white dunes (sometimes, when white dunes are absent due to various reasons, e.g. abrasion - directly behind the foreland 2110) and usually border with soil-protective reforests naturalizing in the direction 2180-4 or spontaneously transform into the initial stages of crowberry coastal forest. These are consolidated sands, overgrown by the psammophilous grassland *Helichryso arenarii-Jasionetum litoralis within which, one can distinguish subcomponents: festucetosum arenariae* (young forms, with quite numerous elements of white dune vegetation), *typicum* (developmentally advanced, quite dense, forms with a high proportion of grey brush *Corynephorus canescens* and a distinct development of the moss-lichen layer) and *cladonietosum (in the driest parts of the dune, usually on the top)*. The community is relatively persistent and its further development ends with spontaneous regeneration of pine trees and, due to subsequent pinetization, leads towards the coastal crowberry forest *Empetro nigri-Pinetum (habitat 2180-4)*.

The grey dune within the study area is mainly composed of dense bunchgrass *Corynephorus canescens*, coastal hawkweed *Hieracium umbellatumv* var. *dunense* , and common sandpiper *Ammophila arenaria*. The sand martin *Jasione montana*, the sand sedge *Carex arenaria* and the *tricolor* violet *Viola tricolor* var. *maritima*are scarce. The species of distinction - seaside myrtle *Eryngium maritimum*- was not found. A lichen layer with *Cladonia furcata* develops in the driest parts of the dune. In addition, several patches (each about 30-40 m^{2}in area) were found to contain an alien invasive species - *Rosa rugosa*.

The gray dune within the study limits extends approximately 250 m and occupies an estimated area of approximately 0.8 ha.

In addition, within the limits of the study - mainly in the southwestern part, thickets with sea buckthorn *Hippophaë rhamnoides* were found - in natural stands it is a protected species.

In a narrow strip close to the shoreline, there are communities of Nakiadina with the coastal watercress *Cakile maritima* and the occasional occurrence of the second characteristic species, the spear-leaved orache *Atriplex prostrata*. These communities are characterized by low compactness, which is typical for this type of phytocenotic systems.

In addition to the strip of dune communities, forest communities occur more than 200 m from the shoreline (more than 500 m from the proposed project). These are pine stands originating from plantations and partially from self-sown trees, with the share of other species, such as the bearded birch *Betula pendula*, the black pine *Pinus nigra* or the common oak *Quercus robur*. They have developed on the habitat of fresh coniferous forest. The undergrowth consists of, among others, buckthorn *Frangula alnus*, mountain ash *Sorbus aucuparia* and Norway maple *Acer platanoides*. The composition of the undergrowth is variable, formed mainly by species such as: *Calamagrostis epigejos, Deschampsia flexuosa*, *Athyrium filix-femina*, *Rumex acetosella* , and *Carex arenaria*.

Of the plant community types found, three represent natural habitats of European Community interest, as defined by the current Regulation (2010). These include:

- seashore wreck line (code 1210),
- coastal white dunes (2120),
- coastal gray dunes (2130).

Photo 1 Land back area - general appearance.

Photo 2 White dune.

Photo 3 Gray dune.

Photo 4 A small patch of wreck line with sea rocket *Cakile maritima*

Photo 5 Alien invasive species - Rosa rugosa wrinkled rose on a gray dune.

6.6.3.2 Terrestrial avifauna

The onshore hinterland area of the planned project, located approximately 300 m south of the eastern part of the planned T3 terminal, is of key importance as an area for natural activities to offset impacts associated with the previous DCT expansion. The mitigation activities at the beach and its facilities are carried out here in accordance with the decision of RDOŚ-Gd-WOO.4211.29.2013.AT.9 dated March 28, 2014. Therefore, the effectiveness of these actions is monitored on the strip of beach adjacent to the DCT (length of about 460 m) together with the adjacent body of water.

6.6.3.2.1 Breeding avifauna

Inspections of nesting birds on the beach, which are the subject of these offsetting actions related to the previous DCT expansion described in the environmental decision, were performed frequently enough to obtain a complete picture of breeding. To the greatest extent, this concerned the common ringed plover, nesting from the first year on the beaches in the area of mitigation activities. Between April and August, at least four inspections per month were performed in each month. The breeding avifauna surveys were developed based on the results of the Mitigation Action Area monitoring, considering data for the breeding season from 2014 to 2017.

The mitigation area was specially prepared for two species of waterbirds: the ringed plover and the least tern. Site preparation and supervision consisted of:

- a permanent fence going about 10 m into the sea and sunk about 1 m into the ground, cutting off access of people and land predators to an area of about 4 ha.
- placing about 20 information boards on the fence, informing about the activities, video surveillance and access ban.
- gravel berms (made up of approximately 3 tons of 8-32 mm gravel) have been placed twice since 2014.
- the removal of vegetation from a portion of the beach in 2017.
- white tern voice emissions (early May through July).
- placing plastic figurines of least terns. They are designed to attract flying birds and interest them in the site.
- installing photo traps to monitor the appearance of predators.
- monitoring for signs of predators.
- introducing round-the-clock security from the beginning of April until about mid-September (depending on the presence of nesting birds at the end of the season).
- mounting protective baskets on found nests of ringed plovers, ringing of nestlings (parts).

Additionally performed:

- 10 holes for common shelduck made of concrete circles and entrances made of plastic pipes with diameter of 20 cm
- 30 boxes for mergansers, with spikes placed on trees in a way that prevents predators from accessing the boxes
- 5 C-type hoopoe boxes mounted on trees outside the beach area (in the adjacent forest)
- 200 type A and B sparrows boxes mounted on trees mostly outside the beach area (in the adjacent forest)

As a result of monitoring breeding birds from 2014 to 2017 (4 breeding seasons), some nesting common ringed plovers were found in each season. There has been a case of two broods in one female, both successful in the form of flying chicks. Details of the breeding of this species in each year are shown in the table below. Noteworthy is the very high survival rate of young birds raised in the area. So far, virtually all ringed chicks are observed after a year or two while nesting in the nearby Mewia Łacha or Ptasi Raj nature reserves.

White-cheeked terns are seen annually in the area, but only in 2016 was a pair of birds seen long enough to talk about a likely breeding. However, the nest was not found and if it was - it must have been looted. Between 2014 and 2017, pairs (1-2) and then families of mergansers (females with young) were observed resting on the beach each year. However, we were unable to find signs of breeding in the boxes provided for this species. Common shelducks were only seen in the area of ongoing mitigation efforts in 2014 and this was a single observation of one bird.

Table 33 Summary of breeding success of common ringed plovers in the area of ongoing mitigation efforts in subsequent seasons.

rok	liczba lęgów	liczba lotnych piskląt	sukces lęgowy (N/lęg)	zaobrączkowane, które przeżyły do lotności	wiadomości powrotne
2014	1	2	**2**	2	2
2015	3	8	**2,7**	5	5
2016	4	7	**1,8**	2	1
2017	3	1	**0,3**	1	0
RAZEM	**8**	**17**	**1,6**	**10**	**8**

6.6.4 Ecological and migration corridors

6.6.4.1 Ecological corridors - general issues

The area of the planned project is located within the South Baltic Sea supra-regional migration corridor, which was indicated in the now obsolete "Pomorskie Voivodeship Spatial Development Plan 2009". This corridor includes the coastal zone of the southern Baltic Sea, which is a European waterfowl migratory corridor between north-eastern Europe and wintering areas in western Europe. Within the Pomorskie voivodeship it runs in the coastal zone of the Gulf of Gdańsk and the open sea, from the Vistula Spit through the Vistula Marshland, the Hel Peninsula and the Słowińskie Coast, reaching the 20 m isobath on the sea side (this is the area of residence and feeding of waterfowl), while on the land side it covers the dune belt with coastal forest communities, coastal hydrogenic plains and lakes. The most important factor in maintaining migration conditions is to leave habitat and stopover areas - such as wetlands and coastal water bodies - in their natural state.

A significant limitation of the spatial connectivity of this corridor is the developed coastal zones of port cities with the Tri-City metropolis at the forefront, Władysławowo, Łeba and Ustka. These cities cut through the continuity of terrestrial systems, making the corridor of limited importance for terrestrial mammal migration, but not a definitive barrier to bird and bat migration.

The Vistula Spit functions as an ecological corridor in the system of the coastal belt of the Gulf of Gdańsk, the proper Spit, the belt of the Vistula Lagoon on the side of the Spit and a fragment of the Vistula Marshland adjacent to the Spit, creating a complementary system serving the life needs of migrating organisms. It is a kind of "migration axis" - determines both the direction (approximately east-west) and the approximate width of the migration belt. According to the literature data[24] it is one of the biggest bird migration corridors in Poland, with international importance for this group. Birds migrate along the coast using stopover sites in the Baltic coastal zone and coastal wetlands, such as the Vistula Lagoon, the Vistula Mouth, and the Bay of Puck. The site lies along the transcontinental eastern Atlantic migratory route for birds and bats, connecting breeding grounds in northern Europe and western Siberia with wintering grounds in southern and western Europe and northwestern Africa. The specific location of Vistula Spit in geographical space, i.e. adjacent to the Gulf of Gdańsk and partly to the Vistula Lagoon, makes this area an almost 100 km long orientation belt for birds and bats[25] during their spring (eastward) and autumn (westward) migration.

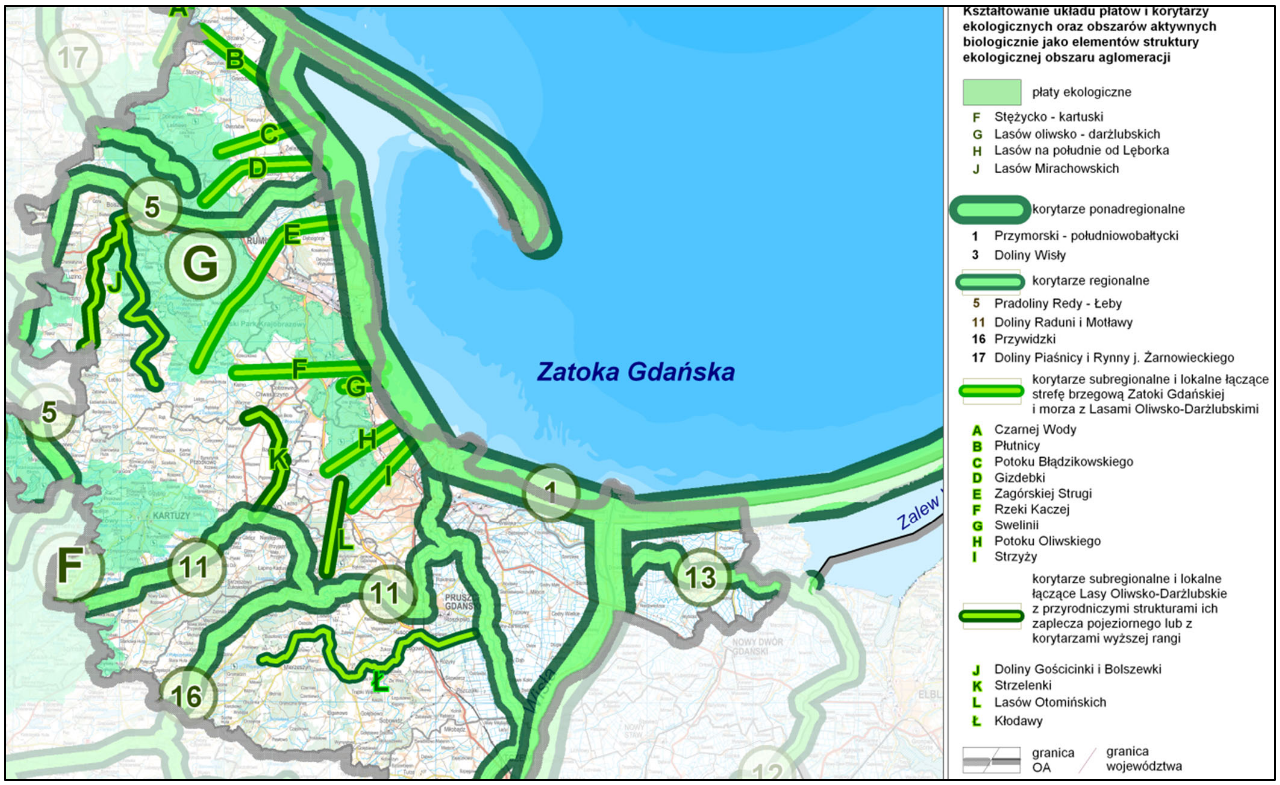

Figure 96 Schematic concept of the agglomeration's system of ecological patches and corridors.
Source: "Eco-physiographic study for the Spatial Management Plan of Pomorskie Voivodeship - update 2014" Gdańsk - Slupsk 2014.

At the same time, the planned investment, located outside the land territory, is outside the land ecological corridors - designated in the Concept of Ecological Network of Pomorskie Voivodeship for Spatial Planning (2014) and indicated in the current Spatial Development Plan of Pomorskie Voivodeship 2030.

With regard to large mammals, migration routes were developed by the Mammal Research Institute of the Polish Academy of Sciences in Bialowieza (now the Mammal Biology Institute). According to this concept, the project site is located outside of these ecological corridors.

[24] Chylarecki et al. 1995, Goc, Remisiewicz 2001
[25] Bulinski et al. 2006, Gromadzki et al. 1994, Ciechanowski et al. 2008, Jarzembowski 1999

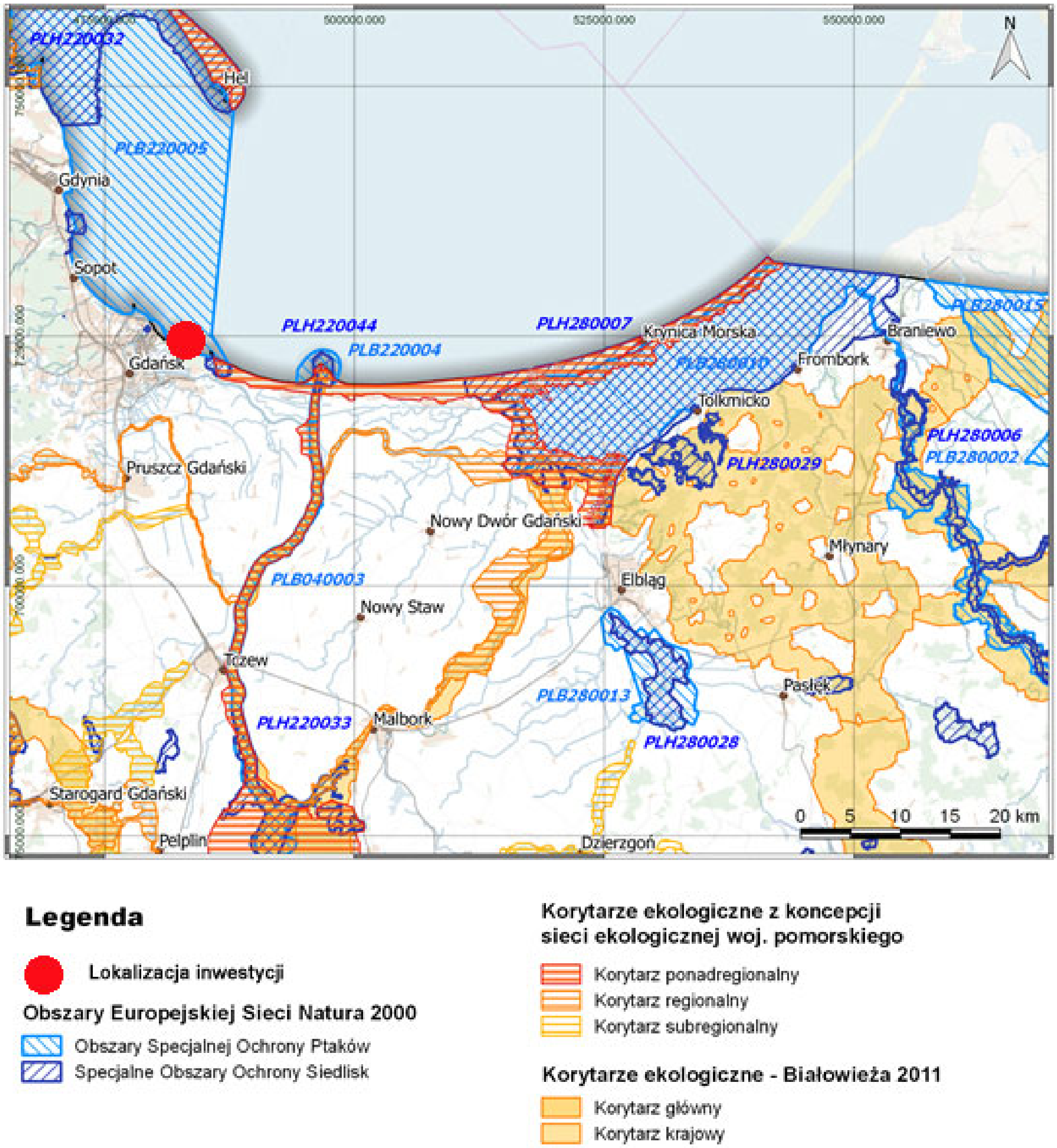

Figure 97 Ecological corridors in the area of the planned project
Source: based on Eko-Consult 2018

6.6.4.2 Relation of avifauna of the investment area with other protected areas

The area intended for the planned investment is a fragment of the coastal basin of the Gulf of Gdańsk, located about 300 m from the coastline. Birds mostly move along the shoreline here during seasonal migration. Movements of water and wetland birds in the Gulf of Gdańsk are very frequent. This is evidenced by both ringing results and direct observations (Busse and Gromadzki 1962, Brewka et al. 1987, unpublished own observations, KULING Waterbird Research Group's Database of Ringed Birds). In the flocks of cormorants that congregate in Port Północny, some are probably birds that breed in the Fisherman's Corner Reserve. In the case of wintering ducks and gulls, movements between the area of Port Północny and adjacent water bodies located in or near the Ptasi Raj and Mewia Łacha reserves were observed. Waterbird movements between Port Północny and the reserves are also highly likely: Kępa Redłowska, Mechelińskie Łąki and Beka, as well as Natura 2000 areas - Puck Bay, Vistula Estuary, Vistula Lagoon and Lower Vistula Valley. Such movements prove the existence of functional connection of protected areas located in the area of the Gulf of Gdańsk. Waterbirds move between these areas depending on local conditions (weather, habitat food abundance, anthropopressure). This means that even a temporary reduction in wildlife values at one site will affect waterfowl and wetland birds residing in other protected areas. The area of the planned investment will occupy one of many water bodies used by birds, with a total area of about 132 ha, which is a small area among generally accessible areas in the Gulf of Gdańsk. Waterfowl and wetland birds residing here during the non-breeding season may find other areas with similar habitat conditions, the closest of which are located elsewhere in Port Północny.

Similarly to the entire Vistula Spit (Jarzembowski 2003), also the section of the coast (Stogi Island) at the level of the planned project area can serve as a long-distance migration corridor for forest bat species not wintering in the underground - in particular the greater spotted bat *Pipistrellus nathusii*, and probably also the *noctule* bat *Nyctalus noctula* and (in small numbers) the wood bat *Nyctalus leisleri*. Migration routes of these species can reach 1400-1600 km in the case of representatives of the genus *Nyctalus* , and almost 2000 km in the case of the Greater Spotted Dwarf; they connect breeding grounds in the Baltic countries with wintering grounds in western and southern Europe. However, bat migration occurs mainly over the terrestrial area, outside of the planned project area.

6.6.5 Protected areas, including Natura 2000

The planned project is located within the boundaries of one area form of nature protection within the meaning of the Act of 16 April 2004 on Nature Conservation:

- **The "Bay of Puck" Special Protection Area PLB220005.**

The entire planned project (construction of the terminal and dredging) is located within the south-eastern part of this Natura 2000 site - covering a total area of approximately 132.2 ha.

In addition, the following area forms of nature conservation are located within 10 km of the planned project:

- to the south-east:
  - approximately 2.4 km: special area of habitat protection "Ostoja w Ujście Wisły" PLH220044,
  - about 2.9 km of the "Vistula Mouth" Special Protection Area of birds PLB220004,

- about 3.0 km Ptasi Raj Reserve,
- about 2.9 km: Protected Landscape Area of Sobieszewo Island,

- south and southeast:
  - about 6.7 km The Żuławy Gdańskie Protected Landscape Area,
- to the west:
  - about 2.5 km of the Site of Community Importance "Twierdza Wisłoujście" PLH220030.
  - about 9.5 km Tri-City Landscape Park.

There are also small individual forms of nature conservation within 1.0 to 10 km of the project:

- about 1.3-3.0 km - ecological grounds: "Karasowe Jeziorka" (1.3 km), "Zielone wyspy w Górkach Zachodnich" (2.4 km), "Wydma w Górkach Zachodnich" (3.7 km);
- about 6 km - "Prochownia pod Kasztanami" The ecological site (5.9 km), "Fort Nocek" The ecological site (5.9 km), The ecological site "Luneta z Pasikonikiem" (6.3 km);
- about 8.9 km - ecological use "Xerothermic grasslands in the Oruński Stream Valley",
- about 9 km: 2 natural and landscape complexes "Dolina Potoku Oruńskiego" (8.9 km) and The Natural and Landscape Complex "Dolina Strzyży" (9.3 km).

In addition, there are approximately 83 natural monuments within a 10 km radius of the project. None of them is located closer than 2.5 km to the planned investment and the vast majority is located in the edge zone of the Gdańsk Upland, more than 5 km from the investment site.

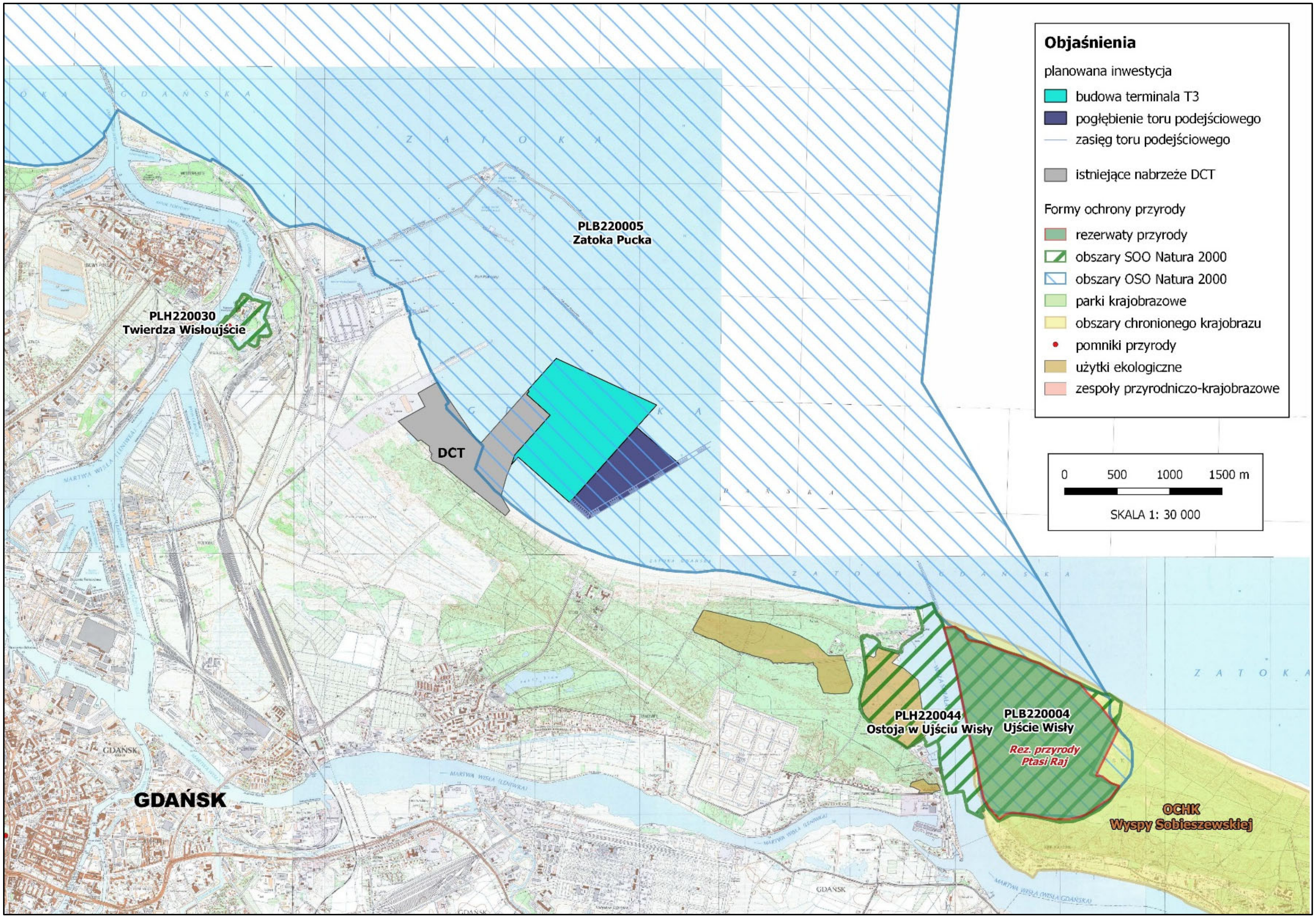

Figure 98 Existing forms of nature conservation against the background of the planned project

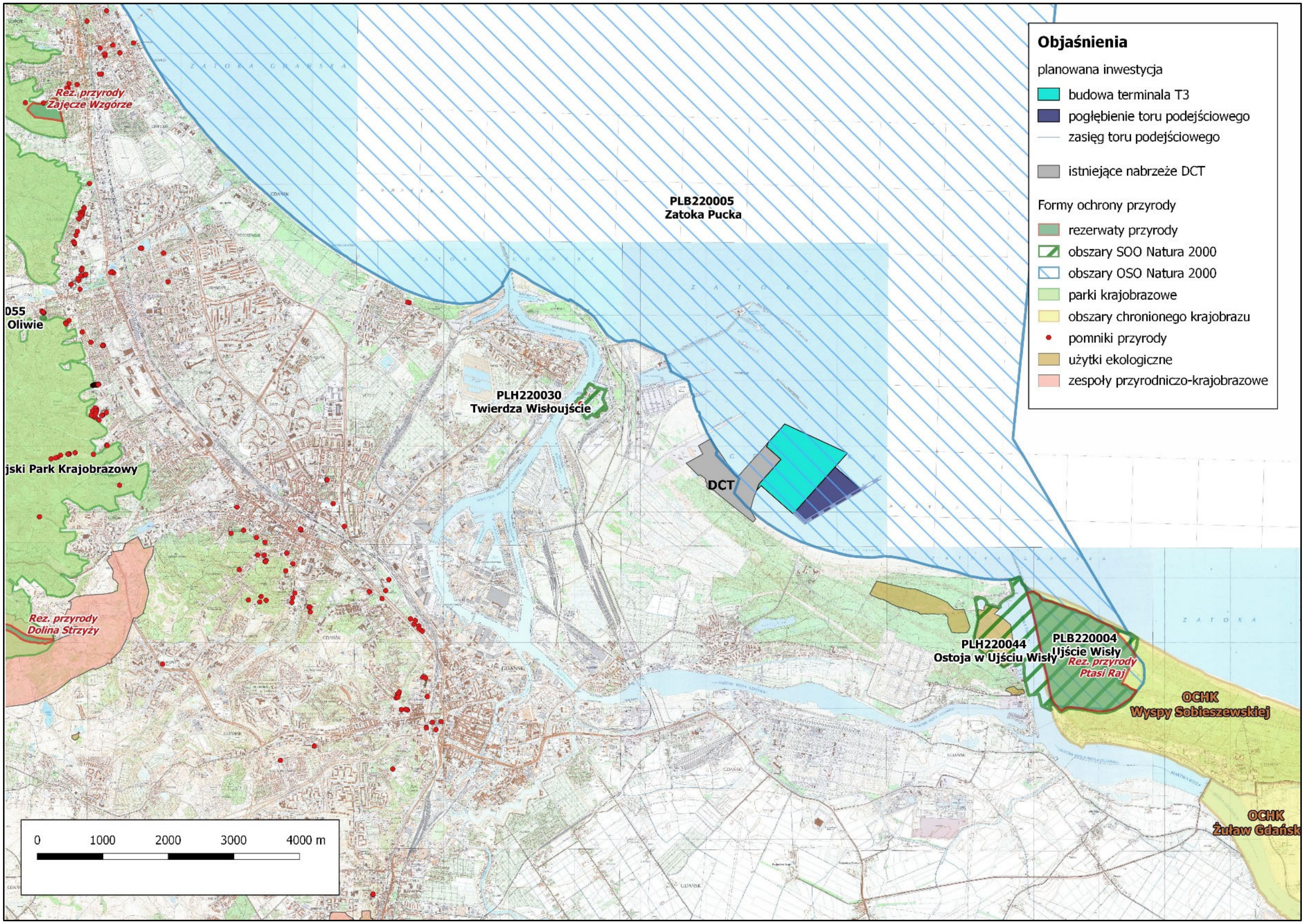

Figure 99 Existing forms of nature conservation in the subregional vicinity of the planned project

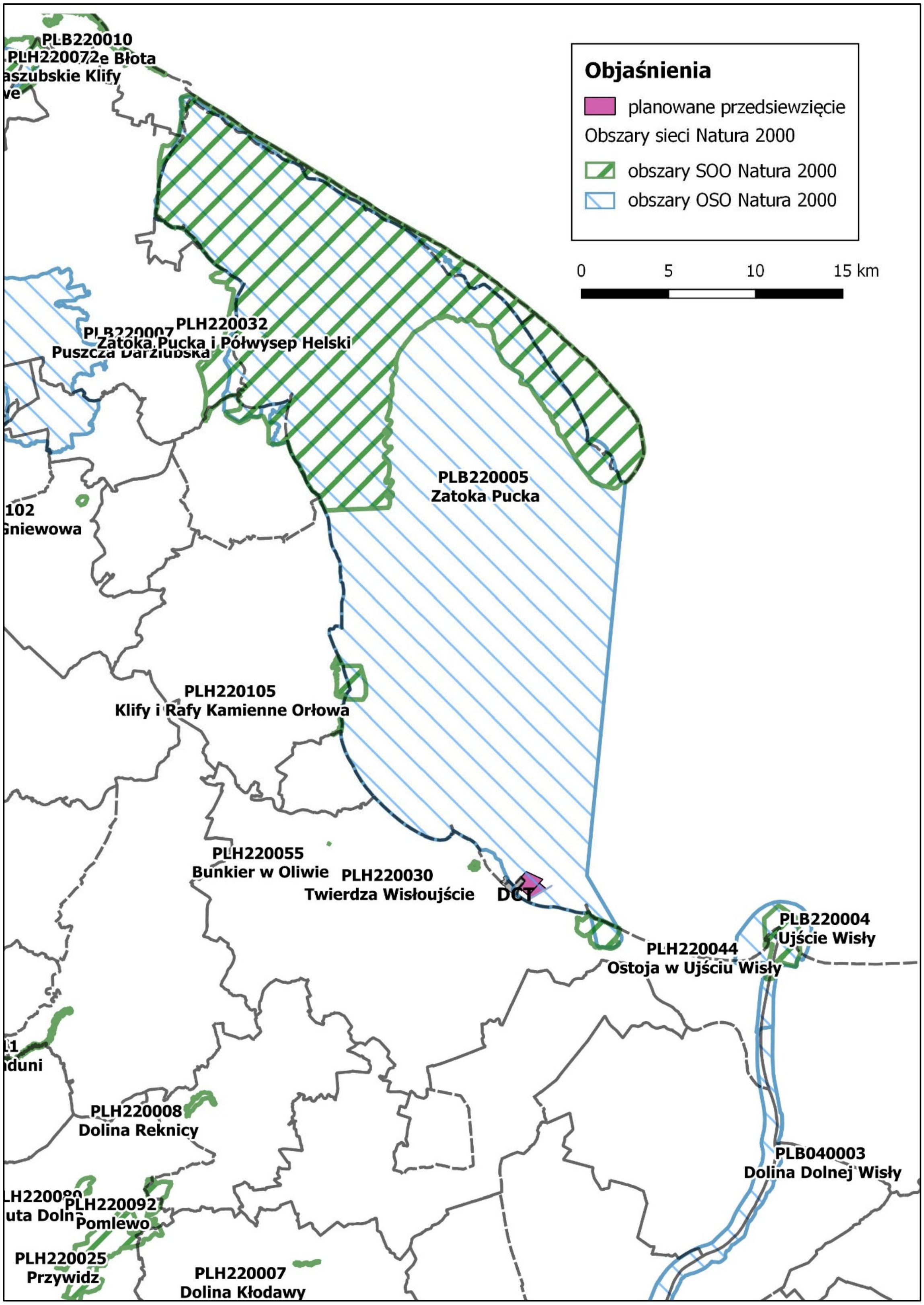

Figure 100 Location of the area of the planned project on the regional background - including Natura 2000 areas

The area of the Special Protection of Birds Natura 2000 "Zatoka Pucka" - is located directly in the area of the planned investment. From the perspective of this EIA, it is the most important of the listed forms of nature conservation. As a full-fledged form of nature protection, it was established by the Regulation of the Minister of Environment of 21 July 2004 on special bird protection areas Natura 2000 (Dz.U. 2004, No. 229, item 2313) and maintained in the latest Regulation of the Minister of Environment of 12 January 2011 on special bird protection areas (Dz. U. No. 25, Item 133, as amended); It covers an area of 62,430.43 ha, constituting mainly the waters of the western part of the Gulf of Gdańsk, between the coast of Hel Peninsula in the north, the coast from Władysławowo to the mouth of the Wisła Śmiała River in the west and south, and a line between the mouth of the Wisła Śmiała River and the end of Hel in the east. The area therefore includes both Puck Bay itself, with an area of 10,400 ha and a shallow-water character (mean depth 3 m), as well as some of the deeper waters of the Gulf of Gdańsk. The area also includes small areas of coastal meadows near Osłonin and Rewa. The dominant habitats are aquatic - marine, accounting for 99% of the total refuge area.

The area is the most important wintering and stopover site for waterbirds during seasonal migrations in Polish coastal waters. According to the Standard Data Form, the natural value and importance of SPA PLB220005 Zatoka Pucka is as follows: *"A bird refuge of European rank E 12. There are at least 28 species of birds listed in Appendix No. 1 of the Birds Directive, 11 species from the Polish Red Data Book. Nesting above 1% of the national population (C3) of the dunlin (schinzii) (PCK), common ringed plover (PCK) numbers up to 1% of the national population; until recently a ruff nested here. During the migration period, at least 1% of the populations of the migratory route (C2 and C3) of great crested grebe, great horned grebe, tufted duck occur; relatively high concentrations (C7) are reached by: whooper swan, great crested swan, pintail, moorhen, redshank, dunlin, smew, black grouse, little Eurasian curlew, Eurasian curlew, great Eurasian curlew, eurasian oystercatcher, lapwing, plover, little ringed plover and barred warbler. During the winter, at least 1% of the migratory route populations (C2 and C3) of the following bird species occur: white-tailed eagle, tufted duck, goldeneye, common goldeneye, great crested grebe, and great crested grebe; relatively high concentrations (C7) are reached by the mute swan; wetland birds greatly exceed concentrations of 20,000 individuals (C4)."*

Table 34 Nature information for Natura 2000 PLB220005 "Bay of Puck" area
(source: SDF of Natura 2000 site PLB220005 "Bay of Puck" (update date 2017-02) - www.gdos.gov.pl)

Code	Name	Population			Assessment of the importance of the area			
		Sedentary	Migrating					
		Reproductive	Transient	Wintering	Population	Senior West.	Isol.	General
ANIMALS listed in Annex I of Council Directive 79/409/EEC								
A001	Gavia stellata			0-2	D			
A002	Gavia arctica			0-7	D			
A007	Podiceps auritus		5-20	3-70	D			
A021	Botaurus stellaris	2-3			D			
A031	Ciconia ciconia			P	D			
A037	Cygnus columbianus bewickii		12-30		D			
A038	Cygnus cygnus		116-400	120-700	C	B	C	C
A045	Branta leucopsis		72		D			
A068	Mergus albellus			550-1550	C	B	C	C

Code	Name	Population			Assessment of the importance of the area			
		Sedentary	Migrating					
		Reproducti ve	Transient	Winterin g	Population	Senior West.	Isol.	Genera l
A081	Circus aeruginosus	5			D			
A082	Circus cyaneus	P			D			
A084	Circus pygargus	1-2			D			
A119	Porzana	3-5			D			
A120	Porzana parva	1			D			
A122	Crex crex	1			D			
A127	Grus grus	4			D			
A151	Philomachus pugnax			P	D			
A157	Limosa lapponica		65		D			
A166	Tringa glareola		565		D			
A167	Xenus cinereus		P		D			
A170	Phalaropus lobatus		P		D			
A176	Larus melanocephalus		P		D			
A177	Larus minutus		P		D			
A190	Sterna caspia		P		D			
A191	Sterna sandvicensis	140			A	A	B	A
A193	Sterna hirundo	6-68			C	C	C	C
A194	Sterna paradisaea		P		D			
A195	Sterna albifrons	35			B	B	C	B
A222	Asio flammeus	1			D			
A229	Alcedo atthis	1			D			
Regularly occurring birds not listed in Annex I of Council Directive 79/409/EEC								
A005	Podiceps cristatus		700-1200	1200-4500	C	C	C	C
A028	Ardea cinerea	204			B	B	C	B
A036	Cygnus olor			2500-13500	C	C	C	C
A048	Tadorna tadorna	16-25			A	A	A	A
A059	Aythya ferina		100-2000		D			
A061	Aythya fuligula		10000-30000	3000-40000.	B	C	C	C
A062	Aythya marila		500-12500	100-7000	C	B	C	C
A064	Clangula hyemalis		5000-10000	2500-10000	D			
A066	Melanitta fusca		500-3500	P	C	C	C	C
A067	Bucephala clangula		2000-7000	2000-7000	C	C	C	C
A069	Mergus serrator	P	300-700		B	C	A	B
A070	Mergus merganser	8-14		400-17000	C	B	C	C
A125	Fulica atra		6500-33500	4000-9000	C	C	C	C
A130	Haematopus ostralegus	1	345		D			
A137	Charadrius hiaticula	4-10			C	B	C	C
A141	Pluvialis squatarola		250		D			
A147	Calidris ferruginea		120		D			
A149	Calidris alpina		2500		B	B	A	B
A158	Numenius phaeopus		70		D			
A160	Numenius arquata		150		C	C	C	C
A161	Tringa erythropus		40		D			
A169	Arenaria interpres		60		D			
A184	Larus argentatus	87-90			B	A	C	B

Code	Name	Population			Assessment of the importance of the area			
		Sedentary	Migrating		Population	Senior West.	Isol.	General
		Reproductive	Transient	Wintering				
A371	Carpodacus erythrinus	58-60			D			
A391	Phalacrocorax carbo sinensis		6500-12500	5000-10000	C	C	C	C
A608	Motacilla citreola	7-9			A	B	A	A

Characteristics of other forms of nature conservation located in the project vicinity are presented below.

The special protection area for birds "**Ujście Wisły" PLB220004** is located about 2.9 km south-east of the project. It covers a large fragment of the external Vistula delta from the mouth of the Vistula Śmiała to the Vistula diversion in Świbno, including the ornithological reserves "Mewia Łacha" and "Ptasi Raj". There is a mosaic of habitats including coastal lakes, patches of reed rushes, salt meadows and sand spits, cutting the lakes off from the Baltic Sea. There are at least 36 species of birds listed in Appendix No. 1 of the Birds Directive, 11 species from the Polish Red Data Book. During the breeding season the area is inhabited by at least 1% of the national population of: white tern, common gull and little ringed plover. The concentration of wetland birds exceeds 20,000 individuals. During winter, there is at least 1% of the migratory route of such species as: white-tailed eagle, tufted duck, goldeneye, long-tailed duck, common gull, common red-backed gull, and relatively high concentrations of: saddleback gull, common merganser, black-backed gull, long-tailed duck, and snowy plover. Nearly 530 plant species have been found in the area.

Special area of habitat protection "**Ostoja w Ujściu Wisły" PLH220044 -** according to SDF of the refuge : "includes the estuaries of Poland's largest river, the Vistula. They are also one of the largest and most important estuaries in Poland. Seven types of habitats from Annex I of Council Directive 92/43/EEC, constituting a typical complex of coastal sand plant communities, were found here. Despite heavy human pressure and significant transformation of the area, some plant communities associated with dunes in particular are well preserved here." The area also includes coastal waters, especially important for birds.

Special Area of Conservation "**Twierdza Wisłoujście" PLH220030** (approved by the European Commission on November 13, 2007). It includes a complex of brick and earthen fortifications from the 17th and 18th centuries, surrounding trees and water-filled moats. Bats winter in the basement of the fortress. Also important in terms of conservation are the areas surrounding the fortifications, which are optimal feeding grounds for these mammals. The area included in the Natura 2000 network is about 16 ha. The fortifications are located in the immediate vicinity of the promontory of Westerplatte, on the Martwa Wisła, near Port Północny. The Wisłoujście Fortress is the largest wintering site for *Chiroptera* bats in Gdańsk and the second largest in Pomorskie Voivodeship. According to the Standard Data Form, the subject of protection for this area is the winter population of *Myotis dasycneme* (species code 1318), estimated at 10-20 individuals. This population is part of a much larger, multi-species group of hibernating bats (up to 313 individuals, in recent years 96-194 individuals), also including Natterer's bat, Daubenton's bat, sporadically or exceptionally greater mouse-eared bat, whiskered bat, Brandt's bat, serotine bat, Nathusius's pipistrelle, brown long-eared bat and gray long-eared bat *Plecotus austriacus*. The maximum number of 11 individuals was observed (24.02.2005), but this species tends to hide in deep ceiling crevices. Results of the count conducted on 13.02.2013 showed the presence of 4 individuals of this species. The site is also an important autumn swarming site for bats - Natterer's bat, Daubenton's bat, and pond bat. Bat populations increased after the Fortress underground was no longer used as a warehouse.

Nature (ornithological) reserve "Ptasi Raj" with an area of 188.45 ha, located on the shore of the Gulf of Gdańsk, at the mouth of the Wisla Śmiała. Includes two overgrown eutrophic lakes. It lies on one of the main bird migration routes. The ornithological value of the reserve is determined primarily by the nesting of rare charadrii. It also provides a refuge for many seabird species and a resting place for birds during spring and fall migration. Currently, the avifauna of "Ptasi Raj" counts more than 200 species, of which 45 are nesting. The actual vegetation of the "Ptasi Raj" consists of a set of diverse communities - both aquatic and non-forested on land and forest on organic and mineral soil. This reserve is located within: Special Protection Area for Birds PLB220004 Vistula Mouth and Special Habitat Protection Area PLH220044 Ostoja in the Vistula Estuary. The reserve contains a mosaic of habitats, including freshwater, shallow lakes, vast patches of reed rushes, occurring in the coastal zone of the lakes and on former salt meadows, and sandy shoals, separating the lakes from the Baltic Sea. Significant portions of the area are occupied by dunes, covered with typical white or gray dune vegetation, in many places overgrown with various ages of pine crops, with a significant admixture of deciduous trees. A significant part of the Ptasi Raj reserve is occupied by alder cultivation, established on former salt meadows, now disappearing and transforming into shrub-rush communities. The most important reason for the decrease of the ornithological value of the reserve, which used to be much higher, was the cessation of cattle grazing and the consequent overgrowing of the salt meadows with reeds and their subsequent afforestation with artificially planted alders (despite the existence of the reserve). In the first half of the 20th century, nesting sites included the dunlin, ruff, wood sandpiper, common redshank and back-tailed godwit. Currently, there is a lack of habitat in the reserve for breeding of these species.

The **Tri-City Landscape Park** with an area of 19,930 ha includes the edge part of the moraine plateau in the vicinity of the Tri-City agglomeration. One of the most valuable natural features of the park is the unique postglacial relief, formed by processes associated with the North-Polish glaciation.

The Isle of Sobieszewo Protected Landscape Area covers 1,228 ha and includes a fragment of the Vistula Spit. Includes forested and upland areas and wetlands and floodplains. There is a zonal arrangement of dune vegetation (including pine forest), and in the Vistula estuary rush vegetation and stands of saltmarsh. The Ptasi Raj Reserve described above is located within this area. The coastal fragment of the Management Plan of Sobieszewo Island is included in the boundary of the SPA PLB220004 Estuary of the Vistula. It constitutes a fragment of the regional natural system of the coastal zone of the Gulf of Gdańsk region. It has its natural continuation in the form of continuous spit systems to the northeast.

The Żuławy Gdańskie Protected Landscape Area is located approximately 6.7 km south of the planned project area. This area of 30,092 hectares covers an alluvial plain - part of the Vistula delta, with a complex hydrographic system, including complementary types of drainage: gravity and polder. The natural environment is largely anthropogenic in origin and the landscape is cultural in character.

The ecological site **"Karasiowe Jeziorka"** is an area of 38.1 ha in the area of Kępna and Stogi Streets in Gdańsk. There are valuable plants and animals there, e.g.: the heath spotted-orchid, the quaking sedge, the spring sedge, adder's-tongue, medicinal leech, breeding birds such as hawk, grebe, common moorhen, black woodpecker, spotted and red-breasted flycatcher.

The ecological site "**Zielone wyspy in Górki Zachodnie**" encompasses an area of 32.96 ha and is the largest complex of riverside rushes within the city of Gdańsk. They have high ecological value (ecological niche of water birds, fish, insects) and landscape value. The "Green Islands" area is home to 86 species under strict species protection in the country.

The ecological site "**Wydma w Górkach Zachodnich**", has an area of 1.69 ha. It is the highest dune elevation with diversified vegetation within the Stogi Island in Gdańsk. The most valuable element is the psammophilic vegetation, there are also protected plants and animals; the dune is a unique habitat for birds. This area has great scenic value and is a viewpoint.

The ecological site **"Luneta z Pasikonikiem" ("Grasshopper's Lunette"**) of 0.81 ha, located in the area of the Napoleonic Forts, covering a fragment of the 18th-century earthen fortifications of Gdańsk, the so-called Senarmont's Lunette. There are valuable species of flora and fauna in the area: goldenrod (Solidago canadensis), feral fruit trees, mainly plum trees (Prunus spp.) and apple trees (Mallus domestica), and yellow-necked mouse (Apodemus flavicollis). The real treasure of the Senarmont Luneta are the insects, e.g.: the numerous population of the small grasshopper, the speckled bush-cricket (Leptophyes punctatissima).

The ecological site **"Prochownia pod Kasztanami"** with an area of 0.53 ha, located in the area of the Napoleon Forts, created to protect a patch of unused vegetation with localities of rare and protected plant and animal species. The utility is a hollow of land with several old chestnut trees (Aesculus hippocastanum) and a fragment of old brick fortifications, the so-called Prochownia Wojenna (War Gunpowder Storage). It is a wintering site for three species of bats - Natterer's bat (Myotis nattereri), Daubenton's bat (M. daubentonii) and greater mouse-eared bat (M. myotis). A very rare insect was found on the trunk of an old chestnut tree - a hymenoptera from the Sphecidae family, which makes its nests in the rotten wood. The species Crossocerus styrius was placed on the Polish Red List of Threatened and Endangered Animals.

The ecological site **"Fort Nocek"** with an area of 0.11 ha, located in the area of the Napoleon Forts at ul. 3 Maja, above the bus station, created in 1996 to protect a bat hibernation site.

The ecological site **"Murawy kserotermiczne w Dolinie Potoku Oruńskiego"** (Xerothermic grasslands in the Oruński Stream Valley) with an area of 2.88 ha, created in 1999, in the area of a fragment of the Oruński Stream valley, elevated to 49 m above sea level. The site was established in order to protect xerothermic grasslands, together with the richness of their flora and fauna. Bounded on two sides by erosional cuts with dirt roads and scrub. Slopes reach up to 40 degrees. There were found well-developed patches of xerothermic grasslands, 232 species of vascular plants, including a large group of thermophilous plants not found in other areas of our region.

The natural and landscape complex 'Dolina Potoku Oruńskiego' was established in 1999 by the Gdańsk City Council Resolution IX/321/99 of 29 April 1999. It is located on the area of 82.83 ha of the Oruński Stream Valley in Gdańsk. It was created in order to preserve the unique natural and landscape character of the erosion valley in the edge zone of the Gdańsk Plateau, and in particular to preserve in an unchanged form such elements as the watercourse, steep slopes of the former agricultural cultivation and specific flora.

The natural and landscape complex "Dolina Strzyży" was established in 2001 by the resolution of the Gdańsk City Council XXXIII/1024/2001 dated 29 March 2001. 381 ha of the Strzyża Valley in Gdańsk, in the buffer zone of the Tri-City Landscape Park. It was created in order to preserve the unique landscape values of the area and rich flora, while implementing the principle of building continuity of natural structures.

Taking into account the location of the planned project, the **nature connections of the southern part of the Natura 2000 area -** "Zatoka Pucka" require a more detailed consideration. The migration directions of water and wetland birds in this area, shown in the previous chapter, prove the existence of a strong functional connection of protected areas located in the vicinity of the shoreline of the Gulf of Gdańsk. There are movements of waterbirds between Natura 2000 sites: "Bay of Puck", "Mouth of the Vistula River", "Lower Vistula Valley", "Vistula Lagoon" and reserves (mostly located within the borders of the areas mentioned above): Kąty Rybackie (cormorant colony), Kępa Redłowska, Mechelińskie Łąki and Beka.

Considering at the supra-regional scale the natural connections of the Natura 2000 area "Zatoka Pucka" it should be noted that this area constitutes a fragment of the European waterfowl migration corridor between north-eastern Europe and wintering areas in western Europe.

Table 35 Natural values of Natura 2000 areas associated with avifauna of the analysed area

Name of Natura 2000 area	Natural value of the site and significance according to the Standard Data Form
Puck Bay PLB220005	"A bird refuge of European rank E 12. There are at least 28 species of birds listed in Appendix No. 1 of the Birds Directive, 11 species from the Polish Red Data Book. Nesting above 1% of the national population (C3) of the dunlin (schinzii) (PCK), common ringed plover (PCK) numbers up to 1% of the national population; until recently a ruff nested here. During the migration period, at least 1% of the

Name of Natura 2000 area	Natural value of the site and significance according to the Standard Data Form
	populations of the migratory route (C2 and C3) of great crested grebe, great horned grebe, tufted duck occur; relatively high concentrations (C7) are reached by: whooper swan, great crested swan, pintail, moorhen, redshank, dunlin, smew, black grouse, little Eurasian curlew, Eurasian curlew, great Eurasian curlew, eurasian oystercatcher, lapwing, plover, little ringed plover and barred warbler. During the winter at least 1% of the migratory route population (C2 and C3) of the following bird species occur: smew, tufted duck, goldeneye, common meganser, greater scaup, great crested grebe; relatively high concentrations (C7) of mute swan; wetland birds significantly exceed concentrations of 20,000 individuals (C4). “Ostoja w ujściu Wisły” area includes the estuaries of the largest Polish river, the Vistula. They are also one of the largest and most important estuaries in Poland. Seven types of habitats from Annex I of Council Directive 92/43/EEC, constituting a typical complex of coastal sand plant communities, were found here. Despite heavy human pressure and significant transformation of the area, some plant communities associated with dunes in particular are well preserved here."
Vistula Estuary PLB220004	A bird refuge of European rank E13. There are at least 36 species of birds listed in Appendix No. 1 of Directive 79/409/EEC and 11 species from the Polish Red Data Book. A very important wetland bird sanctuary in all seasons, especially during migration and winter. In total, at least 22 species of breeding wetland birds and at least 120 species of non-breeding wetland birds were found in the area. During the breeding season, the site supports at least 1% of the national population (C3 and C6) of the following bird species: common shelduck (PCK), oystercatcher (PCK), little tern (PCK), common tern, common gull, and common ringed plover (PCK); little ringed plover occurs in relatively high densities in some years. During the migration period, there is at least 1% of the migratory route population (C2 and C3) of the following bird species: black tern, Caspian tern, little gull, common gull and geese; relatively high concentrations (C7) are achieved by: tundra swan, red-throated loon, smew, ruff, common tern, arctic tern, sandwich tern, bar-tailed godwit, Eurasian curlew sandpiper, dunlin, red knot, spotted redshank, greater white-fronted goose, oystercatcher, common snipe, Eurasian Eurasian curlew, Eurasian curlew, wood sanpiper, lesser black-backed gull, sanderling, common ringed plover, grey plover, black-headed gull, Eurasian wigeon, red-breasted merganser; wetland birds occur in concentrations of more than 20,000 individuals (C4). During the winter at least 1% of the migratory route population (C2 and C3) of the following bird species occur: smew, tufted duck, common goldeneye, long-tailed duck, common gull, greater scaup; relatively high concentrations (C7) are reached by the great black-backed gull, common merganser, red-breasted merganser; wintering grounds of white-tailed eagle (up to 20 individuals) and the snow bunting (up to 120 individuals); wetland birds occur in concentrations of over 20,000 individuals (C4). The area is characterized by a great diversity of habitats; some of them are subject to dynamic transformations and arrange themselves in succession sequences, leading from pioneer beach communities to coniferous forest communities. Almost 530 taxa were found in the vascular flora. The most important plant species include 17 species legally protected in Poland and one species of salt aster tripolium, occurring on saline meadows and pastures on the Martwa Wisła and Wisła Śmiała, belonging to the group of species dying on a national scale. A very abundant population of Eryngium maritimum occurs in the area
Lower Vistula Valley PLB40003	"A bird refuge of European rank E 39. There are at least 44 species of birds listed in Appendix No. 1 of the Birds Directive, 4 species from the Polish Red Data Book. About 180 species of birds nest here. Very important refuge for migrating and wintering birds; very important wintering area for white-tailed eagles (C2). During the breeding season the area is inhabited by at least 1% of the national population (C3 and C6) of the following bird species: common merganser, common loon (PCK), little tern (PCK), common tern, common kingfisher, oystercatcher (PCK); corncrake, black-headed gull, and little ringed plover occur in relatively high density (C7). During migration, wetland birds occur in concentrations of up to 50,000 individuals (C4). During the winter, at least 1% of the migratory route populations (C2 and C3) of the following bird species occur: white-tailed eagle,

Name of Natura 2000 area	Natural value of the site and significance according to the Standard Data Form
	goldeneye, and common merganser; little ringed plover is relatively abundant (C7); wetland birds occur in concentrations of up to 40,000 individuals (C4). The avifauna of the area is not sufficiently understood. Rich fauna of other vertebrate animals, rich flora of vascular plants (about 1350 species) with numerous endangered and legally protected species, strongly diversified plant communities, including preserved different types of riparian forests, as well as valuable xerothermic grasslands. Species listed in section 3.3. with motivation D are legally protected species in Poland.
Vistula Lagoon PLB280010	"A bird refuge of European rank E 14. There are at least 27 bird species from the Annex I of the Birds Directive, at least 9 species from the Polish Red Book (PCK). During the breeding season, there is a red-crested pochard (1-3 pairs) (PCK) - 1%-3% of the national population, a grelag goose - about 1% of the breeding population, common shelduck up to 10% of the breeding population, more than a flathead c. 1% of the breeding population, great crested grebe over 1% of the breeding population, grey heron over 8% of the breeding population, black-headed gull over 1% of the breeding population, Savi's warbler - over 1% of the breeding population, white-tailed eagle over 1% of the breeding population; in relatively high abundance (C7) are: Eurasian bittern (PCK), little bittern (PCK), white stork, garganey, Eruasian teal; feeding c. 10,000 pairs of cormorants from a nearby breeding colony (the largest in Poland - 50% of the national breeding population) in Kąty Rybackie;. During the migration period, at least 1% of the population of the migratory route (C2 and C3) of the following species occur: smew, teal, white-fronted goose, tufted bean goose, tufted duck, head and little gull; relatively high concentrations (C7) are attained by whooper swan (up to 200 individuals), mute swan (up to 3,500 birds moulting, probably the largest swan bedding in the country), golden-eye (up to 3,000 separate) and mute swan. During the winter at least 1% of the population of the migratory route (C2) of the smew (up to 3200 individuals) and the European herring gull occur; relatively high concentrations of the Canada goose (up to 1300 birds, the only known permanent wintering site in Poland) and the hen harrier (up to 35 individuals) occur in the winter.

6.6.6 Other areas with special environmental conditions

The planned project is located outside:

- forested areas,
- wetlands under the Ramsar Convention,
- mountain areas,
- areas adjacent to lakes,
- areas with shallow groundwater,
- areas of protection zones of water intakes and protection areas of inland water reservoirs,
- areas with landscapes of historical, cultural, or archaeological significance,
- health resorts and health protection areas.

6.7 Monuments and cultural landscape

Due to the specific nature of the project location (transitional waters marine basin), potentially historic sites should be considered in terms of marine archaeology. The area of the planned project has not yet been covered by detailed studies of possible monuments lying on the bottom of this basin.

Therefore, in order to determine the cultural potential of the investment area, the data of the Polish Maritime Museum in Gdańsk (Pomian 2012) were used, referring to research conducted mainly within the mouth of the Martwa Wisła river and Port Północny, in the vicinity of the planned investment.

The Port Północny area in Gdańsk is located within the historical approach to the port of Gdańsk, which dates back to at least the 9th century. The first discoveries of historical objects in this area were connected with dredging works carried out in the 1970s. Among other things, a shipwreck (typologically dated to the end of the Middle Ages) was destroyed. Another find reported by the PRCiP was the perfectly preserved structure of the wreck of a wooden vessel resting under a nine-meter layer of sediment at the eastern breakwater of the harbour. This wreck was also destroyed by ongoing dredging operations. In the following years at least two more historic wrecks were destroyed, of which only the remnants of a horizontal capstan could be preserved. The study of sailing ships from this area was the focus of CMM underwater archaeologists in the 1980s and 1990s (Smolarek 1976,1987, Rutecki 2011).

In 2007 this area was included in the MACHU project "Managing Cultural Heritage Underwater" (MACHU) impelmented by the Polish Maritime Museum in Gdańsk within the framework of the KULTURA 2000 program in 2007 - 2009 (I. Pomian 2008).

Investigations within the framework of this program were carried out within the so called "Gdańsk" test area located in the southern part of the Gulf of Gdańsk at the mouth of the Vistula River, between the entrance to the port of Gdańsk and the western breakwaters of Port Północny - thus encompassing the vicinity of this port complex. The area of the "Gdańsk" test area is about 35 km^2 and its dimensions are about 5.5 x 6.5 km. It extends from the shore to a water depth of about 17 m.

The area so delimited covers only the underwater part of the estuarial cone of the Vistula Martwa. The underwater part of the estuarial cone of the Vistula Dead Vistula is located in the foreground of the sea shore in the area of Port Północny and Westerplatte, in the place where the main estuary of the Vistula functioned until 1840.

Since 1840, when the mouth of the Vistula Śmiała was created and the transport of sediments to the mouth in Gdańsk ceased, the cone has been subject to intensive erosion processes. The blurring of the cone in the test area caused wrecks that may have been in the area to be destroyed after 1840 and stranded on the seafloor. Most likely for this reason, no historic wrecks have been identified here to date. The wrecks identified so far within the test area (W-21, W-23, W-25) lie on the western side of the entry breakwater to the port of Gdańsk. Throughout the history of the development of the estuary cone of the Martwa Vistula, including after 1840, the processes of sediment accumulation conducive to the preservation of wrecks prevailed in this area.

The preserved cone sediment layer, on the east side of the breakwaters, potentially contains artifacts most likely from the medieval period. Plans for archaeological exploration of historic wrecks should also consider the landward part of the mouth cone of the Vistula Martwa, where buried wrecks or their remnants may occur in the sediments.

As part of the MACHU project, the Department of Operational Oceanography of the Institute of Oceanography, Gdańsk, Poland, performed hydroacoustic profiling (multibeam sounder, side scan sonar, sediment profilers) on profiles with a total length of 300 km in the area of interest.

The work carried out did not lead to the location of the monuments. The search was continued with the help of the Navy hydrographic units and the Maritime Office in Gdynia. As a result of this work, five wrecks of historic sailing ships were located in the area, as well as the remains of an approach fairway guard in the form of a wooden palisade tentatively dated to the 17th century (Ossowski 2011).

In 2011 the project "Inventory of wrecks in the area of entrance to the port of Gdańsk" was realized within the program of the Ministry of Culture and National Heritage Cultural Heritage, priority Protection of Archaeological Monuments. The result was preliminary archaeological documentation of five sailing shipwrecks located west of Port Północny breakwater. These wrecks have been dated by dendrochronology to the 15th - 18th century (Ossowski 2011).

Another source of information were archival materials held in the Scientific Library of the Polish Academy of Sciences in Gdańsk. Based on a search conducted by Dariusz Kaczor, Ph.D., it is reasonable to assume that more such objects lie in the harbour area. In the years 1611-1695, according to historical data, 8 ships were sunk in the area of the approach to the port of Gdańsk, 2 ships in the vicinity of Wisłoujście, 1 ship in the area of Krakowiec and 1 ship in the area of Stogi.

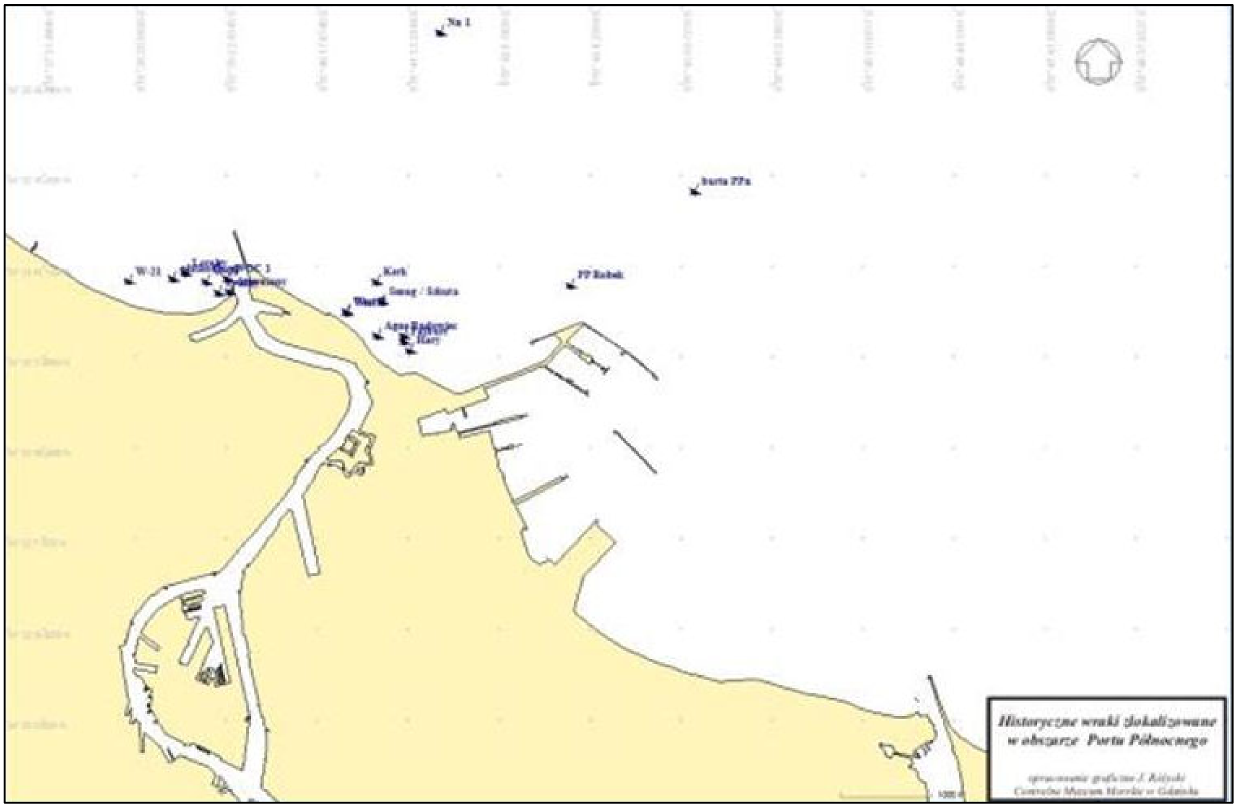

Figure 101 Location of historic wrecks located in Port Północny area
(Pomian 2012, CMM in Gdańsk)

Table 36 Inventory of Underwater Archaeological Sites

Name	no. EPSA*	Latitude	Longitude	Dating
Oval	F53.14	54° 24’ 36.1611” N	018° 39’ 24.0000” E	
PPn side	F53.16	54° 25’ 18.0001” N	018° 44’ 12.0000” E	
Nn 1	F53.13	54° 26’ 11.6301” N	018° 41’ 33.8900” E	
Flat-bottomed	F53.12	54° 24’ 40.8401” N	018° 38’ 56.0300” E	
Wooden	F53.11	54° 24’ 36.9601” N	018° 39’ 30.9000” E	
W-25	F53.3	54° 24’ 40.0693” N	018° 39’ 16.5659” E	18th c.
Loreley	F53.4	54° 24’ 43.1833” N	018° 39’ 3.6899” E	19th century
W-21	F53.5	54° 24’ 39.3133” N	018° 38’ 29.2979” E	17th century
Rudowiec	F53.15	54° 24’ 23.2113” N	018° 41’ 17.6499” E	17th century
Kerk	F53.17	54° 24’ 41.9001” N	018° 40’ 60.0000” E	16th/18th centuries
West A	F53.18	54° 24’ 30.8001” N	018° 40’ 42.5000” E	18th/19th centuries
West B	F53.26	54° 24’ 31.2581” N	018° 40’ 42.2020” E	17th century
Smug	F53.20	54° 24’ 35.2201” N	018° 41’ 3.5900” E	16th century
Hary	F53.21	54° 24’ 17.9901” N	018° 41’ 21.8000” E	17th century
Falburt	F53.22	54° 24’ 21.2801” N	018° 41’ 17.9690” E	15th century
PP Robek	F53.23	54° 24’ 42.9501” N	018° 42 58.3400” E	
Agne	F53.24	54° 24’ 22.7701” N	018° 41’ 1.5600” E	
WOC 1	F53.25	54° 24’ 41.6001” N	018° 39’ 29.3000” E	

<u>In conclusion, it should be stated that:</u>

- The area of the planned project is located beyond the cultural objects identified so far lying on the seabed.
- According to the results of research carried out in the vicinity of the project, the Port of Gdańsk area is a rich archaeological basin of the Polish Baltic coast.
- Taking into account a significant area occupied by the planned investment (over 130 ha), one can therefore expect the occurrence of archaeological monuments.

6.8 Land use and development

The planned investment for the expansion of the DCT (Terminal T 3) includes land for port and storage functions. These areas are currently part of the water body of the Gulf of Gdańsk. They have not been developed so far, but they constitute the direct back-up facilities of Port Północny and are functionally connected with it.

The planned project will be located in the southern part of the Bay of Gdańsk, in the immediate vicinity of the existing and operating DCT facility. As a functional whole, Port Północny is used in a variety of ways. Next to the existing container terminal (former DCT) there are reloading quays (cf. Figure 102):

- liquid fuels (PERN);
- coal,
- LPG;
- universal piers.

Therefore, from the southern and western side, the planned investment is in direct contact with anthropogenically transformed areas, intensively used for various port functions.

The area of the planned project as marine waters, not subject to the planning activities of the Municipality of Gdańsk, has no function assigned in the planning documents prepared by the city. The maritime area was not covered by the current Study of Conditions and Directions for Spatial Development, adopted by Resolution No. LI/1506/18 of the Gdańsk City Council on April 23, 2018. As it results from this document, on the land backside of the planned investment, in the eastern direction (towards Stogi beach) a further direction of port functions development has been determined. Therefore, the planned investment will relate to the strategic development plans of Port Północny, as specified in this document.

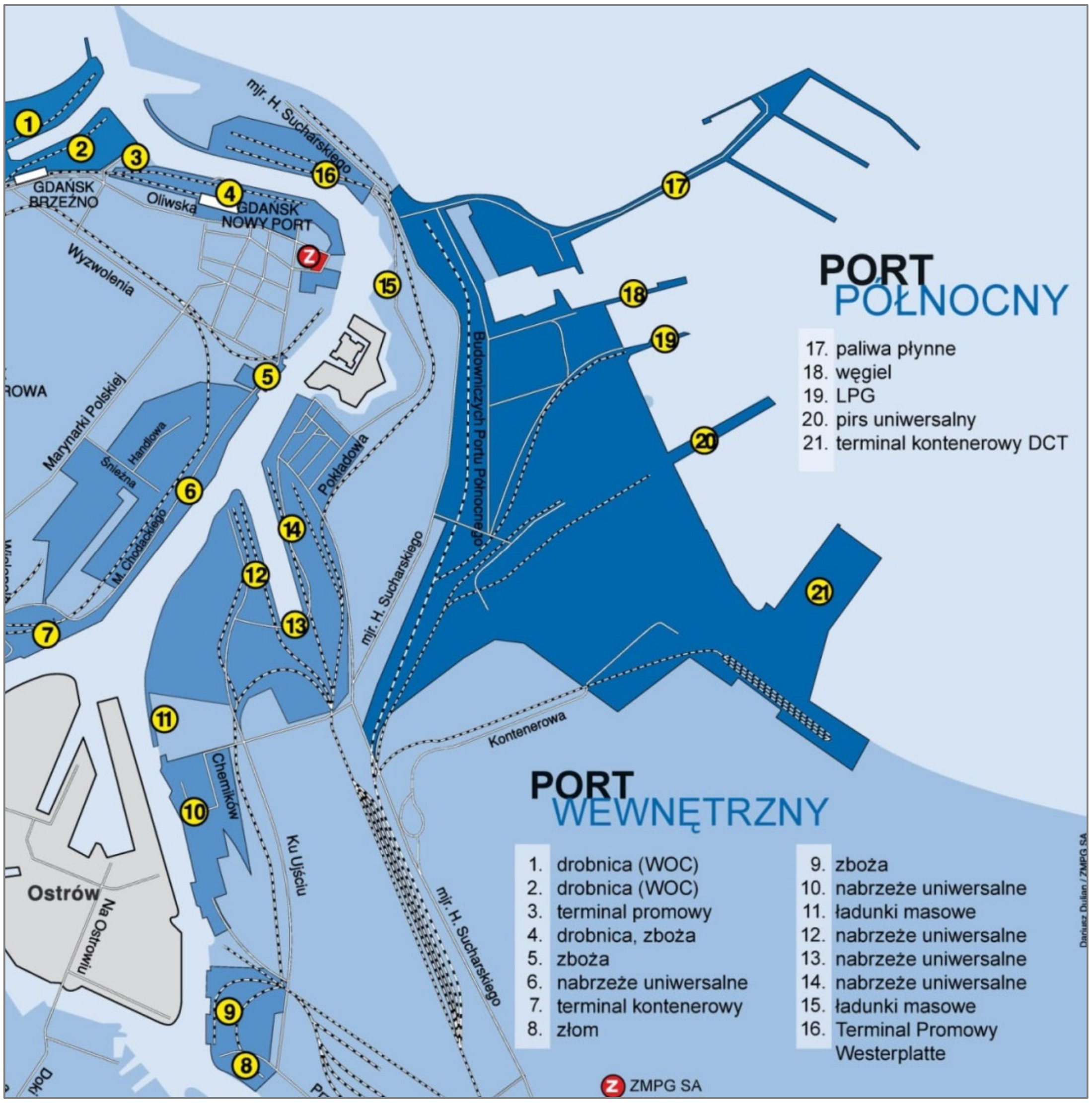

Figure 102 Map of Port of Gdańsk S.A.
[source: website of the Port of Gdańsk Authority S.A.]

Due to the large-scale and industrial nature of the project, as well as the further landward surroundings, it is also important to consider existing and planned land uses in the further surroundings of the planned terminal, especially on the eastern side - the landward hinterland.

To the east of the subject project, the land area includes:

- a recreationally used beach
- Stogi bathing site
- tourist and recreational development - accommodation services (campsites), catering and an arranged parking lot for beachgoers in Stogi (Figure 103).

The coastal areas used for recreation are located relatively close to the planned investment:

- the designated Stogi bathing site - is located approximately 610 m from the wharf of the planned terminal,
- the nearest beach entrance with seasonal facilities (trash receptacles, etc.) is approximately 670 from the planned waterfront.

The area of planned dredging is entirely outside the designated bathing site, at a minimum distance of approximately 330 m.

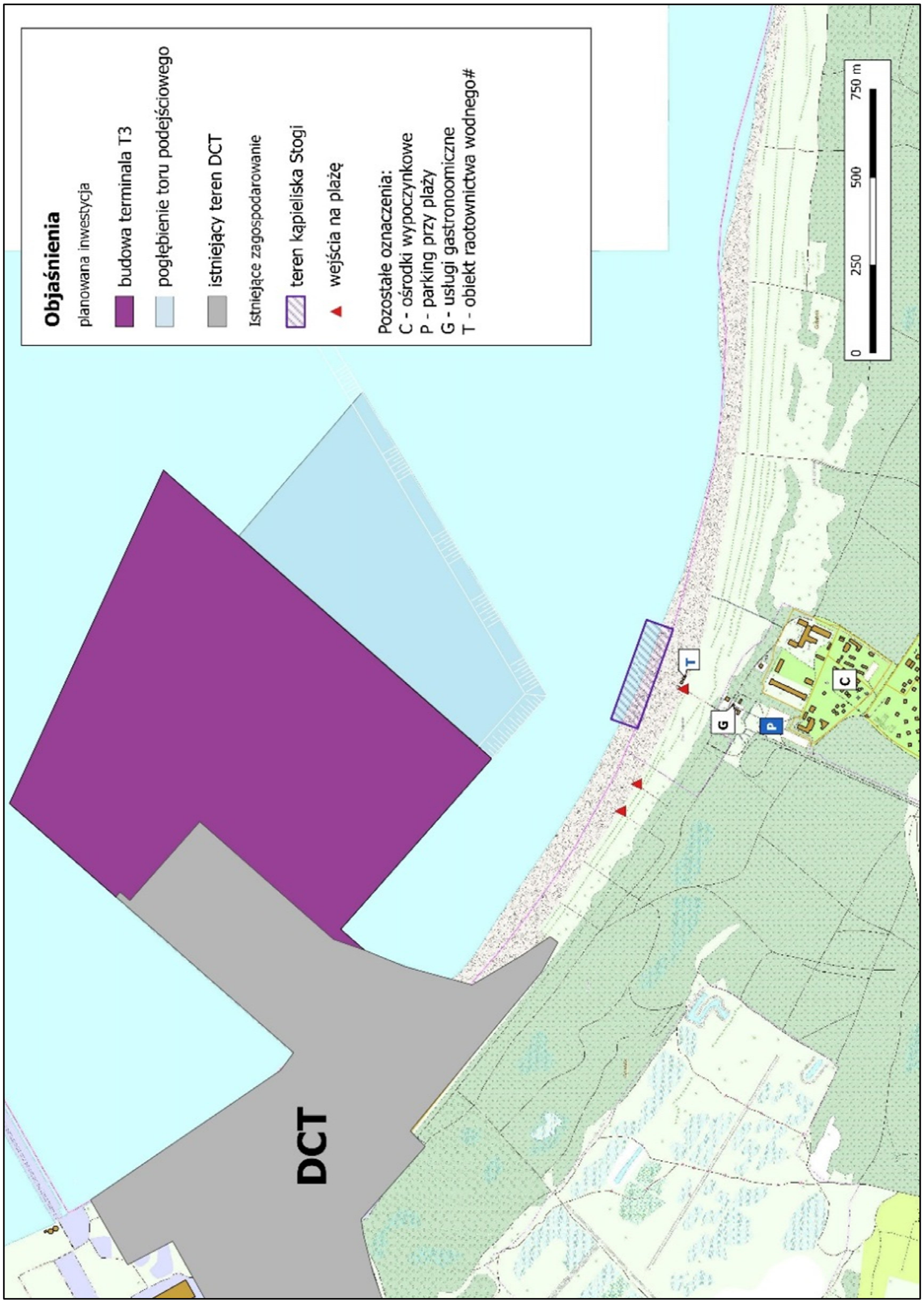

Figure 103 Location of the planned investment against the background of the tourist and recreational development in the area of Stogi beach.

Photo 6 Resort at the back of the beach in Stogi.

Photo 7 Service facilities in the vicinity of the main entrance to the beach in Stogi (entrance no. 26).

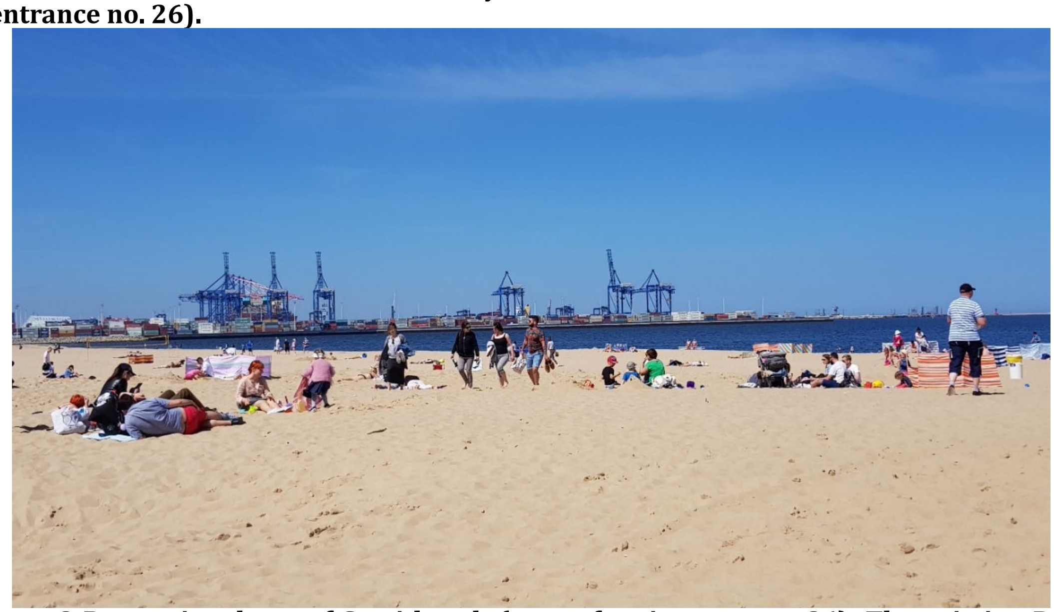

Photo 8 Recreational use of Stogi beach (area of main entrance 26). The existing DCT terminal in the background.

According to the 2018 City of Gdańsk Spatial Development Conditions and Directions Study, the land to the southeast of the proposed development has functions:

- beach (recreation area),
- secondary services (areas of tourist and recreational services at the main entrance to the beach in Stogi),
- (OSTAB - System of Biologically Active Areas) - a strip of forested dunes at the back of the beach.

6.9 Landscape

The direct investment area is a fragment of the open landscape of the Gulf of Gdańsk, in the coastal part, but not including the sea shore itself. The distance to the shoreline is over 300 m. Further away from the shoreline, there are visible anthropogenic elements in the landscape in the form of an internal breakwater - located approximately 850 m from the current DCT pier (terminal T 1). To the northwest, there are more breakwaters of Port Północny in Gdańsk, connected with piers (a distance of over 1.7 km).

Therefore, the landscape of this part of the Gulf of Gdańsk should be regarded as highly transformed and intensively developed port landscape, closed by the above-mentioned anthropogenic objects. There is currently no landscape opening to the Gulf of Gdańsk area.

The following landscape units can be distinguished in the terrestrial surroundings of the planned project:

- a complex of berths, equipment and port buildings of Port Północny (including the existing DCT) - directly adjacent to the investment area from the southern and western side;
- dune shore landscape, with beach, white and gray dune shafts, and a strip of pine forest on the dunes - extending east and southeast approximately 350 to 500 m from the planned T3 terminal pier.

The port complex of Port Północny forms a zone of an outstanding industrial and industrial-storage landscape, strongly transformed, with a complete lack of natural elements (cf. Figure 104). At the same time, some of the elements of the existing DCT, such as large cranes and port gantries, are strong landscape dominants, enhancing the impression of a strong transformation of the physiognomy of the seaside landscape, especially in the absence of other, natural height elements, which constitute the cover.

On the other hand, the terrestrial hinterland in the dune landscape zone has a distinctly different character. It has preserved natural features, there are no significant anthropogenic transformations, and the existing and visible elements of tourist and recreational buildings (rescue base and medical point) at the main entrance to Stogi beach have preserved proportions and dimensions, fitting it well into the surroundings of the beach strip and dunes. This part of the coastline can be regarded as a well-preserved fragment of the typical dune coastal zone of the Gulf of Gdańsk with high landscape values.

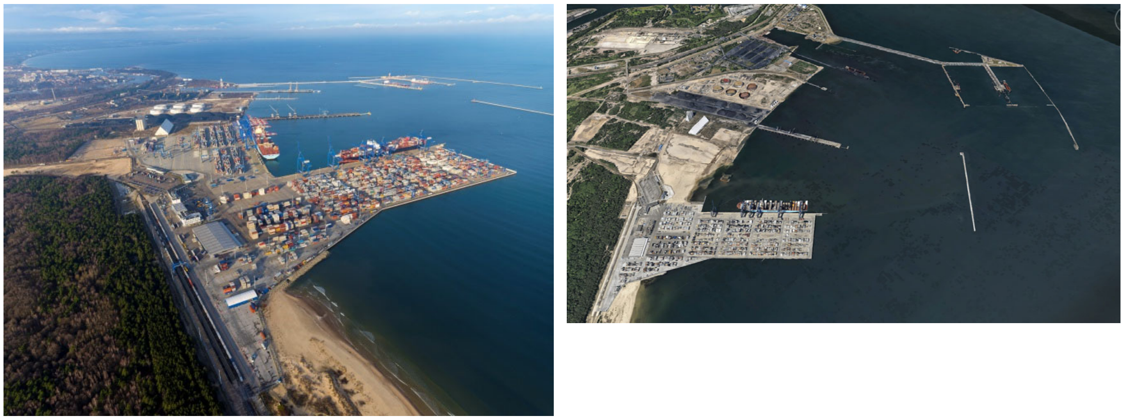

Figure 104 Landscape of the basin in the area of the planned project and the onshore facilities
Source: DCT/fot.aeromedia.pl and Google Earth {access:14.05.2018}

Photo 9 Panoramic view from the beach in Stogi (the area closest to the port of the entrance to the beach) in the north-east direction to the existing DCT quay (T1).

Photo 10 Landscape of a dune shore with a beach with natural features east of the proposed project.

The development of Port Północny, and in particular the DCT Container Terminal in the years 2004-2007, has significantly changed the landscape of the analysed part of the Stogi Island coastline. In place of the beach and wooded dunes and part of the reservoir, wharves and storage yards and cubic objects were built, as well as communication infrastructure (access road, internal roads and railroad track).

Photo 11 Panoramic view from Stogi beach (area of main entrance to Stogi beach - no. 26) in north-eastern direction to existing DCT quay (T 1).

Currently, the view opening from Stogi to the sea in the northwest direction is dominated by elements of the industrial and infrastructural landscape of the existing DCT berth. Specific, highly visible features include a loading quay, moored container ships, cranes, and storage yards.

6.10 Tangible goods

The project area is a marine area that has not yet been developed. No tangible goods are present. The possibility of material cultural heritage objects on the seabed is discussed in a separate chapter.

There are material assets in the vicinity of the proposed project that are development elements of the existing T 1 terminal. Equipment such as reloading cranes and cranes, buildings, storage yards, and equipment are integrally related to the terminal's reloading activities and after its expansion will become elements functionally related to the planned investment. As such, no adverse impacts to physical assets are anticipated.

6.11 People's living conditions. Impact on the population

The area for the planned project is located within the marine basin of the Gulf of Gdańsk. The nearest land areas, both in terms of current development and designation in planning documents, are the areas performing industrial, storage and service functions. Also for the strip of land to the south-east of the planned investment (towards Stogi) not yet developed for industrial functions, in accordance with the new Study of Conditions and Directions of Spatial Development of the City of Gdańsk (Resolution No. LI/1506/18 of the Gdańsk City Council of 23 April 2018), the direction for further development of port functions was set.

Areas that may be affected by the proposed project in terms of impact on human living conditions include:

- areas of residential development connected with permanent human residence;
- recreational and tourist areas - used mainly in the summer season.

The nearest residential development is located approximately 1.7 km south of the planned project in the Stogi district, in the area of Pusty Staw. Much closer are the recreational use areas. Such include:

- the designated bathing site in Stogi - is located approximately 610 m from the quay of the planned terminal (approximately 330 m from the area of the planned dredging works),
- Stogi sea beach - the nearest beach entrance with seasonal facilities (trash garbage cans, etc.) is about 670 m from the planned pier, while the strip of beach currently used for recreation is at a minimum distance of about 430 m from the edge of the planned terminal and about 340 m from the dredging area
- recreation areas in the area of Stogi - the nearest existing ones are located at a distance of approx. 850 m from the terminal and respectively approx. 720 m from the dredging site.

The current living conditions of the residents of Stogi, relating to the state of the environment in places of permanent residence and within recreational areas, should be considered good. There are no hazards associated with exceeding acceptable environmental quality standards.

An important aspect affecting the living and leisure conditions of people in this area is the wide availability of coastal areas for recreation (walking, bathing, sunbathing, games and fun). It can be considered that these functions have so far been only slightly constrained by the existing port development. In practice, the beach is not available for recreation of residents only in the area limited by the mesh fence, covering the strip of beach at a distance of up to about 330 m from the existing DCT terminal[26] (although the area under the management of ZMPG covers the beach stretching even further east than the current customary boundary). In the vicinity of the DCT, the impact on human recreational conditions should be considered primarily from the standpoint of impacts on feelings associated with the immediate vicinity of a large industrial facility, which influences the negative perception of the recreational landscape among some recipients, regardless of the actual state of the quality of its components (acoustic climate, air pollution, water purity). It certainly affects the attractiveness of the recreational space and the comfort of people's rest, and it is worth noting that even a cursory analysis of the opinions of tourists from all over the world about the various types of attractions associated with a stay at the beach shows that there is also a group of recipients for whom a beach overlooking the industrial background will be a greater attraction than a beach surrounded by wildlife.

Potential conflicts that the implementation of the planned project may cause in the social context are discussed in the chapter devoted to the analysis of these conflicts.

[26] It is also a natural mitigation area with no trespassing.

7 Description of predicted effects on the environment if the project is not undertaken

The lack of implementation of the project consisting in postponement or non-implementation of the T3 terminal in Port Północny in Gdańsk should be considered in various aspects with a diverse range - from international, through national, regional, to local.

According to the policy of the European Union, Poland should strive to relieve the pressure on land transport routes, especially in east-west routes, by intensifying sea transport. This effect can only be achieved if projects such as Terminal T 3 are realised, linking the TEN-T Baltic Sea with the motorways of the Baltic Sea, the North Sea and the Mediterranean, and with the capacity to handle goods from Asian markets. As a result, the rapidly growing demand for container transport nationwide and at the interface with neighboring countries will be met with less environmental impact along the national transport routes - rail and road. There will also be an increase in the share of container freight transported by rail, transported within the country and on international relations.

Thus, the T3 terminal project is in line with the EU guidelines for the development of the trans-European transport network established, inter alia, by Decision No. 661/2010/EU of the European Parliament and of the Council of 7 July 2010 and other documents. The planned Terminal is connected in a synergic and complementary way with other important investments implemented within the TEN-T network. These include:

- Priority Project No. 23 Railway axis Gdańsk - Warsaw - Brno/Bratislava - Vienna, listed in Annex III to the cited EU Decision,
- Master Plan for the Development of the BASIS Baltic Marine Motorways - Project No. 2006-EU-93017-S, in which the participants are: Poland, Denmark, Sweden, Finland, Estonia and Lithuania,
- reconstruction of the national road S7 Gdańsk - Warsaw (in connection with the Southern Bypass of the City of Gdańsk),
- planned modernization of the E 65 railroad line on the route: Gdynia - Tczew - Bydgoszcz - Inowrocław - Katowice - Tarnowskie Góry - Pszczyna (state border).

These projects will contribute to the creation of an economically and functionally beneficial network effect, but will also be of significant social and environmental importance. The social effect is the sustainable development of a modern transport infrastructure based on intelligent systems, and an increase in attractive jobs. The environmental effect is a gradual evolution in the rapidly growing transport of containers towards sea-rail instead of road transport.

The national and regional effect - definitely politically and economically disadvantageous - would be the abandonment of the possibility of forming in Gdańsk the main container handling hub in the South Baltic region of key importance for the functioning of transport in Central and Eastern Europe, serving not only transport from domestic partners, but also from Lithuania, Latvia, Belarus, Ukraine, Slovakia, the Czech Republic, and eastern Germany.

Resignation from the construction of T3 terminal in Port Północny in Gdańsk would mean lack of possibility of locating this investment not only within the Polish coast, but also in the whole South Baltic Sea. The reason is the access to the port basin that allows arriving of container ships with a draft of up to 16 meters (400 meters long, 60 meters wide). Such conditions are available only in Port Północny, which already handles the largest E-class vessels.

Resignation from further development of DCT Gdańsk and lack of response to the increasing demand for container reloadings would also thwart the goals and directions of transportation and labour market development set out in the Pomorskie Voivodeship Spatial Development Plan 2030. They would also lower the rank and role of Gdańsk as a seaport of fundamental importance to the national economy.

Not undertaking the project, i.e. not constructing the T3 Terminal locally, would result in a slight reduction in the environmental pressure caused by the construction and operation of this terminal in port waters. The abandonment of the project would have no impact on the functioning of the environment and the formation of natural relations in the area of Port Północny, and even less on the scale of the Gulf of Gdańsk and the Pomorskie region. The lack of interference and transformation of a small area and reservoir located within the port and industrial areas would not cause significant changes in the functioning of the environment in the environment of the planned project.

Not undertaking the project would limit the use and advisability of part of the access infrastructure to the port, currently implemented by the maritime administration (part of the new approach fairway to Port Północny, new breakwaters), and justified, among other things, by the needs for development of port areas where the T 3 terminal is proposed to be located.

The area planned for the construction of terminal T3 is a port area under the responsibility of the Port of Gdańsk Authority SA. The development plans of the Port of Gdańsk provide for the development of port and industrial areas in this area. The designation of this area for the function related to port, transhipment and warehousing activities has been provided for in local spatial development plans. The nature of the nuisance associated with the operation of the entire DCT Terminal is typical of industrial/port operations and has a relatively low level of impact compared to those currently occurring.

8 Identification of Impacts of the Option Proposed for Implementation

The expansion of the DCT Container Terminal will result in a permanent transformation of the environment by inundation of up to 95 ha of the sea basin and dredging of approximately 38 ha of the sea basin. Impacts associated with the operations phase of the DCT Container Terminal include changes in traffic patterns and volumes on surrounding roads and emissions of exhaust fumes and noise from operating vehicles and other Terminal equipment. Impacts of significance during the DCT operation phase will be limited to the Investor's land and immediately adjacent land.

8.1 Land area

8.1.1 Construction phase

Implementation of T 3 will result in the creation of a new piece of land area within the boundaries of the Gdańsk Seaport that will be developed for port functions. The new land area will be approximately 95 hectares. The created land area will then be used for work - as on land - by construction and other machinery that will shape and strengthen the land for the port terminal. The hazard during the construction period is associated with the operation of equipment (consuming diesel fuel and lubricants) used for excavation, construction and installation work, etc. Incidentally, a small leakage or spill of hazardous substances (lubricants, oils, gasoline, etc.) and local soil contamination may occur, but such events will be covered by the emergency response system, spills along with part of the contaminated soil will be collected in containers and transferred to authorized recipients in procedures consistent with the Waste Act.

As part of the dredging of the approach fairway, dredging will be performed. The volume of dredging works within the planned project was estimated at 4 million $m^{3.}$ In contrast, inundation of the 95 ha sea basin, which currently has an average depth of about 7 m to the terminal pier level of 3 m above sea level, will require filling a volume of about 10 million m^3 with earth and rock masses, construction materials, reinforcing elements, etc. Aspects related to dredging, dredge spoil extraction, dredge spoil utilization or dredge spoil disposal are discussed elsewhere in this report.

8.1.2 Operation phase

Impacts to the land surface during the operational phase of the DCT Container Terminal, including T3, will be insignificant. The surface of the area will be paved, and the area intended, for example, for containers with hazardous substances will be additionally secured. The area will be developed in accordance with the port and industrial functions envisaged for it, it will be tidied up, and the introduction of sealed, hardened surfaces in the communication areas will minimise the risk of pollution or contamination of the ground.

As a result of the investment a new development of the sea basin will take shape. At the exploitation phase, the designed project will not have a negative impact on the ground surface and will not exert any further influence on the land surface.

The area around the facilities where vehicle traffic takes place and transport equipment works will be under increased influence of vehicle exhaust fumes, dust emissions caused by vehicle traffic (wear and tear of pavement, tires and metal parts of cars and equipment) and chemicals used for winter maintenance of roads and other surfaces (they include: sodium chloride NaCl, calcium chloride $CaCl_2$ and magnesium chloride $MgCl_2$). Salts contained in de-icing chemicals are carried as an aerosol to roadsides.

During normal operation of the T 3 Terminal, its impact on land surface and soils will be negligible because the land surface within the Terminal will be largely paved and sealed (wharf, and roads). The water will be discharged in a controlled manner via storm sewer after treatment to the harbour water. The storage areas will not be sealed, but the application of IMDG, ADR, RID procedures referred to, inter alia, in the chapter "Environmental impact in case of emergencies, including a major industrial accident and other hazards, including a natural or construction disaster" ensures a sufficiently high level of prevention of ground contamination and, in case of an accident, an appropriate way of responding and removing the effects of the accident, including those effects which could lead to ground contamination.

8.2 Impact on hydrogeological conditions and groundwater

8.2.1 Construction phase

Due to the location of the planned project in the marine area, there will be no direct impacts on groundwater.

The planned deepening works taking place in the upper part of the Vistula delta sedimentary cover will not cause any changes in the isolation of deep aquifers (Cretaceous horizon) and will not endanger the quality and quantity of its resources. Removal of a part of sandy marine and deltaic sediments during dredging will not substantially affect the conditions of ascensional drainage of the Cretaceous horizon in the area of the Gulf of Gdańsk. The seepage conditions from the Cretaceous horizon to the sea water are mainly shaped by the layers of hard-permeable till and silt lying at much greater depths in relation to the planned dredging.

The area of the Gulf of Gdańsk is a zone of ascensional drainage of waters of the Cretaceous horizon (subdominant inflow of groundwater to the sea). The difference in hydrostatic pressure means that there is no risk of seawater contaminants entering the groundwater of this level. Therefore, the potential for contamination of deeper groundwater layers is not anticipated. Due to hydrographic conditions, there is also no possibility of surface water pollution.

8.2.2 Operation phase

Operation of the expanded terminal will not be associated with:

- introduction of pollutants into groundwater or soil.
- increased groundwater withdrawals.

Therefore, there will be no direct impacts on the hydrogeological environment, quantitative and qualitative groundwater resources occurring in the onshore hinterland in the area of the proposed project.

At the stage of operation, rainwater from the area of the planned investment will be discharged directly into the sea waters. Impacts to surface water are discussed in detail in the next section. Regardless of that, the project area is located in the groundwater drainage zone through the Gulf of Gdańsk. Therefore, conditions do not exist for the infiltration of contaminants from marine waters into aquifers. Therefore, the operation of the planned terminal, including the discharge of rainwater to the sea, as well as the occurrence of a potential emergency situation and seepage of pollutants from the berths or port basins into the sea water will not have a negative impact on groundwater quality.

8.3 Water and sewage management and rainwater and snowmelt

8.3.1 Construction phase

During earthworks and construction works there may be a temporary disturbance of local water relations and a threat of pollution from the construction site; however, these will be short-term, low-range impacts. Disturbance of water relations may deteriorate the conditions for stability of existing engineering structures located in the immediate vicinity of the works, so this type of risk should be taken into account in the construction and detailed designs.

The potential threat to surface water will be associated with the discharge of rainwater into the harbour waters of Port Północny, therefore special caution and safety and construction supervision procedures must be followed during the works.

During implementation of T 3, including underground infrastructure, there may be temporary disruption to existing water relations. This will be a short-term impact that will cease once the excavations are closed. No industrial wastewater will be generated.

Construction and installation activities will be conducted on unpaved and unsewered land, so rainwater will soak into the ground and will not be separated as wastewater requiring special management.

Sanitary wastewater will be generated during construction of the T 3 terminal. Their number will be proportional to the number of people employed. Wastewater generated in sanitary facilities such as toilets, washrooms, and showers will be transferred to the existing sanitary sewer network and then to Port Północny wastewater treatment plant. The quality of this wastewater will be consistent with the typical composition of municipal wastewater.

Adverse impacts to harbour water quality during construction of the project, may be caused by:

- siltation due to soil erosion during construction of the pier (damage mostly occurs during excavation and in the surrounding area) as well as due to washing out of fine sand fractions from the rock material that will be used for seawater filling,
- leaching of hazardous compounds from materials used in construction,
- the discharge of significant amounts of suspended solids from the construction site (lime meal) into surface waters,
- the discharge of petroleum products from machinery and vehicles into water.

As a result of construction and dredging activities, the release of heavy metals from the sediments will increase. However, due to the sandy nature of the sediments, concentrations are currently low.

No industrial wastewater will be generated at the site during the course of the work. There will also be no facilities that are a source of groundwater or surface water pollution.

In the event of spillage of petroleum products from machinery or vehicles, the construction site must be secured against the entry of harmful substances into water and the ground (e.g. with desiccant mats).

Proper implementation of the project will be associated with the observance of strict technological regimes, the use of high quality equipment and construction materials.

It is planned to drain rainwater from impervious surfaces through storm sewer outlets in the quay wall. They will be treated for mineral suspended solids and petroleum pollutants before being discharged to Bay waters. With proper engineering, impacts to harbour waters will be negligible.

During and shortly after dredging and dredge spoil disposal on the offshore dumping site, the amount of suspended solids as well as biogenic substances and organic matter will periodically increase due to the re-suspension of bottom sediments, which will result in increased turbidity, decreased transparency and deteriorated oxygen conditions of the water in the area of dredging.

The movement of suspended solids in the basin will follow the water currents and the direction of the works. Hydrodynamic conditions, the susceptibility of the dredged material to spreading, and the location of the disturbance area support the conclusion that periodic turbidity may occur to the northeast or northwest of the work site. From the chemical studies of the sediments so far, there is a low degree of contamination and a low content of clay fraction, so there is no risk of transfer to marine waters during the suspension phenomenon.

The waters of the Gdańsk Bay will also be potentially threatened by contamination with petroleum substances from vessels and dredging equipment. After the dredging is completed, the re-suspension of bottom sediments will cease and the concentrations of physico-chemical indicators will return to their previous state (including turbidity, biogenes, oxygen, etc.). Also, the amount of suspended solids that can be generated by watercraft movement (depending on the depth of submersion, swimming speed, and types of sediments on the bottom) will return to the original state. Similar impacts, but on a much smaller scale, will occur during maintenance work associated with maintaining the technical parameters of the Terminal basin.

It is anticipated that sand from dredging will be fully utilized to flood the water surface provided for construction of T 3.

8.3.2 Operation phase

The water is used for social and domestic purposes, is fed to ships and can be used for washing. Sewage is discharged into the port sewerage system which is at the disposal of ZMPG SA. In 2017, DCT used about 12.5 thousand m^3 of water from the water supply network at the disposal of ZMPG. After the expansion of the DCT terminal to the full extent, all 3 stages T 3, it can be expected that the annual water consumption will not exceed the value of 25 thousand m^3.

Water is also needed for firefighting purposes. The water source for the fire is a fire water tank fed from the harbour water supply. Above ground and underground hydrants will be used. The maximum distance of hydrants according to PN-B/028663:1997 will be $L_{max} < 150$ m.

Domestic and process wastewater at T 3 will be generated in the cubic facilities, with process wastewater being defined as wastewater from surface washing, etc. This wastewater will be discharged to the port sanitary sewer system. Sanitary sewage from vessels will be collected directly from the vessels by floating or wheeled equipment and therefore will not be included in the wastewater balance.

Only rainwater and snowmelt will be generated at the terminal site and after treatment will be discharged into port waters. The amount of surface runoff stormwater that will be generated by stormwater runoff, melting snow and ice depends on the intensity and duration of precipitation and the terrain. The stormwater system includes drainage of impervious surfaces, yard surfaces, and roof slopes of the Terminal facilities, with non-hazardous cargo container storage areas paved but not impervious to provide surface retention and prevent unnecessary stormwater flows. Rainwater generated will be directed to the storm drain system and then to the harbour waters through storm drain outlets in the wharf wall or breakwater and other shoreline structures. Due to technological requirements, pavement drainage will be accomplished primarily with linear drains. Before being discharged into a receiving tank, rainwater from impervious surfaces will be subjected to pre-treatment (suspended solids settling tanks, including sand and separators) with respect to mineral suspended solids and oil-derived pollutants. Similarly, this is currently the case under the water permit issued to DCT **(Appendix 8.3-1**) and the effluent quality results indicate compliance by a wide margin. Examples of survey results from recent months are included in **Appendix 8.3-2**.

The direct vicinity of the sea makes the discharge of rainwater not a technical problem, but only requires the proper selection of sewer network elements, the adoption of appropriate pipe dimensions, good gradients (or the adoption of a pressure system) and appropriate purification devices. These are basically already just technical issues with little environmental significance. However, to illustrate the issue, the amount of waste water that will be generated at the new Terminal site can be approximated using the formula:

$$Q = \Psi_u \cdot q \cdot A \ dm^3/s$$

where:

Ψ_u - averaged surface runoff coefficient = 1.0 (maximum coefficient was assumed, but leaking storage areas were excluded from the catchment area)

q - the authoritative rainfall intensity = 130 $dm^3/(ha\text{-}s)$

A - catchment area = 47.5 ha (half of the terminal area was assumed to be paved but unsealed storage area).

Therefore, the amount of stormwater generated at the new T 3 terminal site will be by calculation:

$$\mathbf{Q = 6\ 175\ dm^3/s}$$

For the exploitation phase it is assumed to create a procedure for dealing with leakage of hazardous substances (as a result of unsealing, etc.) from containerized cargo into the storm water drainage system. The procedure will be moved from the existing terminal area to T 3. The procedure should be fully implemented on the day the T 3 terminal is placed in service.

In addition to rainwater, firewater from the fire tank and the backflow isolator chamber in the amount of $Q_{max=}$ 20 dm^3/s will be directed to the stormwater drainage system.

Stormwater will be discharged to harbour waters through no more than 35 outlets located in the wharf, breakwater, or other shoreline structures. Outlets will be spaced appropriately in relation to the catchments from which rainwater is collected. Outlet diameters will be tailored to the specific design of the sewer network.

In conclusion, it should be stated that rainwater after discharge through the stormwater drainage network will meet the requirements of the Regulation of the Minister of Environment of 18 November 2014 on the conditions to be met when introducing sewage into the waters or into the ground, and on substances particularly harmful to the aquatic environment. This amount of treated rainwater, meeting the quality requirements, discharged from the DCT Terminal site to the port water will not have a negative impact on the water environment, as rainwater flowing into the marine environment is a natural process occurring in nature and the solutions applied in the existing Terminal and planned to be applied in the new Terminal do not interfere with this process.

The creation of T 3 may require reconstruction of the storm drain system at the T 1 terminal. If this is the case, this issue will be addressed in a separate project that is functionally related to project T 3.

8.4 Impact on ambient air

8.4.1 Air quality

The current state of atmospheric pollution (background level) in the analysed area was determined based on measurements and emission level estimates provided by the Provincial Inspectorate of Environmental Protection in Gdańsk - letter dated April 20, 2018. (Appendix 8.4-1). Other substances - 10% of the reference value - Table below).

Table 37: Summary of reference and background values of atmospheric pollution

Substance	CAS	D1, μg/m³	Da, μg/m³	R, μg/m³
PM-10 particulate matter	-	280	40	25
particulate matter PM 2.5		-	20	12
sulphur dioxide	7446-09-5	350	20	5
Nitrogen oxides as NO2	10102-44-0.10102-43-9	200	40	15
carbon monoxide	630-08-0	30000	-	500
ammonia	7664-41-7	400	50	5
benzene	71-43-2	30	5	3
Lead	7439-92-1	5	0.5	0.1
benzo(a)pyrene	50-32-8	0.012	0.001	0.001
Aromatic hydrocarbons	-	1000	43	4.3
Aliphatic hydrocarbons	-	3000	1000	100

8.4.2 Construction stage

During the construction phase, impacts to ambient air would be short-term and limited in extent. Emission sources will be diesel-powered construction machinery and vehicles on the flooded portion and on the reservoir.

With a planned dredged volume of approximately 4 million m^3 and an estimated dredger capacity of 1000-1500 kW of about 2000m^3/h, the extraction of the planned volume will be possible within 2000 hours of dredger operation. In addition, pile drivers with a total capacity of up to 250 kW, a 600 kW tugboat and a crane (max. 250 kW) and construction equipment and machinery (total max. 500 kW).

For the calculation of emissions from the above units, average emission factors developed by PENTEKO s.c. were used[27]which are [g/kWh]:

- oxides of nitrogen - 3.52
- nitrogen dioxide - 0.704
- dust - 0.18
- carbon monoxide - 3.5
- aliphatic hydrocarbons - 0.48
- aromatic hydrocarbons - 0.113
- benzene - 0.007

For the calculations, it was assumed that 100% of the dust is PM2.5. Emissions and characteristic volumes are summarized in the table below.

[27] *"Calculation of emission factors of gaseous and particulate pollutants for engines of non-road vehicles and equipment taking into account the structure of the car fleet in Poland and Europe"*, PENTEKO s.c., 2014

Table 38: Characteristics of emission sources and emitters - construction phase

Item	Source of pollution	Emitter No	Emitter characteristics					Substance	Emission	
			Emission time [h/year]	Emission source height [m]	Emission source diameter [m]	Speed temperature [m/s]	Temp [K]		Max. [kg/h]	Annually [Mg/a]
1.	Dredger 1500 kW installed power	P	2000	20	0.30	5	453	nitrogen dioxide carbon monoxide PM2.5 aliphatic hydrocarbons aromatic hydrocarbons benzene	1.056 5.250 0.270 0.720 0.170 0.011	2.112 10.500 0.540 1.440 0.340 0.022
2.	Pile drivers 8 pieces per shift 250 kW installed power	K	1000	25	0.15	5	453	nitrogen dioxide carbon monoxide PM2.5 aliphatic hydrocarbons aromatic hydrocarbons benzene	0.176 0.875 0.045 0.120 0.028 0.002	0.176 0.875 0.045 0.120 0.028 0.002
3.	600 kW tugboat	H	200	7.0	0.15	5	453	nitrogen dioxide carbon monoxide PM2.5 aliphatic hydrocarbons aromatic hydrocarbons benzene	0.422 2.100 0.108 0.288 0.068 0.004	0.084 0.420 0.022 0.058 0.014 0.001
4.	Auxiliary equipment 250 kW crane	D	5000	7.0	0.15	5	453	nitrogen dioxide carbon monoxide PM2.5 aliphatic hydrocarbons aromatic hydrocarbons benzene	0.176 0.875 0.045 0.120 0.028 0.002	0.880 4.375 0.225 0.600 0.140 0.010
4.	Construction Equipment & Machinery Total power 500 kW	SB	5000	2.0	0.10	0	453	nitrogen dioxide carbon monoxide PM2.5 aliphatic hydrocarbons aromatic hydrocarbons benzene	0.352 1.750 0.090 0.240 0.057 0.004	1.760 8.750 0.450 1.200 0.285 0.020

In order to calculate the maximum 1-hour concentrations and the average annual concentration of pollutants for substances emitted from the area of the planned project, a simulation was carried out using the OPERAT FB program. The input data for the calculations are presented in Appendix 8.4-2.

8.4.2.1 Shortened range

The table below shows the results of calculating the sum of the maximum concentrations.

Table 39: Classification of an emitter group on the basis of the sum of maximum concentrations

Pollutant name	Sum of concentrations max. [μg/m³]	Permissible concentration D1 [μg/m³]	Concentration calculation in the receptor network	Description
PM-10	137.0	280	TAK	0.1*D1<Smm<D1
Nitrogen oxides as NO2	**1072**	200	TAK	**Smm > D1**
carbon monoxide	5329	30000	TAK	0.1*D1<Smm<D1
benzene	11.49	30	TAK	0.1*D1<Smm<D1
Aromatic hydrocarbons	172.8	1000	TAK	0.1*D1<Smm<D1
Aliphatic hydrocarbons	731	3000	TAK	0.1*D1<Smm<D1
particulate matter PM 2.5	137.0	-		no assessment - no D1

8.4.2.2 Full range

In the full scope, receptor network calculations were performed for all emitters.

Appendix 8.4-2 presents the input data for the calculations in the receptor network and their results in graphical form (tabulograms only in electronic version due to their volume), while below is a summary of the obtained results (maximum values of concentrations outside the terminal area).

Table 40: Summary of maximum values of concentrations of PM10 and PM2.5 in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m³	15.7	3350	1050	6	1	WNW
Annual average concentration μg/m³	0.055	3250	1950	6	1	S
Exceedance frequency D1= 280 μg/m³, %	0.00	-	-	-	-	-

The highest value of one-hour concentrations of PM10/PM2.5 particulate matter occurs at the point with coordinates X = 3350 Y = 1050 m and is 15.7 μg/m³, this value is lower than 0.1*D1 (for PM10).

Zero frequency of exceedances of 1-hour concentrations.

The highest value of annual average concentration occurs at the point with coordinates X = 3250 Y = 1950 m, is 0.055 μg/m³ and does not exceed the disposition value (D_a-R)= 15 μg/m³ for PM10 and 8 μg/m³ for PM2.5.

Table 41: Summary of maximum nitrogen oxide concentrations in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction

Maximum concentration μg/m³	122.5	3350	1050	6	1	WNW
Annual average concentration μg/m³	0.432	3250	1950	6	1	S
Exceedance frequency D1= 200 μg/m³, %	0.00	-	-	-	-	-

The highest value of one-hour concentrations of nitrogen oxides occurs at the point with coordinates X = 3350 Y = 1050 m and is 122.5 μg/m³.

Zero frequency of exceedances of 1-hour concentrations.

The highest value of annual average concentration occurs at the point with coordinates X = 3250 Y = 1950 m, is 0.432 μg/m³ and does not exceed the disposition value (D_a-R)= 25 μg/m³.

Table 42: Summary of maximum carbon monoxide concentrations in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m³	609.4	3350	1050	6	1	WNW
Annual average concentration μg/m³	2.150	3250	1950	6	1	S
Exceedance frequency D1= 30000 μg/m³, %	0.00	-	-	-	-	-

The highest value of one-hour concentrations of carbon monoxide occurs at the point with coordinates X = 3350 Y = 1050 m and is 609.4 μg/m³, this value is lower than 0.1*D1.

Zero frequency of exceedances of 1-hour concentrations.

Table 43: Summary of maximum benzene concentrations in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m³	1.25	3350	1050	6	1	WNW
Annual average concentration μg/m³	0.0048	3250	1950	6	1	S
Exceedance frequency D1= 30 μg/m³, %	0.00	-	-	-	-	-

The highest value of one-hour benzene concentrations occurs at the point with coordinates X = 3350 Y = 1050 m and is 1.25 μg/m³, this value is lower than 0.1*D1.

Zero frequency of exceedances of 1-hour concentrations.

The highest value of annual average concentration occurs at the point with coordinates X = 3250 Y = 1950 m, is 0.0048 μg/m³ and does not exceed the disposition value (D_a-R)= 2 μg/m³.

Table 44: Summary of maximum aromatic hydrocarbon concentrations in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m³	19.7	3350	1050	6	1	WNW
Annual average concentration μg/m³	0.070	3250	1950	6	1	S
Exceedance frequency D1= 1000 μg/m³, %	0.00	-	-	-	-	-

The highest value of one-hour concentrations of aromatic hydrocarbons occurs at the point with coordinates X = 3350 Y = 1050 m and is 19.7 μg/m³, this value is lower than 0.1*D1.

Zero frequency of exceedances of 1-hour concentrations.

The highest value of annual average concentration occurs at the point with coordinates X = 3250 Y = 1950 m, is 0.070 μg/m³ and does not exceed the disposition value (D_a-R)= 38.7 μg/m³.

Table 45: Summary of maximum aliphatic hydrocarbon concentrations in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m³	83.6	3350	1050	6	1	WNW
Annual average concentration μg/m³	0.295	3250	1950	6	1	S
Exceedance frequency D1= 3000 μg/m³, %	0.00	-	-	-	-	-

The highest value of one-hour concentrations of aliphatic hydrocarbons occurs at the point with coordinates X = 3350 Y = 1050 m and is 83.6 μg/m³, this value is lower than 0.1*D1.

Zero frequency of exceedances of 1-hour concentrations.

The highest value of annual average concentration occurs at the point with coordinates X = 3250 Y = 1950 m, is 0.295 μg/m³ and does not exceed the disposition value (D_a-R)= 900 μg/m³.

The highest value of annual average concentration occurs at the point with coordinates X = 3250 Y = 1950 m, is 0.0553 μg/m³ and does not exceed the disposition value (D_a-R)= 8 μg/m³.

8.4.2.3 Summary

At the stage of implementation of the planned project, discharge of pollutants into the air will not cause exceedence of the conditions specified in the Regulation of the Minister of Environment of 10 January 2010 **on reference values for certain substances** in the air and will not cause exceedence of admissible values of substances in the air, specified in the Regulation of the Minister of Environment of 18 September 2012 **on levels of certain substances in** the air - emission of dust and gas pollutants into the air will not cause exceedence of air quality standards outside the plant. Predicted annual dust concentrations will be practically negligible and will represent, outside the terminal boundary, approximately 0.4-0.7% of the disposable values of the PM10 and PM2.5 particulate matter fractions.

<u>Air quality standards outside the terminal area will not be exceeded.</u>

In addition, the requirements set out in § 3 of Resolution No. 352/XXXIII/17 of the Sejmik of Pomorskie Voivodeship of 27 March 2017 **on updating the Air Protection Programme for the Tri-City Agglomeration zone, in which the admissible level of PM10 particulate matter and the target level of benzo(a)pyrene were exceeded** *(Dz.Urz.Woj.Pom. of 2013, item 4711)* in the scope concerning predicted processes in the area of the planned project at the stage of implementation and referring to the obligations and limitations for entities using the environment through the following solutions (citations from the above mentioned resolution are in italics):

4) wet cleaning of street surfaces - condition met: wet cleaning of paved area and construction exit area from soil/sand applied by vehicle wheels; wet cleaning of storage yards and traffic areas;

12) limitation of unorganised emission of dust from construction sites by storage of loose materials in silos, use of covers during works causing dusting and wet sweeping of the hardened area of the investment site - condition fulfilled: dust limitation by use of tarpaulins, covers and silos for storing dusty materials, use of covers during works causing dusting, cleaning vehicles leaving the construction site and wet cleaning of the hardened area and the area around the exit from the construction site from soil/sand on the wheels of vehicles;

14) reduce road pollution leading to fugitive dust emissions from vehicles leaving the construction sites - condition fulfilled: cleaning of vehicles leaving the construction site and wet cleaning of the paved area and the area around the construction exit from soil/sand on the wheels of the vehicles.

8.4.3 Operation stage

8.4.3.1 Source characteristics and emissions

Emissions from the existing part of the terminal (T1 and T2) were determined in accordance with the study "Air Protection Study - Annex No. 1" (compiled by the Ministry of Environment. Marczak A., Krakowiak S., Kosecka M., December 2016), which is an attachment to DCT Gdańsk S.A.'s application for a permit to introduce gases and dust into the air and notification of the installation (hereinafter "Study...").

Emission sources at the new T3 terminal site will include the following processes:

- combustion of gas in boiler rooms and heaters (in enclosed buildings),
- combustion of fuels in equipment and units and vehicles serving the terminal,
- fuel combustion in watercraft.

<u>Combustion of gas in boiler rooms and heaters</u>

The fuel used in the boilers and heaters will be natural gas with the following characteristics:

- calorific value 34.4 MJ/m3
- sulphur content 40 mg/m3

Emissions from boiler plants and heaters will be organized. Gas consumption for these purposes at the T3 terminal is expected to be a maximum of 200$^{m3/h}$and 250,000$^{m3/year}$. The table below shows the emissions from natural gas combustion for projected consumption. The emission factors were adopted in accordance with those recommended by KOBIZE for natural gas combustion[28].

[28] "Pollutant emission factors from fuel combustion, boilers with nominal thermal power up to 5 MW", IOŚ-PIB, Warsaw-, 2013 (for boilers 0.5-5 MW)

Table 46: Emissions from natural gas combustion

Pollutant name	Emission indicator	Maximum emission	Annual emission
	[g/m³]	[kg/h]	[Mg/a]
PM2.5/PM10 particulate matter	0.0005	0.0001	0.000125
Sulphur dioxide (SO_2)	0.08	0.016	0.02
Nitrogen oxides as NO_2	1.75	0.35	0.4375
Carbon monoxide (CO)	0.24	0.048	0.06

A substitute emitter **E-KG** with the following parameters was assumed for the calculations (the most unfavourable parameters of the existing emitter emitting fumes from natural gas combustion presented in the "Study..."):

- H = 6.0 m (covered)
- D = 0.35 m
- Ts = 450 K,
- Working hours per year - 5800 h/a.

<u>Power generator</u>

The power unit used for the calculations is analogous to the one currently in use at the terminal site and presented in the "Study...":

- Nominal capacity 340 kW
- Nominal heat output 780.8 kWt
- Fuel consumption B = 76.7 l/h (at 100% load)
- **E-AG** emitter parameters:
- H = 3.0 m (side)
- D = 0.08 m
- Ts = 343 K,
- Operating time per year - max. 40 h/a.

Table 47: Emissions from the generator set

Pollutant name	Maximum emission [kg/h]	Annual emission [Mg/a]
PM2.5/PM10 particulate matter	0.068	0.0027
Nitrogen oxides as NO_2	2.04	0.0816
Carbon monoxide (CO)	1.19	0.0476
Aliphatic hydrocarbons	0.340	0.0136

<u>Overhead cranes e-RTG, e-RMG</u>

The eRTG, e-RMG cranes, up to 95 in number, will be electrically driven. They will be additionally equipped with emergency power generators, which will secure the functionality of the cranes in case of power failure. Emission of pollutants will only occur during operation of the internal combustion engines of the emergency generators. The operating time was assumed to be 10 h/year for each crane.

Due to the use of emergency-only emission sources, one **E-RTG** surrogate emitter was assumed for the calculations to reflect the potential emergency operation of each crane for a total of 950 h/year (95 units x 10 h). The substitute emitter was located to simulate its impact in the centre of the square. The emitter parameters are specific to each crane:

- H = 25 m (side)
- D = 0.10 m
- Ts = 313 K

The emission levels of the cranes were assumed analogously to those of the e-RTG cranes currently operating at the T2 terminal and presented in the "Study...".

Table 48: Emissions from e-RTG, e-RMG cranes

Pollutant name	Maximum emission	Annual emission
	[kg/h]	[Mg/a]
Nitrogen oxides as NO_2	0.2880	0.2592
PM2.5/PM10 particulate matter	0.0288	0.02592
Carbon monoxide (CO)	0.5040	0.4536
Aliphatic hydrocarbons	0.0274	0.02466

<u>Container manipulation operations</u>

Container handling operations at the back of the 3 new berths will be supported by diesel-powered equipment such as tractors, elevators, and stackers. It was assumed that 80% of all vehicles owned by the Terminal could be operating simultaneously at any given time. Parameters of secondary emitters of **E-IMV(1-3)** fugitive emissions from these facilities:

- H = 2 m,
- Ts = 300 K,
- Work time: 5750 h/a.

Emissions for each of the 3 new Terminal T3 berths were determined analogous to emissions from the 220 hp Cummins engine powered equipment backing up to the Terminal T2 berth (emitter EN6).

Table 49: Emissions from container handling operations

Pollutant name	Maximum emission	Annual emission
	[kg/h]	[Mg/a]
Nitrogen oxides as NO_2	1.5641	2.8139
PM2.5/PM10 particulate matter	0.0196	0.0352
Carbon monoxide (CO)	2.7372	4.9243
Aliphatic hydrocarbons	0.1484	0.2673

<u>Parking for trucks and cars</u>

There will be truck parking for approximately 200 spaces and a multi-level parking garage for approximately 600 spaces.

Vehicle emissions for on-road traffic were calculated using the EMEP/Corinair B710 and B76 methodologies in the manual available on the European Environment Agency website[29]. Vehicle emissions calculations assumed traffic of 400 trucks and 1,200 passenger vehicles per day, for 365 days at 20 hours per day. Each vehicle in the terminal area travels a distance of 500 m. Secondary emitter parameters for **E-PD** fugitive emissions from these facilities:

- H = 3.5 m,
- Ts = 300 K,
- Work time: 7300 h/a.

For the aforementioned conditions, emissions from road transport in the area of the planned project will be:

Table 50: Fugitive emissions from vehicle traffic

Pollutant name	Emissions max. [kg/h]	Annual emission [Mg/a]
carbon monoxide	0.02204	0.1609
Nitrogen oxides as NO2	0.03054	0.2229
total dust	0.00341	0.02489
ammonia	0.000734	0.00536
sulphur dioxide	0.000349	0.002548
Lead	5,93E-6	0.0000433
Aliphatic hydrocarbons	0.00544	0.0397
Aromatic hydrocarbons	0.001414	0.01032
benzene	0.0000973	0.00071

Vessels

External emission sources integral to the operation of the Terminal will be incoming and outgoing vessels. Conceptual assumptions for the entire DCT terminal (T1-T3):

- 7-9 ocean-going vessels per week, the largest of which have a capacity of 20,000 TEUs,
- 35-55 feeder vessels per week, so-called feeder vessels with a capacity of 500-5000 TEU.

Sources of emissions will be vessel engines on the approach fairway and generators on vessels during unloading and loading. Engine emissions during entry and exit maneuvers were counted for 30% of engine power, generator sets emissions based on power information and amount of fuel consumed. Input data was used for the calculation of emissions from vessels, included in the "Environmental Impact Report of the project under the name: Construction of Container Terminal T 2 with capacity of 2,500,000 TEU in Port Północny in Gdańsk" (EKO-KONSULT, Gdańsk, 2013). The calculation assumes 400 ocean-going vessels of 18,000 TEU and 2,500 feeder vessels of 3,000 TEU per year.

[29] http://www.eea.europa.eu

The stay of the ship was divided into stages

- Stage I - about 1 hour - entering the Port, maneuvering, mooring;
- Stage II - a few to several hours - stay at quays (10 hours were assumed for calculations);
- Stage III associated with the ship's departure is similar in emissions to Stage I.

It has been assumed that ships will use two approach tracks to the terminal in a 1:1 ratio - the existing one on the northern side of the island breakwater and the designed one on the eastern side (the new eastern entrance after completion of the new breakwaters).

Emitter parameters for emissions from the **E-STP** and **E-STW** approach fairways:

- H = 30 m (ocean-going vessels), 20 m (feeder vessels),
- Ts = 330 K,
- Work time: 2900 h/a (ocean-going vessels - 400 h/a, feeder vessels - 2500 h/a).

Table 51: Emissions from ship maneuvering operations on fairways

Pollutant name	Maximum emission [kg/h]		Annual emission [Mg/a]	
	TEU 18000	TEU 3000	TEU 18000	TEU 3000
PM2.5/PM10 particulate matter	5.0360	0.8360	2.014	2.090
Sulphur dioxide (SO_2)	7.5540	1.2540	3.022	3.135
Nitrogen oxides as NO_2	29.2088	4.8488	11.684	12.122
Carbon monoxide (CO)	10.0720	1.6720	4.029	4.180
Aliphatic hydrocarbons	6.9245	1.1495	2.770	2.874
Aromatic hydrocarbons	3.1475	0.5225	1.259	1.306

It was assumed that vessels will use all five DCT berths proportionally after the expansion, with one vessel at a time.

Emitter parameters for emissions from ocean-going vessel aggregates **E-STO(1-5)**:

- H = 30 m,
- D = 0.5 m,
- V_0 = 5 m/s,
- Ts = 313 K,
- Work time: 800 h/a.

Emitter parameters for feeder vessel aggregate emissions **E-STF(1-5)**:

- H = 20 m,
- D = 0.5 m,
- V_0 = 5 m/s,
- Ts = 333 K,
- Work time: 5000 h/a.

Table 52: Emissions from generators at berths

Pollutant name	Maximum emission [kg/h]		Annual emission [Mg/a]	
	Ocean-going vessel	Feeder vessel	Ocean-going vessel	Feeder vessel
PM2.5/PM10 particulate matter	1.0050	0.5360	0.804	2.680
Sulphur dioxide (SO_2)	1.5060	0.8040	1.205	4.020
Nitrogen oxides as NO_2	5.0200	2.6800	4.016	13.400
Carbon monoxide (CO)	5.0200	2.6800	4.016	13.400
Aliphatic hydrocarbons	1.3805	0.7370	1.104	3.685
Aromatic hydrocarbons	0.6275	0.3350	0.502	1.675

8.4.3.2 Impact of the DCT terminal after implementation of the planned project

In order to calculate maximum 1-hour concentrations and annual average concentrations of pollutants emitted from the DCT terminal area after expansion (T1-T3), a simulation was performed using OPERAT FB program. Calculation inputs along with emitter locations from the "Study..." are presented in **Appendix 8.4-3**. The emission period breakdown used in the "Study..." was applied. Only substances emitted from the planned project were considered.

The table below shows the results of calculating the sum of the maximum concentrations.

Table 53: Classification of an emitter group on the basis of the sum of maximum concentrations

Name pollution	Sum of concentrations max. [μg/m³]	Permissible concentration D1 [μg/m³]	Concentration calculation in the receptor network	Description
PM-10	**437**	280	YES	**Smm > D1**
sulphur dioxide	**442**	350	YES	**Smm > D1**
Nitrogen oxides as NO2	**20821**	200	YES	**Smm > D1**
carbon monoxide	17423	30000	YES	0.1*D1<Smm<D1
ammonia	2.628	400	-	Smm < 0.1*D1
benzene	0.348	30	-	Smm < 0.1*D1
Lead	0.01061	5	-	Smm < 0.1*D1
Aromatic hydrocarbons	176.8	1000	YES	0.1*D1<Smm<D1
Aliphatic hydrocarbons	**3297**	3000	YES	**Smm > D1**
particulate matter PM 2.5	437	-		no assessment - no D1

<u>Full range</u>

In the full range, receptor network calculations were performed for substances for which the sum of maximum concentrations was above 10% of the D1 value (for PM2.5, the results are identical to those for PM10).

Appendix 8.4-3 presents the input data for the receptor network calculations and the results in graphical form (the figures show the maximum values at the terminal boundary), while a summary of the results obtained (maximum concentrations outside the terminal area) is presented below.

Table 54: Summary of maximum values of concentrations of PM10 and PM2.5 in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m³	52.9	1500	1100	6	1	NNE
Annual average concentration μg/m³	0.865	2400	2300	3	1	S
Exceedance frequency D1= 280 μg/m³, %	0.00	-	-	-	-	-

The highest value of one-hour concentrations of PM10//PM2.5 particulate matter occurs at the point with coordinates X = 1500 Y = 1100 m and is 52.9 μg/m³. Zero frequency of exceedances of 1-hour concentrations.

The highest value of annual average concentration occurs at the point with coordinates X = 2400 Y = 2300 m, is 0.865 μg/m³ and does not exceed the disposition value (D_a-R)= 15 μg/m³ for PM10 and 8 μg/m³ for PM2.5.

Table 55: Summary of maximum nitrogen oxide concentrations in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m³	**2581.1**	1500	1100	6	1	NNE
Annual average concentration μg/m³	10.923	2400	2300	5	1	SSW
Exceedance frequency D1= 200 μg/m³, %	0.20	2500	2300	4	1	WSW

The highest value of one-hour concentrations of nitrogen oxides occurs at the point with coordinates X = 1500 Y = 1100 m and is 2581.1 μg/m³.

The highest frequency of exceedances for one-hour concentrations occurs at the point with coordinates X = 2500 Y = 2300 m, is 0.20% and does not exceed the limit value of 0.2%.

The highest value of annual average concentration occurs at the point with coordinates X = 2400 Y = 2300 m, is 10.923 μg/m³ and does not exceed the disposition value (D_a-R)= 25 μg/m³.

Table 56: Summary of maximum carbon monoxide concentrations in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m³	1556.6	1500	1100	6	1	NNE
Annual average concentration μg/m³	11.073	2400	2300	6	1	S
Exceedance frequency D1= 30000 μg/m³, %	0.00					

The highest value of one-hour concentrations of carbon monoxide occurs at the point with coordinates X = 1500 Y = 1100 m and is 1556.6 μg/m³, this value is lower than 0.1*D1. Zero frequency of exceedances of 1-hour concentrations.

Table 57: Summary of maximum sulphur dioxide concentrations in the receptor network outside the terminal area

Parameter	Value	X	Y	crit.	crit.	crit.

		m	m	r.state	w.speed	w.direction
Maximum concentration μg/m^3	138.1	2400	3400	6	1	SSW
Annual average concentration μg/m^3	2.406	2400	2300	3	1	S
Exceedance frequency D1= 350 μg/m^3, %	0.00	-	-	-	-	-

The highest value of one-hour concentrations of sulphur dioxide occurs at the point with coordinates X = 2400 Y = 3400 m and is 138.1 μg/m^3. Zero frequency of exceedances of 1-hour concentrations. The highest value of annual average concentration occurs at the point with coordinates X = 2400 Y = 2300 m, is 2.406 μg/m^3 and does not exceed the disposition value (D_a-R)= 18 μg/m^3.

Table 58: Summary of maximum aromatic hydrocarbon concentrations in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m^3	57.5	2400	3400	6	1	SSW
Annual average concentration μg/m^3	1.001	2400	2300	3	1	S
Exceedance frequency D1= 1000 μg/m^3, %	0.00	-	-	-	-	-

The highest value of one-hour concentrations of aromatic hydrocarbons occurs at the point with coordinates X = 2400 Y = 3400 m and is 57.5 μg/m^3, this value is lower than 0.1*D1. Zero frequency of exceedances of 1-hour concentrations. The highest value of annual average concentration occurs at the point with coordinates X = 2400 Y = 2300 m, is 1.001 μg/m^3 and does not exceed the disposition value (D_a-R)= 38.7 μg/m^3.

Table 59: Summary of maximum aliphatic hydrocarbon concentrations in the receptor network outside the terminal area

Parameter	Value	X m	Y m	crit. r.state	crit. w.speed	crit. w.direction
Maximum concentration μg/m^3	441.4	1500	1100	6	1	NNE
Annual average concentration μg/m^3	2.513	2400	2300	3	1	S
Exceedance frequency D1= 3000 μg/m^3, %	0.00	-	-	-	-	-

The highest value of one-hour concentrations of aliphatic hydrocarbons occurs at the point with coordinates X = 1500 Y = 1100 m and is 441.4 μg/m^3. Zero frequency of exceedances of 1-hour concentrations. The highest value of annual average concentration occurs at the point with coordinates X = 2400 Y = 2300 m, is 2.513 μg/m^3 and does not exceed the disposition value (D_a-R)= 900 μg/m^3.

8.4.3.3 Summary

Functioning of the DCT terminal after the expansion (T1+T2+T3) will not cause exceedence of the conditions specified in the Regulation of the Minister of Environment of 10 January 2010 **on reference values for certain substances** in the air and will not cause exceedence of admissible values of substances in the air, specified in the Regulation of the Minister of Environment of 18 September 2012 **on levels of certain substances in** the air - emission of dust and gas pollutants into the air will not cause exceedence of air quality standards outside the plant.

It should be emphasized that a significant share of emissions from this area will be fugitive in nature, coming primarily from the movement of vessels and diesel-powered container handling equipment and machinery, and their range is limited to the DCT area. In the case of the planned project it is foreseen to use entirely electrically powered overhead cranes, from which emissions will only occur in case of power failure and the need to run the generators installed on them.

8.5 Noise impact

8.5.1 Substantive basis for acoustic analysis, decisions, and source materials

Source and regulatory materials that formed the basis for performing the acoustic analysis:

- Regulation of the Minister of Environment of 14 June 2007 on the Permissible Noise Levels in the Environment (Dz. U. of 2014, Item 112),
- Polish Standard PN-ISO 9613-2 Acoustics. Sound attenuation during propagation in the open space. General method of calculation,
- SoundPLAN 7.4 computer program with calculation algorithm according to the above mentioned standard,
- Report on the environmental impact of the project named: Construction of Container Terminal T2 with capacity of 2 500 000 TEU in Port Północny in Gdańsk - prepared by Design and Consulting Office EKO-KONSULT in Gdańsk,
- Concept for construction and land development of T3 Container Terminal in Port Północny in Gdańsk,
- Investigations and measurements of noise in the environment coming from devices - in the area of container port DCT in Gdańsk made by Environmental Center SANTE with headquarters in Gdynia, ul. Lazurowa 8 – March 2017,
- Investigations and measurements of noise in the environment coming from devices - in the area of container port DCT in Gdańsk made by Environmental Center SANTE with headquarters in Gdynia, ul. Lazurowa 8 – July 2017,
- Technological and traffic data concerning traffic service of the analysed project obtained from the Investor,
- Other data obtained from the Investor.

8.5.2 Purpose and scope of acoustic analysis

The purpose of the acoustic analysis is to determine the value and extent of noise emitted to the environment from the DCT Gdańsk container terminal in Gdańsk, ul. Kontenerowa 7 after the construction and commissioning of the T3 terminal.

The calculated value is the equivalent sound level corrected by the frequency A – $L_{Aeq\ T}$ curve. In accordance with the Act of 27 April 2001, the Environmental Protection Law used noise indicators applicable to determine and control the conditions of use of the environment in relation to one day:

- $\mathbf{L_{Aeq\ D}}$ – equivalent sound level A for the daytime defined as the interval from 6^{00} hrs to 22^{00} hrs (reference time interval equal to 8 least favourable hours of a day consecutively),
- $\mathbf{L_{Aeq\ N}}$ – equivalent sound level A for the time of night understood as the time interval from $22^{00\ \mathrm{to}}\ 6^{00}$ (reference time interval equal to 1 least favourable hour of night).

The range of impact was determined on the basis of distribution of values of the above mentioned indicators on the analysed area of the Container Terminal and its surrounding areas.

The scope of the acoustic analysis includes:

1. Identification and classification of noise sources of equipment and installations located in the area of the Container Terminal at ul. Kontenerowa 7 in Gdańsk:
   - ❖ a description and characterization of existing and proposed significant/significant noise sources,
   - ❖ determination of acoustic parameters of the above mentioned noise sources.
2. A computational analysis of noise emissions from classified noise sources, i.e. plotting the isolines of the equivalent sound level,
3. Assessment of the acoustic field image caused by the operation of the planned T3 terminal equipment and the existing noise sources inventoried at the operating T1 and T2 terminals in Gdańsk, ul. Kontenerowa 7,
4. Evaluate environmental quality standards for noise abatement at the boundary of the site being evaluated and at the boundary of existing residential development and recreational areas (protected functions).

The findings of this acoustic analysis are part of the environmental impact assessment of the planned project.

8.5.3 State of acoustic climate in the environment at the border of the assessed area

The main factor shaping the acoustic climate in the area of the Container Terminal is the industrial /port handling/, rail and road noise resulting from the transport service of the Terminal. Aircraft noise does not occur in this area.

State of acoustic climate in the environment

Environmental acoustic conditions at the boundary of the DCT Container Terminal site were last studied in 2017.

The assessment is based on the following studies:

1. Investigations and measurements of noise in the environment coming from devices - in the area of container port DCT in Gdańsk made by Environmental Center SANTE with headquarters in Gdynia, ul. Lazurowa 8 – March 2017,
2. Investigations and measurements of noise in the environment coming from devices - in the area of container port DCT in Gdańsk made by Environmental Center SANTE with headquarters in Gdynia, ul. Lazurowa 8 – July 2017.

The results of acoustic measurements in the environment - noise levels described in the studies cited above are summarized in the table below. They present the state of acoustic climate during normal operation of all Terminal plants. The acoustic climate state presented in the tables is presented independently for daytime and nighttime.

Table 60: Noise measurement results - 2017i

Measurement point no	Values of equivalent sound level in L_{Aeq} [dB]	
	Daytime	Night time
	Date of measurement 08.03.2017	
1	66.5	68.1
2	53.3	56.2
3	49.5	49.7
	Date of measurement 28.07.2017	
4	63.3	66.0

The results cited represent noise levels typical of industrial sites. The noise level at night is noteworthy - in three measurement points it is about 3 dB higher than the noise level during daytime. This trend is difficult to explain.

8.5.4 Determination of the permissible level of noise in the environment

The permissible noise level in areas with specific use and development method is currently determined in accordance with the provisions contained in Appendix 1 to the Regulation of the Minister of Environment on permissible noise levels in the environment.

Table 61: Permissible levels of noise in the environment caused by specific groups of noise sources, excluding noise caused by take-offs, landings and overflights of aircraft, as well as power lines

Type of area	Permissible noise level in [dB]			
	Roads or railroads		Other objects and activities as a source of noise	
	$L_{Aeq\ D}$ a reference time interval of 16 hours	$L_{Aeq\ N}$ a reference time interval of 8 hours	$L_{Aeq\ D}$ reference interval equal to 8 least favourable consecutive daytime hours	$L_{Aeq\ N}$ Reference interval equal to 1 least favourable night time hour
Protection zone "A" of the health resort Areas of hospitals outside the city	50	45	45	40
Single-family housing areas Areas of development connected with permanent or multiday stay of children and youth (*) Areas of social care homes Areas of hospitals in cities	61	56	50	40
Areas of multi-family housing and collective dwelling **Areas of farm buildings** **Recreation and leisure areas** **Residential and commercial areas**	65	56	**55**	**45**
Downtown areas in cities with over 100,000 residents	68	60	55	45

(*) In the event of non-use of these areas according to their function during the night, there is no acceptable noise level at night.

The Regulation defines the permissible values for the noise level expressed in the L_{AeqD} and L_{AeqN} indicators, which are applicable to the setting and control of the conditions of use of the environment in relation to one day.

The surroundings of the Container Terminal area include:

- from the north and east - the Gulf of Gdańsk;
- from the south side - a forest, and behind it, at a distance of about 2 km, multi-family housing development at ul. Wrzosy, belonging to the district of Stogi, and in the south-eastern direction at a distance of about 2 km holiday resorts at ul. Nowotna;
- from the west - forest and area of Port Północny.

Due to the aforementioned characteristics of the areas adjacent to the Container Terminal - in accordance with currently binding legal acts, i.e. the Regulation of the Minister of Environment on permissible noise levels in the environment - there are no legal grounds to determine the permissible noise level at the border of the Terminal area with these areas.

The nearest protected areas - the residential area of Stogi district and the beach and bathing site have a certain acceptable level of noise in the environment in accordance with the binding regulations. These are the areas for which the permissible levels of noise in the environment specified for the classification of land according to pt. 3 of Table 1, columns 5 and 6, i.e. for other facilities and activities being the source of noise in the amount:

- L_{AeqD} = 55 dB from 6 a.m. to 10 p.m. (daytime),
- L_{AeqN} = 45 dB from 22 to 6 /night time/ [not applicable to the beach and bathing site]

8.5.5 Characteristics of the noise sources inventoried and designed for the Container Terminal in Gdańsk, ul. Kontenerowa 7

The main task of the Container Terminal is unloading, temporary storage and loading of containers on sea and land transport. These include container ships operating regular lines from China and the Far East, local feeder container ships, rail and road transport.

Transportation vehicles and container handling equipment are the primary group of noise sources that determine noise emissions to the environment.

These devices and other objects located in the Container Terminal area were analysed in terms of their classification as potential noise sources, specifying their type, operation time and acoustic parameters.

When constructing a computational model of the Container Terminal, the shielding effect of containers located in the terminal storage yards was taken into account. Containers can be stored in 5 layers, the height of such a partition far exceeds the height at which most moving noise sources move. Container layers are natural containment and dispersion screens for acoustic energy. The height of the container layers was assumed to be h = 9 m.

Simultaneous operation of all inventoried significant noise sources during both daytime and night timehours was considered and assumed in the adopted model. Making such an assumption causes the forecast results to be inflated because simultaneous operation of all noise sources is unlikely.

The following primary types of noise sources were identified within the project area being evaluated:

- *stationary (indoor and outdoor),*
- *moving.*

I. Stationary noise sources are divided into:

- indirect noise sources, building type, where noise is generated by internal, technological equipment,

  The noise emission of indirect sources (building type) is characterized by the equivalent sound level [L_{Aeqwew} in dB], which occurs inside objects at a distance of 1 m from the exterior wall.

- direct point sources , i.e. equipment located outside buildings: fans, refrigeration and air conditioning equipment, etc.

- direct stationary point sources of noise at the Container Terminal also include the refrigeration units of containers that are cooled during their storage at the yard.

  Direct sources, i.e., external sources, are characterized by the sound power level [$L_{AW\ w}$ dB] and the time of source operation in relation to the reference period [T].

The tables below list the inventoried significant stationary sources along with their acoustic parameters.

Table 62: List of stationary indirect noise sources (type - building) - acoustic data

Building description	**L_{Aeqwew} [dB]**	**Operating time of the noise source in the normal reference time interval T**		**$L_{AeqwewT}$ [dB] day/night**	**Sound insulation index of external partitions (walls/roofs)** R_{A1} in dB
		Daytime (8 hours)	**Night time (1 hour)**		
workshop	85	16	8	85	30/30
fire pump room with power generator	85	16	8	85	30/30
gas boiler room	85	16	8	85	30/30
transformer station	80	16	8	80	25/25
workshop	85	16	8	85	30/30
fire pump room with power generator	85	16	8	85	30/30
transformer station (2 locations)	80	16	8	80	25/25

*** Designations in the table above:

L_{Aeqwew} – equivalent indoor sound level in [dB],

$L_{AeqwewT}$ – equivalent indoor sound level for the standard reference interval in [dB],

Noise emissions from the aforementioned buildings - indirect noise sources, due to their number and emission parameters, have no impact on the environmental impact of the Terminal - these sources were not included in the calculation model.

Table 63: List of stationary, direct, point sources of noise - acoustic power level

Description of source	LAW [dB]	Operating time of the noise source in the normal reference time interval T		L_{AWeq} [dB] day/night
		Daytime (8 hours)	Night time (1 hour)	
Refrigerated containers	90	16	8	90/90
air-conditioning and ventilation system on the roof of the administration building	90	16	8	90/90
roof fans - boiler house, pump house and workshop building	90	16	8	90/90

*** Designations in the table above:

L_{AW} - sound power level in [dB],

$L_{AW/T}$ - equivalent sound power level for the standard reference interval [dB].

Of the above sources, only the refrigerated containers will have a practical impact on noise emissions from the Terminal area due to their large, yet difficult to estimate, number. The presented concept envisages that such containers will be stored at a distance of approximately 235 m from the edge of the quay on the different parts of the designed T3 terminal. Containers can be stored up to a height of 5 layers. In constructing the computational model of the Container Terminal, it was assumed that the last highest layer chiller units would be important for noise emissions. Noise emissions of the lower layer chiller units will be attenuated by adjacent containers. As a result of this assumption, 63 noise sources corresponding to refrigerated containers were distributed in the model describing the Terminal. Each of these sources corresponds to the operation of two containers.

The remaining single direct stationary point sources such as fans and air conditioners do not affect the balance of noise emission to the environment and the picture of the acoustic field in the surroundings of the Container Terminal. These sources were also not included in the computational model.

II. Mobile, point and line sources of noise

Mobile sources of noise emitted to the environment from the Container Terminal area include all equipment for loading, unloading and movement of containers between modes of transport and on storage yards as well as road, rail and sea transport.

The existing T1 and T2 terminals are or potentially will be equipped with the following primary equipment, each of which is a point mobile noise source:

- STS type quay cranes (14 pieces);
- diesel and electric RTG gantry cranes (45 pieces);
- tractor-trailers for unloading and loading ships in Ro-Ro technology, moving containers between yards (91 units);
- lift trucks for solid containers (10 pieces);
- lift trucks for empty containers (8 pieces);
- diesel forklifts (14 units);
- hydraulic crane (2 pieces)

It was assumed that the designed T3 terminal will be equipped with the following maximum number of basic handling equipment:

- STS type quay cranes (27 pieces);
- RMG electric gantry cranes (96 pieces);
- truck tractors (189 units).

As an addendum, it was adopted:

- lift trucks for solid containers (5 pieces);
- lift trucks for empty containers (4 pieces);
- diesel forklifts (7 units);
- hydraulic crane (1 pieces)

Each of the aforementioned devices was modeled as a single point source of noise with the exception of the truck tractors, which due to their number were commingled so that one point source corresponds to three tractors.

The basic acoustic parameters of the above mentioned devices are listed in the table:

Table 64: List of moving, direct, point sources of noise - acoustic power level

Description of source	LAW [dB]	Operating time of the noise source in the normal reference time interval T		L_{AWeq} [dB] day/night
		Daytime (8 hours)	Night time (1 hour)	
quay crane type STS	87	16	8	87/87
gantry crane type RTG	87	16	8	87/87
gantry crane type RTG	85	16	8	85/85
gantry crane type RTM	85	16	8	85/85
tractor unit	90	16	8	90/90
lift truck for solid containers	90	16	8	90/90
empty container lift truck	90	16	8	90/90
diesel forklift	95	16	8	95/95
hydraulic crane	90	16	8	90/90

*** Designations in Table 3

L_{AW} - sound power level in [dB],

$L_{AW/T}$ - equivalent sound power level for the standard reference interval [dB].

Traffic volumes for truck, rail, and marine transportation were based on a forecast assuming a maximum capacity of 10 million for the Container Terminal after completion of the T 3 terminal. TEU annually. Road and rail transport would each handle 30% of the above-mentioned volume of containers, i.e. a maximum of 3 million each. TEU. This amount is many times in excess of the current handling, inbound, and outbound capacities of the Terminal, but was nevertheless used as the basis for developing and evaluating noise emissions.

Maritime transport

According to the investor's data, transport of this amount of containers will require handling 7 - 9 large vessels / container ships/ and 35 - 55 feeder ships per week. Based on the aforementioned data, it has been assumed that 8 large container ships and 46 feeder ships will arrive and depart the Container Terminal per week. The Terminal's operating program calls for ships to arrive via two routes - east and west. Assuming an equal load on both shipping lanes, a sound power level attributed to one vessel LAW = 110 dB, the estimated length of the shipping lanes, and the estimated speed of vessel movement - the estimated acoustic power level for the west fairway was L_{AWeq} = 95.5 dB and the acoustic power level for the east fairway was L_{AWeq} = 96.2 dB.

Rail transport

According to the adopted assumptions, the delivery to the Terminal and export of 3 million TEUs by rail transport during the year will require - with the adopted precautionary indicators - the activation of approx. 250 trains per day *(extreme values resulting from the precautionary approach have been assumed; the example actual number of trainsets handled by DCT in 2017 was 5,000, thus an average of 14 trains per day; assuming another indicator, which assumes that one train set allows the transport of 70-80 TEUs - we will get the result of 102 trains per day in order to export 3 million TEUs during the year; therefore, the adopted indicators result in a greater impact, and therefore if compliance with the requirements is demonstrated for the adopted indicators, even more so for the values indicating a smaller scale of transport)*. Assuming a train sound power level of LAW = 98 dB, the length of the rail siding in the Terminal area, and the estimated speed of train traffic on the siding, the equivalent rail transportation sound power level of L_{AWeq} = 97 dB was calculated.

Car transport

Delivery to the Terminal and removal by road transport /trucks/ of 3 million. TEUs per year will theoretically require the arrival and departure of 343 cars per hour around the clock *(extreme values derived from theoretical values, not taking into account the distribution distribution to other modes of transport, are assumed; the example of the actual number of trucks (TIRs) handled by DCT in 2017 was 300,000)*.

Based on the number of cars given above, the equivalent acoustic power of point sources representing vehicle traffic operations was calculated. The basic data for calculating the power level of substitute noise sources were adopted on the basis of "Materiały XXVII Zimowej Szkoły Zwalczania Zagrożeń Wibroakustycznych", Gliwice-Ustroń, 22.02-27.02.1999 (Materials of the XXVII Winter School for Combating Vibroacoustic Hazards - paper by Ryszard Hnatków from the Institute of Physics at the Silesian University of Technology in Gliwice - Sound power level of moving noise sources moving at a constant speed).

This paper gives the average value of sound power level for trucks based on the test results of different types of cars: L_{AW} = 96.5 dB.

Based on the above data and the estimated vehicle travel time through the Terminal Area, the equivalent sound power level of one alternate vehicle noise source was calculated - daytime and night time L_{AW} = 112.6 dB.

To better represent vehicular traffic through the Terminal area, this source was divided into 28 sub-sources. The sound power level of one partial source is - daytime and night time L_{AWi} = 98.2 dB each.

8.5.6 Calculation results

The basis for the nuisance assessment and calculations is the Polish Standard PN-ISO 9613-2 - Acoustics. Sound attenuation during propagation in the open space. General calculation method with SoundPlan 7.4 computer program.

Computer simulation of acoustic situation for the Container Terminal was conducted jointly for daytime and night time in one option according to the assumptions described above.

As mentioned above, calculations were performed for the most unfavourable situation in terms of acoustics, assuming simultaneous operation of all inventoried noise sources.

The results of calculations at the observation points are presented in the attached table in the form of values of equivalent noise level, while the general acoustic situation is presented in the form of acoustic map.

An image of the sound field common to daytime and night time is shown in the figure below and in A3 in **Appendix 8.5-1**.

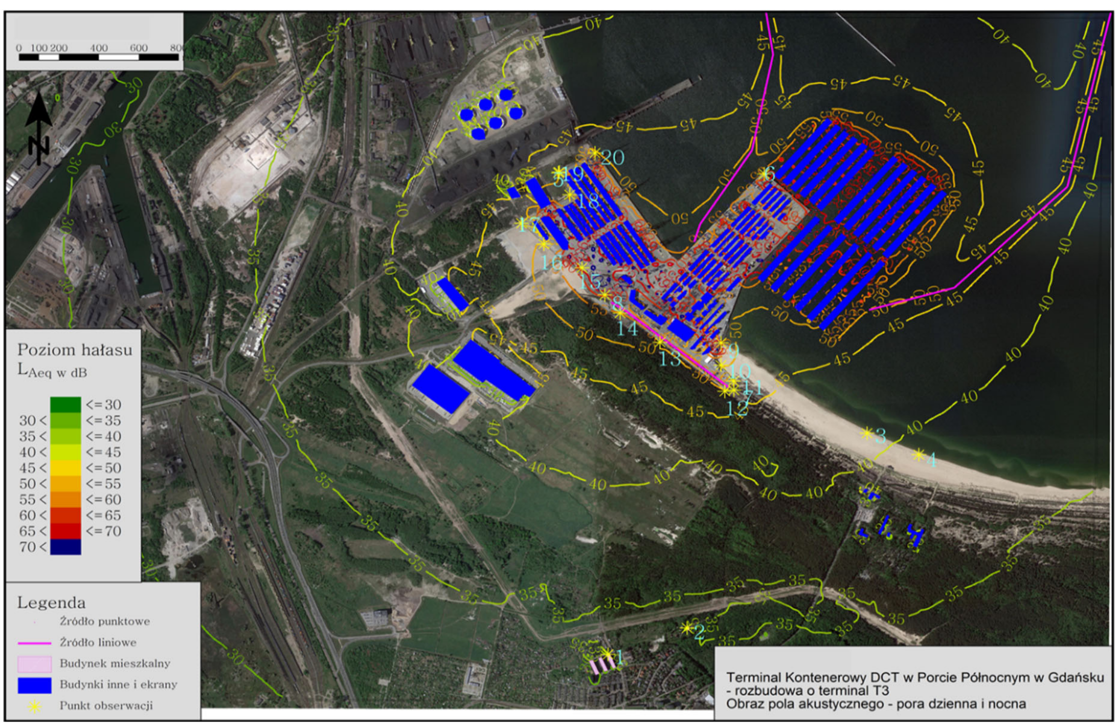

Figure 105 Acoustic field image common for daytime and night time

Observation points were located at the façades of residential buildings in Stogi district and at points corresponding to measurement points of acoustic measurements taken on the boundary of the Terminal at the height of h = 4 m and on the boundary of the area of the Container Terminal and on Stogi bathing site beach at the height of h = 1.5 m.

Table 65: Noise level at observation points

Noise level at observation points		
Point No.	**Height above ground level [m]**	**Daytime and night time L_{Aeq} [dB]**
1	**4**	**36.1**
2	**4**	**36**
3	**1.5**	**40.9**
4	**1.5**	**39.1**
5	4	50
6	4	57.1
7	4	47
8	4	61
9	1.5	55.6
10	1.5	49.9
11	1.5	47.5
12	1.5	47.7
13	1.5	50.7
14	1.5	54
15	1.5	71.1
16	1.5	49.6
17	1.5	47
18	1.5	51.9
19	1.5	49.1
20	1.5	51.3

The projected noise level values are as follows:

- at the elevations of residential buildings in Stogi district - observation points no. 1 and 2
  - day and night time LAeq = 36 dB,
- on the Stogi bathing site beach - observation points no. 3 and 4
  - day and night time LAeq = 39 ÷ 41 dB,
- in acoustic measurement points - observation points no. 5 - 8
  - day and night time LAeq = 47 - 61 dB,
- on the border of the Container Terminal area - observation points 9-20
  - day and night time L_{Aeq} = 47 ÷ 71 dB,

The predicted values of noise levels at the elevations of residential buildings and at the Stogi beach are lower than the permissible levels of noise in the environment accepted for assessment both during the day and at night, while for the Stogi beach and bathing site it should be assumed that only the daytime values apply, which, however, is of no importance for the assessment of compliance with the requirements, as the night time requirements are also met.

8.5.7 Conclusion

Assessing the picture of the acoustic field caused by the operation of handling equipment and means of transport and the above presented values of the noise level at the borders of the Terminal and at the observation points located in the protected areas, it can be concluded that the Container Terminal in Gdańsk at ul. Container 7 is not onerous in terms of noise emissions to the environment.

Analysing the contributions of individual noise sources to the total level at observation point No. 1, it can be seen that the largest contribution to noise emissions comes from truck transport and containers equipped with refrigeration units.

8.5.8 Construction phase

Noise impacts during the construction phase of the proposed project are not subject to regulation due to the temporary and transient nature of these impacts. Construction of new facilities and installation of equipment will be associated with periodic noise emissions, the magnitude of which will be determined by the intensity of the work and the location of the work. Due to the nature of the project, most of the work will take place outdoors.

The specificity of the analysed project will be conducting construction works of Terminal T3 in the direct vicinity of the existing and operating Terminals T1 and T2. Construction noise would be only a portion of the noise emissions from the study area.

Noise nuisance during construction will not be harmful to the environment or people in the areas adjacent to the Terminal due to the fact that it is far away from areas that are acoustically protected around the clock, i.e. the residential development of Stogi district. It should be noted that the area acoustically protected as a recreational and leisure area is also the area of Stogi beach and bathing site.

The forecast noise level during construction and assembly works shall not exceed the value of L_A = 85 dB in the DCT area for an 8-hour noise assessment time, with an equivalent sound power level of construction equipment in accordance with applicable regulations. Periodic increases in noise emissions may occur during specific construction activities such as piling of the site.

Construction equipment must meet the requirements set out in Directive 2000/14/EC and the Regulation of the Minister of Economy of 21 December 2005 on the essential requirements for equipment used outdoors in terms of noise emission to the environment (Dz.U. No. 263, item 2202 as amended).

The permissible acoustic power level (L_{AW}) of devices intended for operation, in accordance with the Annex to the Regulation of the Minister of Economy of 15 February 2006 amending the Regulation *on the essential requirements for equipment used outdoors in terms of noise emission into the environment* (Dz. U. No. 32, item 223), may not exceed the acoustic power value L_{AW} = 105 dB.

The machinery and equipment listed below shall not exceed the following sound power values:

- dozer – loader - L_{AW} = 101 dB;
- backhoe loader - L_{AW} = 93 dB;
- soil compactor - L_{AW} = 101 dB;
- construction crane - L_{AW} = 93 dB;
- truck crane - L_{AW} = 102 dB;
- concrete mixer - L_{AW} = 100 dB;
- truck - L_{AW} = 105 dB.

The noise level emitted during the operation of the dredgers will not exceed L_A = 90 dB, and due to the significant remoteness of the acoustically protected areas from the reservoir, which will be subject to dredging, excessive noise emission is not expected to enter the residential areas of the multi-family district of Stogi. Consideration should be given to noise emissions to the beach and bathing site. It may be a good idea to conduct dredging of the basin adjacent to Terminal T 3 outside the summer season in the spring, fall, and winter.

In addition to noise impacts, vibration may occur during construction of Terminal T 3. They can only accompany certain hydraulic engineering works such as quay construction. Vibrations due to the long distance from residential areas will not be felt by these buildings.

8.6 Impact on nature and protected areas

8.6.1 Invertebrates/macrozoobenthos

Construction stage

Implementation of the project will result in the destruction of existing seabed habitat on a total area of approximately 133 ha, with the area of the new T3 terminal planned to be flooded - approximately 95 ha, to be considered a permanent loss of habitat associated with sandy and silty coastal seabed. The analysed fragment of the seabed of the Gulf of Gdańsk in the area of the planned investment is characterized (cf. Chapter 6):

- moderate and low levels of biodiversity,
- average biomass - not out of line with other similar ecological systems within the Bay,
- lack of presence of protected species and habitats.

Opportunistic species with a wide range of tolerance to varying or changing environmental conditions were found among the dominant organisms in terms of abundance and biomass.

Therefore, it should be concluded that permanent destruction of a fragment of the gulf bottom on an area of approx. 95 ha (the planned terminal) and conversion of an area of approx. 38 ha, in the context of moderate biocenotic values, will be a minor impact, given the wide distribution of analogous habitats in the entire Gulf of Gdańsk.

Operation stage

During the operational phase, partial restoration of seabed habitats located within the dredging works (an area of approximately 38 ha) may occur.

Based on the analysis of macrobentofaunal sample results, it can be concluded that the taxonomic composition is dominated by species resistant to environmental stress. Most of them are mobile, so they should recolonize the bottom area at a rapid pace (a few months) once the dredging is completed. Reconstruction of the malacofauna will take place over a longer period of time (2-3 years).

It should be expected that in the dredged area, due to altered physical conditions (increased depth, illumination, and thus water temperature and salinity), different seabed biocenosis systems will be formed compared to current forms. This will not be significant to the sustainability of the seafloor ecosystem.

8.6.2 Ichthyofauna

Construction stage

The project will result in the transformation and destruction of existing seabed habitats on a total area of ca. 133 ha, and as described above, the area of the new terminal DCT3 - ca. 95 ha will be permanently and irreversibly destroyed and transformed into land area. There will therefore be a permanent, irreversible loss of habitat associated with sandy silty coastal seabed in the area. At the same time, during the period of work, there will be periodic overfishing of fish due to noise and vibration emissions, as well as an increase in suspended solids in the water, which will translate into short-term changes in light conditions.

In the area of the planned project it was found (cf. Chapter 6):

- the presence of at least 18 species of fish,
- presence of at least 2 species subject to legal protection - twait shad, shortnose sturgeon
- share of 4 species of industrial importance - cod, flounder, herring and sprat,
- the generally moderate nature of the biocenotic diversity of the habitat, as determined by macrozoobenthic composition.

Construction of the T 3 terminal and harbour basin dredging activities could disrupt herring and sprat migration within the harbour area and adversely affect spawning. Bottom dredging will cause water turbidity and deterioration of physical and chemical conditions, including oxygen conditions, which may act as a barrier to fish movement. Also, the increased noise and vibration resulting from equipment operation and barge traffic will result in fish deterrence. Concentration of works may cause short-term isolation of the western eastern part of the area. This could disrupt fish spawning migrations and the dispersal of juvenile fish to habitats located in the rest of the basin. This impact can be mitigated by the method of dredging i.e. no dredging during April-June-VI, taking measures to limit the spread of suspended solids (runoff from dump barges).

It is assessed that permanent destruction of a part of the bay bottom in an area of approximately 95 ha (planned terminal) and conversion of an area of approximately 38 ha (dredging area) as well as the short-term impacts described above will not result in a significant impact on ichthyofauna in the Gulf of Gdańsk. These impacts will be local in nature and will not affect fish habitat in a broader spatial context. This will not be significant to the sustainability of populations of ichthyofauna species recorded in the area, including protected and useful species.

Operation stage

During the exploitation phase, the seabed habitats located within the dredging works (an area of about 38 ha) may be partially restored and therefore they will be reused and inhabited by ichthyofauna.

The overall restoration of the seabed biocoenosis will take about 2-3 years, hence it can be assumed that the area will also be recolonized by fish during this time, although undoubtedly many of them will use the dredged area immediately after the works are completed.

It should be expected that in the dredged area, due to altered physical conditions (increased depth, illumination, and thus water temperature and salinity), different seabed biocenosis systems will be formed compared to the current ones, and consequently different fish species may appear here. There will be no impact on the sustainability of populations of ichthyofauna species recorded in the area, including protected and useful species.

8.6.3 Birds

Construction stage

The following negative impacts on avifauna will occur during the construction phase, which can be mainly identified with the following factors:

- disturbance of birds in the area and surroundings of the project as a result of construction works and the need to move to adjacent areas;
- physical elimination of the availability of foraging habitat and resting places in the coastal part of the marine basin - associated with the flooding of part of the basin and the construction of the T3 terminal.

The displacement of birds due to noise and vibration emissions, vehicle and vessel traffic will be a short-term and transient impact, which in practice will be limited to the project area (total area of about 133 ha).

It should be noted that the area of the planned project is a section of a marine body of water. In terms of avifauna, the area is characterized:

- lack of breeding sites for birds - the closest sites are located on piers and land areas - a considerable distance from the planned works,
- use of the basin mainly by migrating and wintering birds - but as the results of the study show, this part of the basin is not of key importance in terms of numbers and species diversity of birds during migration and wintering.

Therefore, it should be concluded that the planned investment at the construction stage will not have a significant negative impact on breeding avifauna as well as migrating and wintering birds within the Gulf of Gdańsk, including in particular birds protected within the Natura 2000 Zatoka Pucka area. They are characterized by high mobility and plasticity in their use of sites that provide optimal resting and foraging conditions.

As a result of the construction works, the area of the new terminal T 3 - about 95 ha - will be permanently and irreversibly destroyed and transformed into land. Thus, there will be a permanent, irreversible loss of habitat in the area associated with a coastal marine body of water used by birds during migration and wintering. As noted above, this area is not critical for birds during this period, yet birds show considerable mobility in selecting resting and foraging sites. The coastal waters surrounding the proposed project offer a significant area of suitable conditions, as demonstrated, among other things, by the results of bird counts presented in Chapter 6.

Operation stage

During the operations phase, two major factors are expected to cause adverse effects on birds:

- overfishing of migrating and wintering birds stopping over the area of the planned terminal (vessel traffic);
- disturbing and frightening nesting birds on the harbour piers - including the ore pier.

Potential negative impacts (in the form of temporary disturbance of birds) may affect the fraction of birds using the harbour basins for resting during the breeding and wintering period, although as shown in the studies, the investment area is not among the harbour basins occupied by birds in large numbers. Species impacted include: tufted warblers, conditionally common shrike (not found in large numbers in recent years), great crested grebe, common merganser and cormorant. Other wetland species did not form large groupings in Port Północny work area. However, the projected minor adverse impact would be on a very small area of water adjacent to the harbour. This will necessitate the movement of birds out of the terminal basin. Given their mobility and the availability of suitable water bodies in the vicinity, there will be no significant negative impact.

In the case of potential impact on breeding birds it should be stated that the identified breeding sites (including birds protected within Natura 2000 Zatoka Pucka) are located outside the area of the planned investment. It is not anticipated that they will be impacted. In the case of gulls, the birds are nesting at a safe distance from the planned works and the future terminal site. Generally, on the basis of previous observations of birds breeding in the area of Port Północny, it has been noted that they have a very high tolerance for anthropogenic impacts associated with the movement of vessels, construction and reloading works on quays and piers.

Therefore, the potential for adverse impacts during the operational phase on both breeding birds and birds using coastal marine areas for migration and wintering is not anticipated.

As mentioned in Chapter 6, the South Baltic migration corridor passes over the project area, through which tens of millions of birds pass each year during their spring and autumn migration. During the last 10 years, when bird monitoring work has been carried out in the area of functioning port infrastructure elements, no cases of any impact on migrating birds have been recorded. Despite the location of high elements (cranes, overhead cranes) in the area, no cases of increased intensity of bird collisions with elements of the port infrastructure were found. An analogous lack of impact should also be expected for the described project.

8.6.4 Marine teriofauna

Among the valuable species of marine mammals that may occur in the area of the planned project and its surroundings, the grey seal should be mentioned first of all.

Construction stage

Potential disruptions to the natural behaviour of marine mammals may be associated with noise emissions during project construction. Potential impacts will be local and short-term, limited to the area and duration of construction (terminal site flooding) and dredging activities. Once the work has ceased, and the noise disturbance has subsided, the situation will return to what it was before the work began. Another potential impact on Natura 2000 conservation objectives, i.e. marine mammals, is potential water pollution due to ship or machinery failure. However, given existing emergency procedures for vessels and shore-based services organizing and participating in spill response, increased mortality of marine mammals as a result of accidents is unlikely. Hence, this factor is considered insignificant and negligible.

Due to the distance of the conducted works from places used by seals as well as other marine mammals, taking also into account the relatively small area of the executed works, the probability of negative impacts on marine mammals, including the population of grey seal *Halichoerus grypus* and harbour porpoise *Phocoena phocoena* is minimal. It can be assumed that due to the skittishness of these animals (and in the case of porpoise, the low probability of swimming), they are likely to avoid areas where work will take place. Hence, these impacts will be insignificant.

Operation stage

Due to the location outside seal concentration areas (the main area - the Vistula mouth - "Mewia Łacha" reserve) no negative impact of the planned project on the grey seal and other marine mammals occurring in the Gulf of Gdańsk is expected.

8.6.5 Impact on ecological corridors and migration routes

The area of the planned investment is located in the marine area - peripherally to the migration corridors of large mammals determined on the basis of research and analyses of the Mammal Research Institute of the Polish Academy of Sciences in Białowieża (Jędrzejewski et al., 2005). It also does not cross or interfere with migration corridors mapped within ECONET (Liro 1995), or other published concepts (Kiczyńska, Weigle 2003). It is also located outside of the terrestrial ecological corridors designated in the current Pomorskie Voivodeship 2030 Spatial Development Plan.

However, the project area is known as a bird migration route along the Baltic Sea coast (Gromadzki, Sidło 2000, Gromadzki et al., 2002). In the ecophysiographic study for the spatial development plan of Pomorskie Voivodeship (Czochański, Lemańczyk, 2007) and in the Spatial Development Plan of Pomorskie Voivodeship (2009), the area covered by the present study is located within a corridor of national importance: the Pomeranian-South Baltic migration corridor. It covers the coastal area of the southern Baltic Sea, which is the European waterfowl migratory route between north-eastern Europe and the wintering areas located in western Europe.

Movements of water and wetland birds in the Gulf of Gdańsk are very frequent. This is evidenced by both ringing results and direct observations (Busse and Gromadzki 1962, Brewka et al. 1987, KULING Waterbird Research Group's Database of Ringed Birds). The coastal belt is an important corridor for long-distance migration (e.g., for geese, cranes) as well as local and regional movements.

In the case of regional and local movements, the flocks of cormorants congregating in Port Północny are probably partly birds breeding in the Kąty Rybackie Reserve. In the case of wintering ducks and gulls, movements between the area of Port Północny and adjacent water bodies located in or near the Ptasi Raj and Mewia Łacha reserves were observed. Waterbird movements between Port Północny and the reserves are also highly likely: Kępa Redłowska, Mechelińskie Łąki and Beka, as well as Natura 2000 areas - Puck Bay, Vistula Estuary, Vistula Lagoon and Lower Vistula Valley. Such movements prove the existence of functional connection of protected areas located in the area of the Gulf of Gdańsk. Waterbirds move between these areas depending on local conditions (weather, habitat food abundance).

At the stage of operation of the T3 terminal and the Terminal as a whole, the indirect impact of the project (ship traffic) will result in displacement of waterfowl during the wintering period and to some extent in changes of their spatial distribution. However, vessel traffic will not affect the migration of migratory and wintering birds in any way, either locally or regionally. In the supra-local context of the Puck Bay, or Gdańsk Bay more broadly, no changes in bird numbers during migration stops and wintering are expected.

The impact of the planned project both at the stage of construction and operation on the seasonal migration routes of birds is likely to be negligible or unnoticeable. Larger bird species (e.g., geese, cranes) traveling at higher altitudes will not change flight directions as they do over urban areas. Smaller low-level migratory species will fly over the terminal, as they currently do over other parts of the port, or will modify their route slightly by avoiding the terminal and maintaining overflight of undeveloped areas.

8.6.6 Habitats and vegetation of the terrestrial hinterland

Due to the location of the proposed project entirely within a water body, no direct impacts to shoreline habitats and plant communities are anticipated. Therefore, there would be no adverse impacts to natural habitats located in the project's terrestrial backcountry:

- 1210 - wreck line on the seashore,
- 2120 - coastal white dunes,
- 2130 - coastal gray dunes.

At the stage of the project's functioning, an indirect effect connected with additional shore protection by the new, expanded terminal will be:

- reduction of the wave force,
- increased accumulation of beach sediments, including organic material - wreck line,
- development of wreck line communities.

Changes associated with shoreline growth and increased wreck line accumulation on the east side of the existing T 1 terminal are already being observed and were noted, among other things, in reports on the effectiveness of mitigation measures taken in connection with the construction of the T 2 terminal.

These phenomena are judged to be positive for the development of the Nakika communities, representing habitat 1210 - wreck line on the seashore. Expect to see an increase in plants characteristic of these habitats including coastal watercress and sea rocket, as well as the possible appearance of other species.

8.6.7 Impact on protected areas

From the point of view of a comprehensive assessment of the planned investment's impact on the natural environment, an adequate analysis of the possible impact on protected areas, including in particular Natura 2000 areas (due to the direct vicinity of the Natura 2000 PLB 220005 "Zatoka Pucka" area), is very important.

According to Article 33. of the Law on Nature Conservation: "it is forbidden to undertake activities that may, separately or in combination with other activities, significantly adversely affect the conservation objectives of the Natura 2000 area, including in particular:

1) deteriorate the condition of natural habitats or the habitats of plant and animal species for whose protection the Natura 2000 area was designated, or
2) have a negative impact on species for the protection of which the Natura 2000 area was designated, or
3) deteriorate the integrity of the Natura 2000 site or its links with other sites.

Derogations from the above-mentioned prohibitions are provided for in Article 34 of the Act and cover only projects that meet the following derogation conditions:

- requirements of overriding public interest, including those of a social or economic nature,
- lack of alternative solutions,
- providing the necessary natural compensation.

8.6.7.1Assessment of the impact on NATURA 2000

The Special Protection Area of Natura 2000 PLB220005 "Zatoka Pucka" (Puck Bay) is located directly in the area intended for the investment.

In addition, in the vicinity of the planned investment there is another SPA Natura 2000 area of Special Protection of Birds Natura 2000 PLB220004 Ujście Wisły - located approximately 5.5 km from the investment. The subject of protection within the borders of both refuges are birds and their habitats.

Natura 2000 SACs are also located in the vicinity of the project area:

- PLH220044 "Ostoja w Ujściu Wisły" - located 2.4 km to the south-east of the planned investment
- PLH220030 "Wisłoujście Fortress" - located 2.5 km south-west of the investment...

Within their boundaries, natural habitats and habitats of some fauna (except birds) and flora species are protected. The location of Natura 2000 sites in relation to the planned project is presented in the figure included in Chapter 6.

Due to its remote location, the execution and functioning of the planned project, both at the stage of construction and operation, will not have any direct or indirect impact on the condition of the natural habitats protected within the Natura 2000 SACs mentioned above.

No sites of fauna or flora species protected within the boundaries of SCIs have been found in the area of the planned investment, including sites of bats protected within the "Wisłoujście Fortress" refuge.

Therefore, it should be concluded that the planned project will not cause a negative impact on natural habitats and habitats of species protected in the areas of Community importance located in the vicinity - PLH220030 "Twierdza Wisłoujście" and PLH220044 "Ostoja w Ujściu Wisły".

The occurrence of bird species protected within the SPA PLB220005 "Zatoka Pucka" was found in the project area and its surroundings. In the context of the Natura 2000 impact assessment and meeting the prerequisites of Article 33 of the Nature Conservation Act, the analysis of the impact on protected birds within the SPA is therefore crucial. Moreover, the following subsections assess the possible impact on other (apart from birds) fauna species protected within the Natura 2000 areas located in the vicinity of the planned investment (marine mammals, fish).

The Natura 2000 impact assessment refers to the so-called "favourable conservation status" of these habitats and species, which is defined as follows:

favourable conservation status of a species - a status in which data on the population dynamics of that species indicate that the species is a persistent component of its suitable habitat, the natural range of the species is not declining or will not decline in the foreseeable future, and sufficient habitat for the persistence of the species' population exists and is likely to continue to exist;

favourable conservation status of a natural habitat (ecosystem) - the state in which the natural range of a natural habitat and the areas occupied by that habitat within its range do not change or increase; the structure and functions which are necessary for the long-term maintenance of the habitat exist and are likely to continue to exist; and the species typical of that habitat are in favourable conservation status.

Due to the spatial extent of the project, both at the execution and operational stages, the impact on areas (habitats and species) located at a distance of more than 3 km from the project boundaries is not expected.

8.6.7.1.1 Impact on bird species being the object of protection of the *Natura 2000 area "Zatoka Pucka"*

The following negative impacts on avifauna will occur during the construction phase, which may affect species that are protected in the Natura 2000 area:

- eliminating the availability of foraging habitat and resting areas in the nearshore portion of the marine basin;
- possibility of disturbing birds in the area of investment as a result of construction works.

In the exploitation phase, two basic factors may be expected to have a negative impact on the species that are the subject of protection in the "Zatoka Pucka" SPA:

- the disturbance of migratory and wintering birds stopping over in the area of the planned terminal;
- disturbing and frightening nesting birds on the harbour piers - including the ore pier.

The current SDF (updated - February 2017) describing the site's conservation objectives, includes 32 conservation targets from 22 species and a grouping of wetland birds taken together (concentrations above 20,000 individuals). Species migrating, wintering as well as breeding in the area (Table 66).

Table 66 Current objects of conservation of the PLB220005 Puck Bay area - an excerpt from SDF

Code	Species name	Type	Population in a refuge			Area assessment			
			Size		Unit	A/B/C/D		A/B/C	
			min	max		Population	State of preservation	Insulation	General assessment
A005	Podiceps cristatus	c	700	1200	i	C	C	C	C
A005	Podiceps cristatus	in	1200	4500	i	C	C	C	C
A028	Ardea cinerea	r	204	204	p	B	B	C	B
A036	Cygnus olor	in	2500	13350	i	C	C	C	C
A038	Cygnus cygnus	c	116	400	i	C	B	C	C
A038	Cygnus cygnus	in	120	700	i	C	B	C	C
A048	Tadorna tadorna	c		115	I	A	A	A	A
A061	Aythya fuligula	c	10000	30000	i	B	C	C	C
A061	Aythya fuligula	in	3000	40000	i	B	C	C	C
A062	Aythya marila	in	100	7000	i	C	B	C	C
A062	Aythya marila	c	500	12500	h	C	B	C	C
A066	Melanitta fusca	c	500	3500	i	C	C	C	C
A066	Melanitta fusca	in			i	C	C	C	C
A067	Bucephala clangula	c	2000	7000	i	C	C	C	C
A067	Bucephala clangula	in	2000	7000	i	C	C	C	C
A068	Mergus albellus	in	550	1550	i	C	B	C	C
A069	Mergus serrator	c	300	700	i	B	C	A	B
A069	Mergus serrator	r			i	B	C	A	B
A070	Mergus merganser	r	8	14	p	C	B	C	C
A070	Mergus merganser	in	400	17000	i	C	B	C	C
A125	Fulica atra	c	6500	33500	i	C	C	C	C
A125	Fulica atra	in	4000	9000	i	C	C	C	C
A137	Charadrius hiaticula	r	4	10	i	C	B	C	C
A149	Calidris alpina	c	2500	2500	i	B	B	A	B
A160	Numenius arquata	c	150	150	i	C	C	C	C
A184	Larus argentatus	r	87	90	p	B	A	C	B
A191	Sterna sandvicensis	r		140	p	A	A	B	A
A193	Sterna hirundo	r	6	68	p	C	C	C	C
A195	Sternula albifrons	r		35	p	B	B	C	B
A391	Phalacrocorax carbo sinensis	c	6500	12500	i	c	c	c	c
A391	Phalacrocorax carbo sinensis	in	5000	10000	i	c	c	c	c
A608	Motacilla citreola	r	7	9	p	B	C	A	B

Type: p = sedentary, r = producing offspring, c = migratory, w = wintering
Unit: i = individuals, p = pairs

During inventory work performed for the Maritime Authority (Orbital 2016), 24 bird species were recorded in the area of direct impact, 8 of which were recorded on the beach adjacent to the area. Long-tailed duck, great crested grebe, and herring gull complex were most abundant in the area, accounting for over 78% of all wetland birds recorded during the survey. Of the 24 species - nine are listed in the applicable SDF for the site as conservation targets.

Table 67 Bird species in the area of direct impact of the investment

Species recorded during inventory work done for the Maritime Authority (own compilation after Orbital 2016 - separated area VIIIa). Species of conservation concern in the Zatoka Pucka Natura 2000 site are highlighted in bold.

	Species	Total birds found at all checks	Maximum abundance recorded during surveys	Frequency (% of inspections with species recorded)
1	Long-tale duck / Clangula hyemalis	2597	840	42
2	**Great Crested Grebe / Podiceps cristatus**	**1813**	**321**	**61**
3	European herring gull	819	90	58
4	Black-headed gull / Chroicocephalus ridibundus	471	186	42
5	Grey Gull / Larus canus	232	60	25
6	**velvet scoter / Melanitta fusca**	**172**	**124**	**8**
7	**Common merganser / Mergus merganser**	**151**	**42**	**33**
8	Goldeneye / Bucephala clangula	137	49	31
9	**Mute Swan / Cygnus olor**	**107**	**31**	**39**
10	**Cormorant / Phalacrocorax carbo**	**89**	**49**	**19**
11	Mallard / Anas platyrhynchos	26	16	8
12	Herring gull / Larus marinus	16	7	8
13	Black-necked grebe / Podiceps nigricolis	13	4	11
14	Grey Heron / Ardea cinerea	12	4	14
15	**Smew / Mergus albellus**	**10**	**10**	**3**
16	Red-knot / Calidris canutus	9	9	3
17	**Dunlin / Calidris alpina**	**8**	**8**	**3**
18	Horned grebe / Podiceps auritus	7	4	6
19	Common ringed plover / Charadrius hiaticula	7	3	11
20	Ruddy turnstone / Arenaria interpres	3	3	3
21	Eurasian curlew / Numenius pheaopus	3	3	3
22	**Eurasian curlew / Numenius arquata**	**3**	**3**	**3**
23	**Whooper swan / Cygnus cygnus**	**3**	**3**	**3**
24	Redshank / Tringa totanus	2	2	3

Great Crested Grebe (A005)

Puck Bay is one of the most important refuges in the country for migrating and wintering individuals of great crested grebe - A grade. Although the numbers found in this area in autumn and winter constitute less than 1% of the biogeographic population (according to Wilk et al. 2010), the largest known flocks in the national population are observed here (Tomiałojć and Stawarczyk 2003). It is not uncommon for them to reach numbers of several hundred individuals, and considering the whole, the grouping may even reach about 4500 individuals - as in October 2007. Usually during migration 700-1200 individuals were found, whereas the wintering population in the refuge area ranged from 400 to maximum 1200 individuals (2007/2008). Most often Great Crested Grebes congregate near Port Północny, along Kępa Oksywska, or near the mouths of the Płutnica and Reda rivers. During the inventory work in the area of direct impact and adjacent to the project (Orbital, 2016), concentrations of more than 150 individuals of the species were found several times during the migration and wintering period. Species occurrence was confirmed at over 60% of the controls with a maximum recorded count of 321 birds during the spring migration period. The recorded grouping represents 7% of the highest abundance of the species in the area. It is forecasted that the possible works will cause temporary displacement of birds outside the project area during the period of conducting the works (construction phase), which will not negatively affect the situation of the species in the area. <u>No significant impact is anticipated during the operational phase</u>.

Cormorant black (A017)

The species does not nest in the refuge. Autumn cormorant abundance has been on an upward trend since the 1990s. The largest flock estimated at approximately 11,000 individuals was observed in October 2007 at Ryfa Mew (Gull Reef), but due to problems with undercounting cormorants sitting in large groups, the abundance may have been higher (Meissner et al. 2009). Autumn cormorant concentrations on the Puck Bay are estimated at 21,000 individuals, or 14% of the national population during this period (grade B). Cormorants found in the area in winter constitute a significant part of the national non-breeding population (Bzoma 2011) - from several dozen to even 50% of wintering birds in Poland. These numbers represent over 2% of the biogeographic population (Wolf et al. 2010). The birds feed on the whole Puck Bay, staying overnight in the harbour areas (Hel, Gdynia, Port Północny in Gdańsk and on the Gull Barrier) and along the cliffs in Puck and Swarzewo. Up to 8,000 resting and nighing birds have been reported on the breakwaters during the winter (Orbital 2016). Found in the immediate impact area of the project seven times (out of 36 inspections during the study cycle). A maximum of 49 individuals were recorded (a total of 89 birds were found). <u>The project will not affect either the functioning of the roosting site located outside the impact area or any potential bird feeding sites, which as shown in the inventory material (Orbital 2016) are marginal and insignificant for the species.</u>

Grey Heron (A028)

One breeding colony in the refuge area is located in the alder forest near Mosty village (Kosakowo commune). In 2006, it counted 363 pairs, while in 2011. - 240 pairs , representing over 2% of the national population (after Wolf et al. 2010). Probably due to the presence of the colony in Mosty and a relatively large colony in Kąty Rybackie (outside the area), the greatest numbers of grey herons are recorded in the refuge area during the summer and autumn seasons. The number of overwintering individuals depends on the severity of the winter (Tomiałojć and Stawarczyk 2003). Occasionally, groupings of grey heron along the shores of Puck Bay reach significant numbers during winter (up to 200 birds encountered) compared to the situation in Poland and constitute about 10% of the national population (Tomiałojć and Stawarczyk 2003). The breeding colony is located a considerable distance of 30 km from the project site. <u>Individuals or groups of up to 4 birds were observed (Orbital, 2016) resting on the beach (on the east side of the T1 terminal) in the area. No impact on the species.</u>

Mute Swan (A036)

The wintering population amounts to 3.9% of the biogeographic population (Wilk et al. 2010) and several dozen percent of the wintering population in Poland (Tomiałojć and Stawarczyk 2003). The birds winter in the entire Puck Bay, but the largest concentrations are seen along Hel Peninsula, e.g. in 2006 there were 4030 individuals between Kuźnica and Jastarnia. A similar sized flock (over 5,000 mute swans) was in the same area in February 2005 (Meissner & Rydzkowski 2006). The record-breaking year was 2009, when in February nearly 13,500 individuals were observed throughout the refuge - the largest grouping of this species ever recorded in Poland (Tomiałojć & Stawarczyk 2003, Wieloch 2004). This represents about 5% of the wintering population in northwestern and central Europe estimated at 250,000. Individuals (Wetlands International 2006). Increasing synatropism during wintering is characteristic of this species, as during some winters there are up to 500 individuals in total on the urban beaches of Tri-City alone. Overwintering mute swans, during snowless winters, often forage in agricultural fields located around Puck Bay but outside the refuge boundaries. Up to 160 individuals were found in the port area, with only a small grouping on the east side of terminal T 1 in selected months with a maximum of 31 individuals. Taking into account the maximum number of the species in the Natura 2000 area, which exceeds 13,000 individuals, it is expected that the possible works will cause temporary displacement of the birds outside the investment area during the investment works (construction phase), which will not negatively affect the situation of the species in the area. <u>No adverse impacts are also anticipated during the operational phase</u>.

Whooper swan (A038)

Puck Bay is a key location for wintering Whooper Swans in Poland. The numbers found in autumn and winter constitute over 1% of the biogeographic population (Wilk et al. 2010) and over 15% of the wintering national population (Tomiałojć and Stawarczyk 2003). The largest number of individuals is usually found in the inner part of Puck Bay. In November 2011, 715 individuals were recorded, of which 398 were between Osłonin and Puck, and 182 along the Hel Peninsula between Kuźnica and Jastarnia (Meissner et al. 2013). Very high numbers of Whooper Swan were also observed in winter 2009 (approx. 670 individuals in January and February - Meissner and Rydzkowski 2010). Like the mute swan, this species readily uses foraging grounds in fields (outside the refuge area) during snowless winters. In spring it is much less numerous in the Puck Bay area.

In the area of the planned work, the species was found on one control and three individuals (Orbital 2016) . <u>No impact of the project on the species</u>.

Common shelduck (A048)

For breeding common shelducks, the Puck Bay is a nationally important refuge. It is estimated that 16-25 pairs breed, which may represent more than 15% of the national population of about 120-150 pairs (Wolf et al. 2010). Due to the biology of the species, finding and roughly estimating the number of nests is extremely difficult. It is likely that many pairs nest outside the refuge boundaries, and only after the young hatch do families swim within the area. Annually, up to several families of common shelducks are observed near the mouth of the Reda River, with the birds exhibiting breeding behaviour practically in the entire refuge area, not excluding harbour areas heavily transformed by man. The flocks encountered during both spring and autumn migration are among the largest in Poland (Tomiałojć and Stawarczyk 2003). Flocks of usually a few dozen birds, are most common in spring. Occasionally they may exceed a total of 100 individuals throughout the refuge, as in May 2007 (Meissner et al. 2009). They willingly use partially flooded meadows as feeding grounds, especially in the Beka reserve or near Władysławowo. In Port Północny area, the species has not nested for 5 years. <u>No negative impact of the project on the species in the area</u> <u>Natura 2000 area.</u>

Tufted duck (A061)

Puck Bay is very important for migrating and wintering tufted ducks. Numbers found in autumn represent over 2% of the biogeographic population (after Wolf et al. 2010). Flocks of over 20000 birds are reported from several refuges, making Puck Bay one of the most important. The largest groupings confirming this fact were recorded in January 2009 - over 29 thousand individuals (Meissner and Rydzkowski 2010). In the area of the refuge, the most common wintering sites are the mouths of the rivers Reda and Plutnica, and the area of Port Północny (Gdańsk). Grouping locations and reported abundances depend on the severity of winter and the extent of ice cover in the Bay of Puck. The permanent habitat for birds in the harbour area is the west side of the ore pier. <u>The project is not expected to result in the deterioration of the species' habitat quality during either the construction or operational phase.</u>

Greater scaup (A062)

The numbers of greater scaup found in autumn on the refuge constitute more than 2% of the biogeographical population, e.g. in October 2006 about 6000 individuals, and in winter more than 4% of the population (after Wolf et al. 2010). The largest grouping in January 2008 of about 12,500 individuals (Meissner et al. 2009), but it is difficult to indicate the size of the national population. Thousands of greater scaups are recorded only from refuges at the Baltic Sea, which suggests that the Puck Bay is also a significant part of the national population, both during migration and wintering. In the area of the refuge, greater scaups prefer to winter near the mouths of the rivers Reda and Plutnica as well as in the area of Port Północny (Gdańsk), often accompanied by tufted ducks. The permanent habitat of the few birds in the harbour area is the west side of the ore pier. <u>The project is not expected to have an impact on the deterioration of the species' habitat quality</u>.

Velvet scoter (A066)

The velvet scoter is a globally threatened species (EN according to IUCN 2012), which should result in an upgrade to A. The numbers found in autumn and winter represent about 1% of the biogeographic population (after Wilk et al. 2010) and about 10-15% of the population recorded from Polish waters (territorial waters and waters of the Polish Exclusive Economic Zone - Skov et al. 2011). Velvet scoter are abundant outside designated Natura 2000 sites (monitoringptakow.gios.pl), but areas of designated refugia may be of periodic importance to them.

The transient population in the Bay of Puck is estimated at 500-3500 individuals, however, due to the fact that larger groupings of Eurasian Dotterels inhabit a large part of the Bay of Puck, often outside the coastal zone (more than 1 km from the shoreline), this number may be underestimated. Taking into account transect counts from the ship, the transient population is estimated to be as high as 9,000 individuals. <u>There is no confirmed abundance of the species in the area of potential impact of the project</u>.

Common goldeneye (A067)

The numbers of goldeneye found in autumn (2000-7000 individuals) represent about 1% of the biogeographic population (Wilk et al.2010) and certainly exceed 2% of the national population. Similar values are recorded during the winter. During the 2011 inventory period, nearly 5700 individuals were found in the Puck Bay area during winter. Depending on the season and the extent of ice cover in the area, the largest winter aggregations are observed along the coast of Hel Peninsula, at the mouth of the Reda and Plutnica Rivers, and along Tri-City beaches. Species found very sparsely in the project area - a maximum of 49 individuals on one of the inspections). <u>No predicted adverse effects on the species</u>.

Smew (A068)

Numbers found in winter represent more than 1% of the biogeographic population (Wolf et al. 2010). Wintering birds are widely dispersed in the Puck Bay area, but the largest groupings are usually observed at the mouths of the rivers Reda and Plutnica, where flocks exceeding 600 individuals have been recorded (data from GBPW KULING). Smew may appear relatively more abundant in winter on the refuge in some seasons, such as in 2006-09 when more than 1,400 birds were recorded annually. This usually occurs during harsher winters (Meissner and Rydzkowski 2010). Single individuals were found in the project area (Orbital, 2016). No impact on the species.

Red-breasted merganser (A069)

The last probable breeding of merganser was recorded in the refuge in 2000 in Beka reserve, and now the disappearance of the population in Pomerania is considered a fact (Sikora et al. 2013) and therefore the breeding population should not currently be included in the SDF. Numbers found in fall and winter represent more than 1% of the biogeographic population (Wolf et al. 2010). The birds winter in a large part of Puck Bay waters, in the coastal zone (up to 1 km from the shoreline), in great dispersion, usually reaching total numbers of 300-700 individuals. This largest grouping of wintering mergansers on Puck Bay was recorded in February 2006. A maximum of approximately 350 individuals were recorded during spring and fall migration (November 2006). Very sparsely observed in the harbour area. <u>No impact of the project on the species</u>.

Common merganser (A070)

It is an important refuge for common mergansers, which nest in Puck Bay in the number of 8-14 pairs. As with the common shelduck, many females probably have nests outside the refuge boundaries, and only after hatching do they raise their young in waters within the refuge boundaries. Breeding mergansers were observed mostly in the southern part of the refuge, especially near the harbour area in Gdańsk. This population represents approximately 1-2% of the national population (Wolf et al. 2010).

Megansers are among the most numerous anseriformes from autumn to spring with the peak in winter (January and February) usually oscillating within a few thousand individuals. However, in some seasons, the mergansers group together at the refuge in record numbers, reaching up to 17,000 birds (2006 and 2007 seasons). The area is known to concentrate at least 1% of the migratory population and over 1% of the biogeographic population in winter (Wolf et al. 2010). The largest grouping of this species numbering about 10 thousand individuals was observed in Puck Bay between Kuźnica and Jastarnia in February 2006. Depending on the ice extent in the inner part of the bay, large concentrations were also found between Puck and Władysławowo. Similar high counts were reported in February 2007, when the number of about 21,000 common mergansers on the Bay of Gdańsk (Bay of Puck and Vistula Mouth SAC areas) was about 10% and the wintering population in central and western Europe (BirdLife International 2004).). Maximum concentrations of up to 42 individuals were recorded during the species' breeding, migration, and wintering season. No nesting has been confirmed in the impact area. The nearest breeding grounds are located in the Ptasi Raj Reserve. <u>No negative impact on the conservation area is predicted</u>.

Eurasian coot (A125)

Numbers of the species found in autumn represent, in record years, less than 2% of the biogeographic population (after Wolf et al. 2010), but average results against the national population are not high. Typically, Eurasian coot in numbers in autumn, sometimes only remaining in greater numbers for the winter. The area concentrates over 1% of the migratory population. The birds inhabit the entire Puck Bay, but the largest concentrations of coots were recorded in the inner Puck Bay and numbered over 20,000 individuals: c. 26,000 individuals in September 2004 between Rzucewo and Puck and 21,000 individuals in October 2005 between Władysławowo and Chałupy (Meissner and Rydzkowski 2006, Meissner and Rydzkowski 2007). The number of wintering Eurasian coots depends on temperatures. During mild winters, birds congregated in February 2007 and 2009 in numbers of about 7900 and about 9000 individuals, respectively. Usually these numbers oscillate around a few thousand individuals at most. A small, non-significant population resides within the harbour boundaries (Orbital, 2016). <u>No negative impact is anticipated.</u>

Common ringed plover (A137)

Based on the Pomeranian inventory of the species, the size of the breeding population of the ringed plover in the refuge area is estimated at 10 pairs (Antczak et al. 2013) , which is more than 1% of the national population as determined from Sikora et al. 2007. The birds nest in the Reda river estuary and port areas in Gdańsk, in the Vistula estuary and near Puck. <u>The project will not affect the breeding habitats of the species in the Bay of Puck Natura 2000 site. Birds regularly nest on the east side of Terminal T 1 in the area excluded from development activities for mitigation measures taken in connection with Terminal T 2.</u>

Dunlin (A149)

The migratory population reaches high concentrations of these birds in the area (up to 2,500 individuals) and high overall numbers use the bird sanctuary during migration. The shores of Puck Bay and Ryfa Mew are some of the most important foraging areas for pollinators during their autumn migration in the country. Variable duns are most abundant on the refuge during autumn migration, which lasts from July to October. Taking into account the long migration period and high exchange rate of individuals, it is estimated that the refuge is used as a feeding ground and resting place during migration by ca. 13,300 individuals or about 1% of the migratory route population (Wolf et al. 2010). Birds sparsely observed on the beach on the east side of Pier T 1. No impact on the species.

Eurasian curlew (A160)

Large Eurasian curlews migrating through Puck Bay are mainly associated with shallow pools and sandbanks in the Reda estuary area, which provide resting and feeding grounds. Up to 150 birds were found there at one time during a single inspection. This meets the criterion for a globally threatened species - IUCN 2012 NT category (Wilk et al. 2010) - rating C. In case of favourable conditions (extensive shoals, not disturbing resting birds, restoration of coastal meadows), Eurasian curlews may stop for roosting also in other places such as: Ryf Mew, Łąki Mechlińskie or Torfowe Kłyle. <u>No bird congregation sites in the vicinity of the project. During the survey work (Orbital, 2016), the species was recorded once - 3 individuals were resting on the beach on the east side of pier T1, outside the area of the planned work. The project will not result in a negative impact on the protected object in the area</u>.

European herring gull (A184)

The population of Herring Gulls nesting in the Puck Bay area is estimated at about 90 pairs. It constitutes about 7% of the national population (Wilk et al. 2010) - grade B. Additionally, an unknown, but probably much larger population of breeding birds in the Tri-City area adjacent to the refuge should be taken into account. Considering the current situation, the population of Herring Gulls on Puck Bay does not cause major conflicts with other important conservation objectives in the refuge. This is due to the fact that the European herring gulls occupy here man-made habitats - mainly ruins of buildings from the II World War period (Gdynia Babie Doły, Jurata) and harbour breakwaters in Gdynia, Gdańsk and Hel (data from GBPW KULING), which are now devoid of other breeding bird species. Sixteen pairs were found nesting in Port Północny area. All nest at a safe distance from the project area. <u>Work during both the construction and operational phases will not adversely affect the species in the area.</u>

Sandwich Tern (A191)

The protection of the breeding population of the sandwich tern in this area needs to be reviewed due to the fact that breeding was recorded in the SPA (breakwater of Gdynia harbour) only in 2006, when 140 pairs nested there (data from GBPW KULING). This represented 100% of the national population at the time. In the following seasons the colony (still the only one breeding in Poland) moved to the neighbouring Vistula Mouth

SPA. <u>No impact of the project on the species. The distance of the project from the birds' nesting site is 15 km</u>.

Common Tern (A193)

The breeding population of the common tern in the SPA Bay of Puck has undergone dynamic and favourable changes in recent years. From a few breeding pairs, it increased to 120 pairs in 2012 in Port Północny and 208 in 2013 and 79 nestlings in 2016. This is about 6% of the national population (Wolf et al. 2010). The reason is the occupation of quite safe habitats (independent from water fluctuations, as is the case on the Vistula or in the Mewia Łacha reserve) in Port Północny in Gdańsk, which positively translates into the possibility of breeding success for these birds. <u>As demonstrated by the work at T 2 (no impact), a development located at an even greater distance from the nesting platforms will not affect the breeding efficiency of the birds at the colony.</u>

Little tern (A195)

Traditional breeding habitats of the little tern, known from the 20th century, such as the beaches of Beka nature reserve or Mechelinki, have disappeaed. Currently, the species nests ephemerally, only in Port Północny in Gdańsk, where up to 35 pairs were found, which is about 4% of the national population (after Wilk et al. 2010). In 2012, 14 pairs were found there (Sikora et al. 2013), but no breeding success has been recorded since 2009 (GBPW KULING data). No nesting of the species has been confirmed in the area in recent years.

Citrine wagtail (A608)

The SPA Zatoka Pucka is an important area for breeding citrine wagtail in Poland. In the reserve "Mechelińskie Łąki" the first breeding of this species in Poland was found in 1994 (Meissner and Skakuj 1997). Currently, it nests there ephemerally (one pair was found in 2012), and the main breeding site is at the "Beka" reserve, where 7-9 breeding pairs account for over 15% of the national population. The special importance of the refuge for the citrine wagtail seems to be confirmed by the fact that in recent years additional breeding has been found in the immediate vicinity of the refuge. In 2009, 3-4 pairs were found near Górki Zachodnie and 2 pairs near Rewa. This confirms that the species is expanding its range and increasing in numbers in Pomerania (Sikora et al. 2013). <u>The project will not impair the status of the species in the refuge. There is no potential habitat preferred by the species in the vicinity of the project.</u>

<u>Anticipated impact on SPA's conservation objectives</u>

During the year-long bird surveys in Port Północny area (Orbital 2016), the most abundant birds recorded were: gulls (7 species), tufted cormorant, long-tailed duck, and great crested grebe. According to the applicable Standard Data Form (SDF) for the PLB220005 Zatoka Pucka area, the objects of protection within this area are five of the bird species listed above - scoter, cormorant, great crested grebe (wintering and passerine populations) and European herring gull (breeding population) and tufted duck. During the survey conducted (Orbital 2016), the heterogeneous occurrence of birds within the harbour was demonstrated. During the work, 6710 wetland birds were recorded in the direct impact area of the project out of 157,459 individuals found in the inventoried area (figure below). This represents only 4% of all birds recorded within Port Północny.

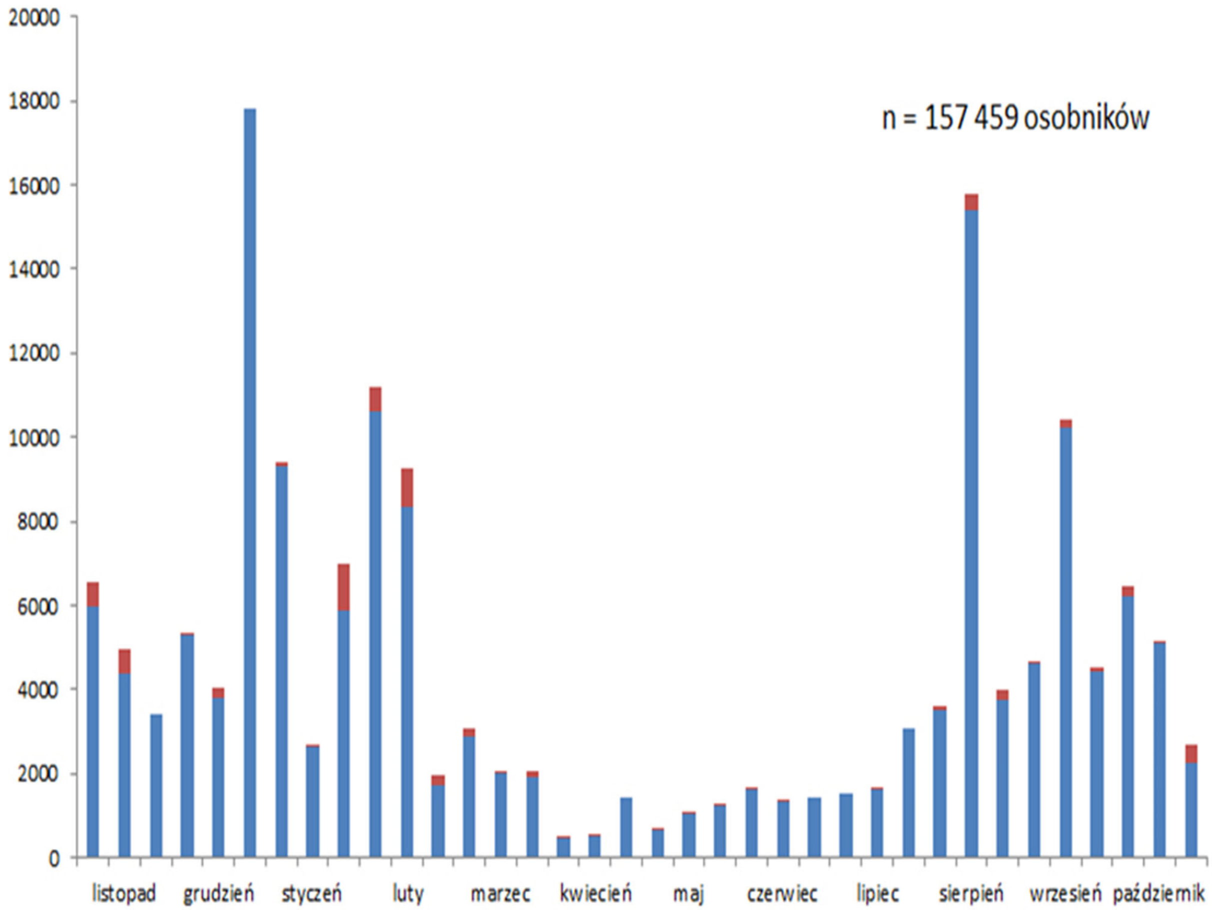

Figure 106: Annual bird occurrence within Port Północny at each inspection.
The red bar color indicates birds recorded in the area of direct impact of the project (own study after Orbital 2016).

Taking into account the small number of birds within the area of direct impact of the project on birds (see table in this chapter), as well as the low importance of the area both within Port Północny itself and the Natura 2000 area, it is not expected that the project will have a negative impact on the objects of protection.

In connection with the planned investment, a part of the area will be flooded, which is potentially a feeding ground for a number of species. However, taking into account the small size of the occupied area compared to the PLB 220005 Bay of Puck, the loss of the seabed, as well as the low usage of the area by benthic species, the impact of the project on the loss of feeding habitats should be considered insignificant.

The project will also not have a negative impact on the population of the cormorant (the most numerous species found in the immediate vicinity of the investment and being the subject of protection of the area). These birds are obligate ichthyophagous, feeding on small fish, the impact of the project on these birds will be minimal and limited to periodic disturbance from roosting sites. Impacts to the food base will be negligible, as cormorants tend to feed on pelagic fish and these will only change their habitat as a result of the works. The quality of habitat used for resting by birds will not be diminished as a result of the investment works as well as during the operational phase. There is also no predicted negative impact of the planned project on the population of the European herring gull, which is not exposed to negative impacts as it is not a bird that dives in search of food.

The dredged material obtained in the process of dredging the harbour basin will be stored on silting fields in the depth of the Gulf of Gdańsk. These areas are now regularly used to store spoil from current developments. Despite the finding of high benthic densities (Transprojekt 2015) in the deposition sites, it should be expected that due to the maintenance works (deepening of the harbour basins of Port Północny as well as the currently implemented investments related to the construction of breakwaters and the approach fairway including the steering wheel), the excavated material deposited as part of the analysed investment will not cause a direct loss of potential feeding sites due to their disappearance in connection with the procedure of other investments in the area.

Potential negative impacts on the cormorant (in the form of temporary disturbance of birds) may affect the fraction of birds using the harbour basins for resting during the breeding and wintering period, although <u>as shown in the studies, the investment area is not among the harbour basins occupied by birds in large numbers</u>. Species subject to minor short-term impacts during the development phase include: great crested grebe, mute swan, merganser and long-tailed duck. The predicted minor adverse impact will, however, affect a very small area of water at Pier T3 (dredging period) and an equally insignificant area of dredging and enlargement works and will require short-term movement of birds away from the works area. The construction portion of the development (post-flood) will not be materially different from the typical activities associated with work within the Port.

Impacts could also potentially affect nesting birds nesting in the Port (gulls, terns) through potential disturbance. However, in the case of gulls, the birds are nesting at a safe distance from the planned works (currently about 15 pairs on the island breakwater) and the future terminal site. Terns, as shown by the experience of previous years when works were carried out during the breeding season in the immediate vicinity of the colony (repair of the Ore Pier, dredging of the harbour basin) are surprisingly plastic and insensitive to such works. Conducting similar work in previous years at distances many times less than those planned for this project did not adversely affect the nesting colony (both settlement and nesting success and survival of chicks). Therefore, predicting a negative impact on tern populations in the area is not warranted.

Other bird species of conservation concern (listed in the site SDF) will clearly not be significantly affected by the project.

8.6.7.1.2 Impact on marine mammals Natura 2000 sites

The planned investment is located outside the boundaries of Natura 2000 areas whose conservation objectives include species of marine mammals. The closest regular place of residence and at the same time the place with the largest number of seals is located at a distance of 12.6 km from the borders of the project in the Vistula Mouth Reserve. Animals on a year-round cycle use periodically occurring shoals in the estuary to rest. Within a 30 km radius, there are three Natura 2000 sites where marine mammals are the subjects of protection, i.e.:

- SAC PLH220044 Reserve at the Mouth of the Vistula - distance from 2.5 to 12.6 km ;
- SAC PLH220032 Puck Bay and Hel Peninsula - distance 22.2 km;
- SAC PLH280007 Vistula Lagoon and Vistula Spit - distance 28.2 km.

Table 68. Marine mammal species of conservation concern in individual areas within 30 km of the project boundary.

SAC PLH220044 Ostoja w Ujściu Wisły (Reserve at the Mouth of the Vistula)					
Code	Species name	Area assessment			
		population	state of preservation	insulation	general
1364	grey seal / Halichoerus grypus	A	A	B	A
SAC PLH220032 Puck Bay and Hel Peninsula					
Code	Species name	Area assessment			
		population	state of preservation	insulation	general
1364	grey seal / Halichoerus grypus	A	B	B	B
1351	Porpoise / Phocoena phocoena	A	B	B	A
SAC PLH280007 Zalew Wiślany i Mierzeja Wiślana (The Vistula Lagoon and the Vistula Spit)					
Code	Species name	Area assessment			
		population	state of preservation	insulation	general
1364	grey seal / Halichoerus grypus	C	B	B	C

Population: A – 100% ≥ p >15, C – 2% ≥ p > 0%
State of preservation: A - excellent, B - good
Insulation: B - population not isolated, but occurring on the periphery of the species range
General grade: A - excellent, B - good, C - significant

<u>Impact on mammals of conservation concern of the SAC</u>

Due to the distance of the conducted works from the marine mammal sanctuaries (more than 10 km) as well as the small spatial range of the project impact, the probability of negative impacts on the coherence and integrity of Natura 2000 network and deterioration of habitats of species listed in the table above should be considered low. Potential disruptions to the natural behaviour of marine mammals may be associated with noise emissions during project construction. Potential impacts will be local and short-term, limited to the area and duration of the reefing and pier landing activities. Once the work has ceased, and the noise disturbance has subsided, the situation will return to what it was before the work began. Another potential impact on Natura 2000 conservation targets, i.e. marine mammals, is the possible emission of pollutants to water due to machinery breakdown. However, given existing emergency procedures for vessels and shore-based services organizing and participating in spill response, increased mortality of marine mammals as a result of accidents is unlikely. Hence, this factor is considered insignificant and negligible.

Summarizing the impact on the SAC protection objectives, i.e. the grey seal *Halichoerus grypus* and the harbour porpoise *Phocoena phocoena* , it can be assumed that due to the shy character of these animals (and in case of the harbour porpoise - low probability of swimming) they will probably avoid places where works will be carried out during the construction phase. So far, no regular and numerous presence of marine mammals has been recorded in the immediate vicinity of the investment area. The area does not differ from other areas under anthropogenic and industrial pressure within the Gulf of Gdańsk (data from www.hel.univ.gda.pl).

8.6.7.1.3 Impact on ichthyofauna being the object of protection of Natura 2000 areas

No species listed in Annex II of Council Directive 92/43/EEC were found in the survey catch during the inventory surveys conducted as part of the environmental impact assessment of the project in the vicinity of the Project (Transprojekt, 2015) (Orbital, 2015). However, taking into account the location of the project, this study analysed the potential possibility of occurrence of species being the objects of protection in the nearest Natura 2000 areas (Table 69). The assessment was based on literature data on species behaviourism and distribution in the area of the subject project.

Table 69 Lampreys and fish of conservation concern in Natura 2000 sites: Bay of Puck and the Hel Peninsula (PLH220032) and Refuge in the Vistula Estuary (PLH220044).

Species name	Puck Bay and Hel Peninsula	Refuge at the Vistula Estuary
river lamprey	X	X
twaite shad	X	X
atlantic salmon	X	X
bitterling		X
weatherfish	X	X
ziege		X
asp	X	X

The river lamprey (*Lampetra fluviatilis*) is the subject of protection in both Natura 2000 sites concerned. This species is found in the coastal waters of Europe from Norway to the waters lapping the Apennine Peninsula. In Poland it is distributed in the rivers of Pomerania, the lower parts of the Odra and Vistula basins. The river lamprey is an anadromous bi-environmental organism: it breeds in the upper sections of rivers. It also undergoes larval development there, from where, after metamorphosis, it floats and as an adult resides in the sea. It has a parasitic lifestyle there, sucking blood and other bodily fluids from the fish. River lampreys prefer brackish coastal waters and river estuaries. The main threats to the species were identified within its inland habitats. These included pollution of river waters and disruption of fish migration routes to spawning grounds through hydrotechnical development of watercourses.

The twait shad (*Alosa fallax*) is the subject of protection in both Natura 2000 sites concerned. The range of the twait shad includes the waters surrounding Europe and the northern part of Africa. In Poland it occurs in coastal waters along the Polish coastline. Few observations confirm its presence in the Szczecin Lagoon and the Vistula Lagoon.

Twait shad is an anadromous species that inhabits marine waters. It migrates to lower river reaches and marine lagoons to spawn. Twait shads are incidentally found in commercial fisheries conducted in Baltic waters. Natural habitats associated with estuaries (estuaries) should be considered important in protecting the species and its potential spawning areas.

Atlantic salmon (*Salmo salar*) are the subject of protection in both Natura 2000 sites concerned. Salmon are a widely distributed species within both coasts of the North Atlantic. It inhabits the ocean and seas from the coast of Portugal to the White Sea along with the northeastern areas of the Baltic Sea. Salmon are an anadromous migratory fish; they make long migrations to upper rivers to spawn, where they spend 1-4 years after hatching. After this period, having reached the smolt stage (the developmental stage of juvenile anadromous salmonids), it flows into saltwater where it spends the rest of its life until the spawning run. It thins several times during its life. ***In*** Poland, the population of this species (smolts supplying the Baltic population) is based for the most part on stocking. So far, effective salmon spawning in Polish waters has been found only in the Słupia river basin. Salmon during their life at sea, are recorded in cutter fisheries conducted in the open waters of the Baltic Sea.

The amur bitterling (*Rhodeus sericeus amarus)* is the subject of protection in the Natura 2000 area: Ostoja w Ujściu Wisły (PLH220044). ***In*** Poland it is found in almost the whole country, except for some foothills and mountainous areas. It inhabits only fresh water. It is most commonly found in small lakes, ponds and canals. It seems likely that this species occurs in the Refuge area in the Vistula Estuary (PLH220044).

The weatherfish (*Misgurnus fossilis)* is the subject of protection in both Natura 2000 sites concerned. It is found in Europe from northwestern France to the Volga River. In Poland, although not numerous, it can be found in almost the entire country; it clearly avoids mountain and foothill areas. It inhabits standing freshwater or those characterized by low flow. It occurs mainly in shallow, overgrown lakes and oxbow lakes, drainage ditches and canals.

It seems likely that this species occurs in the Refuge area in the Vistula Estuary (PLH220044).

The Ziege *(Pelecus cultratus)* is the subject of protection in the Natura 2000 area Ostoja w Ujściu Wisły (PLH220044). It inhabits free-flowing and standing waters in the catchment areas of the Baltic Sea, the Black, Azov and Caspian Seas, and Lake Aral. In Poland its occurrence is practically limited to the Vistula Lagoon, where its strong population is an object of commercial fishing. As a rheophilic species, ziege inhabits mainly estuarine regions, large dammed reservoirs, and lower sections of large and medium-sized rivers. Tolerates salinity up to 5‰.

Asp (*Leuciscus aspius*) - a species of fish from the carp family*(Cyprinidae*). It is the subject of protection in both Natura 2000 sites in question.

Its range of occurrence includes Central Europe (east of the Rhine and north of the Danube to the Urals and the Caspian Sea, also in southern Scandinavia). In Poland it is found in larger and medium-sized lowland rivers, as well as in dammed reservoirs, in flowing waters, in larger lakes and bays. In Poland the species has been recorded only a few times in the coastal zone of the Baltic Sea and in rivers flowing into the Baltic Sea. The occurrence of this species in both Natura 2000 areas seems probable.

Impact on SAC conservation targets

Due to the local, limited nature of the impact of the investment on the marine environment, there are no grounds to assume that the execution of the investment will have a significant negative impact on the conservation status of any of the species listed above.

Salmon during their life at sea, are recorded in cutter fisheries conducted in the open waters of the Baltic Sea. Therefore, the project is not expected to affect the marine life stage of this species. In the case of the Vistula basin, the main migration corridor to the spawning grounds remains the Vistula Spit, however after reviewing the description of the impact of the project on the marine environment, including the model of suspension dispersion, it was excluded that the project will have any impact on the individuals and habitat of this species, apart from the possibility of disturbance of migration due to turbidity near the mouth of the Vistula Spit.

In the case of the freshwater species bitterling, weatherfish and asp, impacts were excluded at both the investment and operation stages due to the low probability of occurrence of the species in the project area.

In the case of the ziege, taking into account the location of the project in question, its area coverage, distance from the habitats of the aforementioned species and the fact that they spawn in the upper sections of rivers with strong currents, there are no grounds to assume that the implementation of the project may adversely affect both the conservation status of the species and the status of its natural important habitats.

8.6.7.1.4 Impact on other protected animal species

During the inventory work (Orbital 2015, Orbital 2016, Transprojekt 2015), no protected species other than those listed in the section on description of environmental elements were recorded in the project impact area. In the area of the planned project, tens and sometimes exceptionally hundreds of birds feed year-round, however, it should be assumed that the predicted loss of benthic habitats as well as habitats understood as a resting place will be so insignificant in relation to all available places in the area that it should be regarded as negligible and insignificant. As mentioned earlier, the South Baltic migration corridor passes over the project area, through which tens of millions of birds pass each year during their spring and autumn migration. During the last 10 years, when bird monitoring work has been carried out in the area of functioning port infrastructure elements, no cases of any impact on migrating birds have been recorded. Despite the location of high elements (cranes, overhead cranes) in the area, no cases of increased intensity of bird collisions with elements of the port infrastructure were found. Analogical lack of impact (assuming application of twin logistic solutions at the storage yards) should also be expected in the case of the described investment.

8.6.7.1.5 Assessment of impacts on the integrity of Natura 2000 network

Both during construction and operation of the project, no impact on any of the elements of the integrity of the area, understood as the coherence of structural and functional factors determining the sustainable existence of populations, species and natural habitats for the protection of which the Natura 2000 area was designated, was diagnosed. Vessel traffic to the harbour will not pose a threat to the integrity of the area. It is estimated that in the next few years this could be up to 70 units per week (forecast for the whole DCT terminal - including currently operating berths), i.e. an average of 10 units per day moving along strictly defined (existing and functioning) access tracks.

With respect to the area of the site used by birds, there will be no significant loss, fragmentation or availability of important habitat elements for species, i.e., breeding sites, feeding sites or resting places. The project will not interrupt the patency of ecological corridors used by birds and will not permanently disturb the dynamics of migration of species being the targets of protection. Short-term intensity and interaction of some factors may adversely affect the integrity of the area for short periods of time. This applies to ecological conditions (understood as physical and chemical parameters of water), which locally and temporarily may be deteriorated, which in turn may affect feeding conditions in a relatively small part of the basin, or the need to move to other areas during the construction phase as a result of disturbance.

8.6.7.1.6 Assessment of the significance of impacts on the coherence of the Natura 2000 network

The area of investment under consideration is located within the boundaries of the SPA Natura 2000 "Zatoka Pucka" PLB 220005. This area shows functional links with two other Special Protection Areas for birds:

- “Vistula Estuary” PLB220004
- "Lower Vistula Valley" PLB040003.

Construction and operation of the project will not affect the migration links between the analysed Natura 2000 areas. Migration corridors between areas and the ability of birds to move between areas will not be disrupted. The importance of the water areas in Port Północny for migrating and wintering birds may decrease as a result of increased ship traffic (also a cumulative effect of investments in this area). However, the capacity of the Puck Bay as a wintering and resting area for birds during migration will not decrease. The complementary role of the two Natura 2000 sites mentioned above for waterfowl during migration and wintering will be maintained, while maintaining their coherence.

Both during construction and operation, there will be no permanent and significant impact on the coherence of the network, understood as the preservation of the same number and quality of species present in the area prior to the project, as well as their correct geographical distribution in relation to the range of their occurrence, including the connectivity between individual areas within the network. The function of the area and the role it plays in the Baltic coastal bird area network will not be lost. After the analysis of the influence on particular refuge objects, the influence on the level of proper conservation status of particular species being the target of protection is not diagnosed.

8.6.7.1.7 Assessment of the impact of the planned investment on the indicators of favourable conservation status for the breeding species targeted for protection in the PLB220005 area

The table below presents a synthetic assessment of the impact of the planned investment on the indicators of favourable conservation status for breeding species being the target of protection in the PLB220005 area.

Table 70 Assessment of the impact of the planned investment on the indicators of favourable conservation status for breeding species being the target of protection in the PLB220005 area

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species		Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
				Construction phase	Operation phase		
1	A005 Great Crested Grebe	up to 4500 individuals	Up to a group of birds up to 300 individuals reside within the project boundaries	Due to the increase in anthropopressure, there will be a temporary relocation of birds outside the project area	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites* during fall migration (U2)**:No scaring off or little scaring off at each key site. **Degree of anthropopressure at key sites* during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites* during spring migration (FV):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay yearly, maintained throughout the wintering period, no increase in anthropopressure during autumn and spring migration and wintering in key areas for the species, development and implementation of PoWPWP	No effect on the deterioration of the favourable conservation status of the species in the area.
2	A00 Horned grebe	up to 228 birds	Single birds were observed during migration period	No significant impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites* during fall migration (U2)**:No scaring off or little scaring off at each key site. **Degree of anthropopressure at key sites* during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites* during spring migration (FV):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay yearly, maintained throughout the wintering period, no increase in anthropopressure during	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species		Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
				Construction phase	Operation phase		
						autumn and spring migration and wintering in key areas for the species, development and implementation of PoWPWP	
3	A017 Black cormorant	up to 11,000 individuals	On the breakwaters within the harbour regularly staying overnight and resting.	No impact of the project on the species.	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites* during fall migration (U2**):No scaring off or little scaring off at each key site. **Degree of anthropopressure at key sites* during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites* during spring migration (FV):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay yearly, maintained throughout the wintering period, no increase in anthropopressure during autumn and spring migration and wintering in key areas for the species, development and implementation of PoWPWP	No effect on the deterioration of the favourable conservation status of the species in the area.
4	A028 Grey heron Breeding population	up to 365 pairs	Breeding species within 40 km of the project boundary	No impact	No impact	**Population**: Abundance stable in the last 3 years at 200 pairs **Habitat:** Presence of birds in or adjacent to a colony of live trees without nests. **Opportunities for species conservation**: Breeding success in every year, no plans to reduce population	No effect on the deterioration of the favourable conservation status of the species in the area.
5	A028 Grey heron Migrating and wintering population	up to 200 birds	Up to 4 individuals were observed resting on the beach on the east side of the T1 terminal	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Area of potential habitat during migration (U1):** Lack of reeds on at least 50% of the area of reserves: Mechelińskie Łąki, Beka, Słone Łąki and the ecological site of Torfowe. Kłyle. **Chance of species conservation (U1):** Abundance stable over the last 6 years, annually no ice cover on at least 50% of the inner Puck Bay maintained throughout the wintering period, reed cover on reserves Mechelińskie Łąki, Beka and Słone Łąki as well as ecological site Torfowe Kłyle does not increase above 50% of their area, no upward trend.	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species		Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
				Construction phase	Operation phase		
6	A036 Mute Swan	up to 13,500 individuals	Up to 30 birds were observed in the project area	Due to the increase in anthropopressure, there will be a temporary relocation of birds outside the project area	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Food Base Abundance (FV):** No downward trend in phytobenthos biomass (less than 50% decrease) from the reference value of 72.2 g.s.m·m^{-2} * and no downward trend in reed canary grass cover below 40% at key sites for the species*** **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites*** during fall migration (U1**):No scaring off or little scaring off at each key site. **Degree of anthropopressure at key sites*** during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites* during spring migration (U1):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay maintained for the whole wintering period, phytobenthos biomass not decreasing below 50% relative to the reference value of 72.2 g.s.m·m^{-2} ****, reed cover at key** sites not decreasing below 40% of their area, no upward trend, no increase of anthropopressure during autumn and spring migration and wintering at key site*** for the species.	No effect on the deterioration of the favourable conservation status of the species in the area.
7	A038 Whooper swan	up to 715 individuals	Observed once - 3 individuals during migration	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Food Base Abundance (FV):** No downward trend in phytobenthos biomass (less than 50% decrease) from the reference value of 72.2 g.s.m·m^{-2} * and no downward trend in reed canary grass cover below 40% at key sites for the species***** **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites***** during fall migration (U1**):No scaring off or little scaring off at each key site. **Degree of anthropopressure at key sites***** during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites***** during spring migration (U1):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay maintained for the whole wintering period, phytobenthos biomass not decreasing below 50% relative to the reference value of 72.2 g.s.m·m^{-2}	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species		Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
				Construction phase	Operation phase		
						*****, reed cover at key****** sites not decreasing below 40% of their area, no upward trend, no increase of anthropopressure during autumn and spring migration and wintering at key site***** for the species.	
8	A048 common shelduck Breeding population	16-25 pairs	The species has not nested within the harbour for several years	No impact	No impact	**Abundance (FV):** Abundance stable over the last 3 years at a minimum of 10 pairs. **Habitat (U1):** 5 or more families with youngsters **Opportunities for species conservation (FV):** Breeding success in each year (visible flying chicks)	No effect on the deterioration of the favourable conservation status of the species in the area.
9	A048 common shelduck Migratory population	up to 100 individuals	Not listed	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **The degree of anthropopression in the estuary of the river Reda during fall migration (U1)**: No scaring off or scaring off at each key site at low levels. **The degree of anthropopression in the estuary of the river Reda during spring migration (FV)**:No scaring or little scaring at each key site. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no or low level anthropopression during fall and spring migration in the estuary of Reda, implementation of appropriate formal and legal procedures related to development and modernization of port areas and shipping routes	No effect on the deterioration of the favourable conservation status of the species in the area.
10	A061 Tufted duck	up to 29,000 individuals	Not listed on east side of pier T1	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Food Base Abundance (FV):** No downward trend in zoobenthos biomass (less than 50% decrease) from the reference value of 70,552 g/m^2 **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during fall migration (U1-U2)**:No scaring off or little crowding at each key site. **Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during spring migration (FV):** No scaring off or scaring off at each key site at low levels.	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species: Construction phase	Impact of the project on the species: Operation phase	Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
						Chance of species conservation (U1): Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay maintained throughout the wintering period, no downward trend in zoobenthos biomass compared to the reference value, no increase in anthropopressure during autumn and spring migration and during wintering in key areas for the species, implementation of the Birds by-catch mortality reduction programme (POŚPwWP)	
11	A062 Greater scoup	up to 12,500 individuals	Species not recorded in the investment area	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Food Base Abundance (FV):** No downward trend in zoobenthos biomass (less than 50% decrease) from the reference value of 70,552 g/m^2 **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during fall migration (U1-U2)**:No scaring off or little crowding at each key site. **Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during spring migration (FV):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay maintained throughout the wintering period, no downward trend in zoobenthos biomass compared to the reference value, no increase in anthropopressure during autumn and spring migration and during wintering in key areas for the species, implementation of the Birds by-catch mortality reduction programme (POŚPwWP)	No effect on the deterioration of the favourable conservation status of the species in the area.
12	A063 Common eider	up to 2400 individuals	Not listed	No impact.	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Food Base Abundance (FV):** No downward trend in zoobenthos biomass (less than 50% decrease) from the reference value of 70,552 g/m^2 **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites (around the port of Gdańsk and the Tern) during autumn migration (U2)**:No or little scaring off at each key site. **Degree of anthropopressure at key sites (around the port of Gdańsk and the Tern) during wintering (FV):** No scaring off or scaring off at each key site at low levels.	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species: Construction phase	Impact of the project on the species: Operation phase	Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
						Degree of anthropopressure at key locations (near the port of Gdańsk and the Tern) during spring migration (FV): No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay maintained throughout the wintering period, no downward trend in zoobenthos biomass compared to the reference value, no increase in anthropopressure during autumn and spring migration and during wintering in key areas for the species, implementation of the Birds by-catch mortality reduction programme (POŚPwWP)	
13	A066 velvet scoter	up to 9,000 individuals	Observed once - 149 individuals in the area of the investment project	The work will result in the temporary displacement of birds during the course of the investment works	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Food Base Abundance (FV):** No downward trend in zoobenthos biomass (less than 50% decrease) from the reference value of 70,552 g/m^2 **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites* during fall migration (U2**):No scaring off or little scaring off at each key site. **Degree of anthropopressure at key sites* during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites* during spring migration (FV):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay maintained throughout the wintering period, no downward trend in zoobenthos biomass compared to the reference value, no increase in anthropopressure during autumn and spring migration and during wintering in key areas for the species, implementation of the Birds by-catch mortality reduction programme (POŚPwWP)	No effect on the deterioration of the favourable conservation status of the species in the area.
14	A067 Goldeneye	up to 5700 individuals	Observed several times up to 49 birds	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Food Base Abundance (FV):** No downward trend in zoobenthos biomass (less than 50% decrease) from the reference value of 70,552 g/m^2 **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure in the coastal water belt between Chałupy and Jastarnia during autumn migration (U2**):No or little scaring off at each key site. **Degree of anthropopressure in the coastal water strip between Chałupy and Jastarnia during wintering (FV):** No scaring off or scaring off at each key site at low levels.	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species		Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
				Construction phase	Operation phase		
						The degree of anthropopressure in the coastal water strip between Chałupy and Jastarnia during spring migration (U1): No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay maintained throughout the wintering period, no downward trend in zoobenthos biomass compared to the reference value, no increase in anthropopressure during autumn and spring migration and during wintering in key areas for the species, implementation of the Birds by-catch mortality reduction programme (POŚPwWP)	
15	A068 Smew	up to 1400 birds	Single birds were observed during fall migration	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, annual lack of ice cover on at least 50% of the inner Puck Bay maintained throughout the wintering period, no increase in anthropopressure during wintering in key locations (mouth of Reda and Płutnica), implementation of the programme for the reduction of bird mortality by bycatch (POŚPwP)	No effect on the deterioration of the favourable conservation status of the species in the area.
16	A069 Red-breasted merganser	up to 700 birds	The species was not recorded in the project area	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure in the coastal water belt between Chałupy and Jastarnia during autumn migration (U2**):No or little scaring off at each key site. **Degree of anthropopressure in the coastal water strip between Chałupy and Jastarnia during wintering (FV):** No scaring off or scaring off at each key site at low levels. **The degree of anthropopressure in the coastal water strip between Chałupy and Jastarnia during spring migration (U1):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay maintained throughout the wintering period, no downward trend in zoobenthos biomass compared to the reference value, no increase in anthropopressure during autumn and spring migration and during wintering in key areas for	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species: Construction phase	Impact of the project on the species: Operation phase	Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
						the species, implementation of the Birds by-catch mortality reduction programme (POŚPwWP)	
17	A 070 Merganser Breeding population	8-14 pairs	No nesting has been found within the harbour in recent years, the nearest nesting sites are within 5 km	No impact	No impact	**Population (FV):** Abundance stable in the last 3 years at 8 pairs **Habitat (FV):** 5 or more families with young, for 1 territory (leading female) there is a 2 km strip of coast with wooded banks, located in the vicinity (not more than 500 m) of a stand of 50 ha or more obligatory presence of trees at least 80 years old with the presence of black woodpecker hollows and/or rotten trees and/or uprooted trees, standing waters or watercourses with rich ichthyofauna (multi-species fish stock with fish fractions of different ages); site at least 500 m away from road infrastructure and compact buildings; no intensive development. **Opportunities for species conservation (FV):** Breeding success in each year (visible flying chicks)	No effect on the deterioration of the favourable conservation status of the species in the area.
18	A070 Merganser migrating and wintering population	up to 10,000 individuals	The species was observed several times, the most numerous were 42 specimens	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure in the coastal water belt between Chałupy and Jastarnia during autumn migration (U2**):No or little scaring off at each key site. **Degree of anthropopressure in the coastal water strip between Chałupy and Jastarnia during wintering (FV):** No scaring off or scaring off at each key site at low levels. **The degree of anthropopressure in the coastal water strip between Chałupy and Jastarnia during spring migration (U1):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover on at least 50% of the inner Bay of Puck maintained throughout the wintering period, no increase in anthropopressure during autumn and spring migration and during wintering in the coastal strip between Chałupy and Jastarnia, implementation of the programme for limiting bird mortality by bycatch (PoŚPWP)	No effect on the deterioration of the favourable conservation status of the species in the area.
19	A125 Eurasian coot	up to 26,000 individuals	Small groups of up to 40 birds were recorded within the harbour	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Food Base Abundance (FV):** No downward trend in zoobenthos biomass (less than 50% decrease) from the reference value of 70,552 g/m^2 **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during fall migration (U1-U2)**:No scaring off or little crowding at each key site.	No effect on the deterioration of the favourable conservation status of the species

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species: Construction phase	Impact of the project on the species: Operation phase	Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
						Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during wintering (FV): No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites (mouth of the Plutnica River, mouth of the Reda River) during spring migration (FV):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance stable over the last 6 years, no ice cover over at least 50% of the inner Puck Bay maintained throughout the wintering period, no increase in anthropopressure during autumn migration, no downward trend in zoobenthos biomass relative to the reference value, spring and wintering at key locations (the mouth of the River Puck). Reda and Płutnica), implementation of a program to reduce bird mortality due to bycatch	in the area.
20	A130 Oystercatcher Breeding population	5-7 pairs	The nearest breeding grounds are within 15 km of the project boundary.	No impact	No impact	**Abundance (FV):** Abundance stable over the last 3 years at a minimum of 2 pairs. **Habitat (U1):** Beaches occupied by the species not cleaned in spring, difficult to access for people (far from entrances, in harbours), lack of reed on at least 50% of areas in Beka, Mechelińskie Łąki, Słone Łąki and Torfowe Kłyle ecological site **Degree of anthropopression in the Reda River estuary (U1):** No or little anthropopression **Opportunities for species conservation (FV):** Breeding success in each year (visible flying chicks), no plans for investments causing disappearance/destruction of currently occupied habitats, and if there is a threat of habitat destruction - implementation of compensatory measures as required by the decision on environmental conditions.	No impact of the project on the species and no deterioration of favourable conservation status.
21	A130 Oystercatcher Migratory population	up to 345 birds	The species was not recorded within the project area	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Occurrence of suitable biotopes (FV)**: The length of shoreline occupied by bays and small ponds at key locations* *does not fall below 30% of the waterbody shoreline. **Food Base Abundance (FV):** No downward trend in the density of invertebrates in Rybitwia Mielizna and at the mouth of the river Reda (a decrease of less than 50%) relative to the reference value of 0.149/100 cm^3 of substrate and 153.8/100 cm^2 of Barber trap catch area, from July to September **Degree of anthropopressure at key sites** during fall migration (U1-U2)**:No scaring off or little scaring off at each key site. **Degree of anthropopressure at key sites* during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites** during spring migration (FV):** No scaring off or scaring off at each key site at low levels.	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species		Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
				Construction phase	Operation phase		
						Chance of species conservation (U1): Abundance low but stable in the last 8 years, the length of shore occupied by bays and small ponds does not fall below 30% of the basin's shoreline, no downward trend in zoobenthos density in relation to the reference value, anthropopressure in key areas is not increasing.	
22	A137 Ringed plover Breeding population	10 pairs	The species nests on the beach on the east side of the T1 terminal	No impact on breeding habitats	No impact	**Abundance (FV):** Abundance stable over the last 3 years at a minimum of 4 pairs. **Habitat (U1):** Species-occupied beaches not cleaned in spring, difficult to access for people (away from entrances, in harbours, etc.) **Degree of anthropopression in the Reda River estuary (U1):** No or little anthropopression **Opportunities for species conservation (U2):** Breeding success in each year (visible flying chicks), no plans for investments causing disappearance/destruction of currently occupied habitats, and if there is a threat of habitat destruction - implementation of compensatory measures as required by the decision on environmental conditions.	No effect on the deterioration of the favourable conservation status of the species in the area.
23	A149 Dunlin Breeding population	0 pairs	Potential breeding grounds are located more than 50 km from the project area	No impact	No impact	**Abundance (U2):** Abundance stable over the last 3 years at a minimum of 2 pairs. **Habitat (U1):** 40% of meadows in Beka reserve without dense reeds, presence of stagnant water, lack of anthropopressure and predatory pressure in the reserve. Beka or anthropopressure and predation pressure at low levels **Degree of anthropopression in the Reda River estuary (U1):** No or little anthropopression **Opportunities for species conservation (U2):** Breeding success each year (visible flying chicks), carrying out appropriate protection activities in the Beka reserve, consisting in particular of controlled cattle grazing and reed mowing, and predator elimination	No effect on the deterioration of the favourable conservation status of the species in the area.
24	A149 Dunlin Migratory population	up to 13,500 individuals	Groups of birds (up to 10 individuals) were found on the beach on the eastern side of the project	No impact on species habitat	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Occurrence of suitable biotopes (FV)**: The length of shoreline occupied by bays and small ponds at key locations* *does not fall below 30% of the waterbody shoreline. **Food Base Abundance (FV):** No downward trend in the density of invertebrates in Rybitwia Mielizna and at the mouth of the river Reda (a decrease of less than 50%) relative to the reference value of 0.149/100 cm^3 of substrate and 153.8/100 cm^2 of Barber trap catch area, from July to September **Degree of anthropopressure at key sites** during fall migration (U1-U2)**:No scaring off or little scaring off at each key site. **Degree of anthropopressure at key sites* during wintering (FV):** No scaring off or scaring off at each key site at low levels.	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species		Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
				Construction phase	Operation phase		
						Degree of anthropopressure at key sites during spring migration (FV):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance low but stable in the last 8 years, the length of shore occupied by bays and small ponds does not fall below 30% of the basin's shoreline, no downward trend in zoobenthos density in relation to the reference value, anthropopressure in key areas is not increasing.	
25	A160 Eurasian curlew Migratory population	up to 150 birds	Single birds were reported flying over the area	No impact	No impact	**Abundance (FV)**: Abundance over 6 consecutive years increasing or stable (no significant downward trend) **Occurrence of suitable biotopes (U1)**: The length of shoreline occupied by bays and small ponds does not fall below 30% of the water's edge in key locations for the species*, no reed beds in at least 50% of the area of the reserves: Mechelińskie Łąki, Beka, Słone Łąki and the ecological site of Torfowe Kłyle **Food Base Abundance (FV):** No downward trend in the density of invertebrates in Rybitwia Mielizna and at the mouth of the river Reda (a decrease of less than 50%) relative to the reference value of 0.149/100 cm^3 of substrate and 153.8/100 cm^2 of Barber trap catch area, from July to September **Degree of anthropopressure at key sites** during fall migration (U1-U2)**:No scaring off or little scaring off at each key site. **Degree of anthropopressure at key sites* during wintering (FV):** No scaring off or scaring off at each key site at low levels. **Degree of anthropopressure at key sites** during spring migration (FV):** No scaring off or scaring off at each key site at low levels. **Chance of species conservation (U1):** Abundance small but stable in the last 6 years, the length of shore occupied by coves and small ponds does not fall below 30% of the water's edge in key sites for the species*, protection activities are realized in Beka reserve - maintenance of controlled cattle grazing and reed mowing, as well in the reserve of Mechelińskie Łąki, Beka, Słone Łąki and in the area of the ecological site Torfowe Kłyle there is no downward trend in the number of invertebrates in relation to the reference value, anthropopressure in the key sites is not increasing.	No effect on the deterioration of the favourable conservation status of the species in the area.
26	A184 European herring gull Breeding population	90 pairs	The species nests on breakwaters within the harbour.	No impact on breeding habitats	No impact	**Population (FV)**: Abundance stable in the last 3 years at 50 pairs **Habitat (U1)**: presence of nesting habitats (breakwaters, ruins, jetties) properly managed (no tourism or work in the vicinity of nests between 15.04.-15.07). **Opportunities for species conservation (FV):** Breeding success in every year (visible flying chicks), no investment plans causing habitat loss	No effect on the deterioration of the favourable conservation status of the

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species		Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
				Construction phase	Operation phase		
							species in the area.
27	A191 Sandwich Tern Breeding population	140 pairs	The species nests at a distance of 15 km from the investment area	No impact	No impact	**Population (U2)**: Abundance stable in the last 3 years at 30 pairs **Habitat (FV)**: Presence of breeding habitat (sand banks, islands) without anthropopression or presence of terrestrial predators **Opportunities for species conservation (U2):** Breeding success in every year (visible flying chicks), no investment plans causing habitat loss	No effect on the deterioration of the favourable conservation status of the species in the area.
28	A193 Common Tern Breeding population	120 pairs	Birds nest at the Ore Pier in Port Północny	Safe distance from the investment area - no impact	No impact	**Population (FV)**: Abundance stable in the last 3 years at 50 pairs **Habitat (FV)**: Presence of breeding habitat (sand banks, islands) without anthropopression or presence of terrestrial predators **Opportunities for species conservation (U2):** Breeding success in every year (visible flying chicks), no investment plans causing habitat loss	No effect on the deterioration of the favourable conservation status of the species in the area.
29	A195 Little tern Breeding population	35 pairs	The species last nests in the port area	No impact	No impact	**Population (U2)**: Abundance stable in the last 3 years at 20 pairs **Habitat (U1):** Presence of breeding habitat (sand banks, islands) without anthropopression or presence of terrestrial predators **Opportunities for species conservation (U2):** Breeding success in every year (visible flying chicks), no investment plans causing habitat loss	No effect on the deterioration of the favourable conservation status of the species in the area.
30	A200 Razor bill	up to 1700 individuals	The species was not found in the area	No impact	No impact	**Population (U2)**: Abundance stable in the last 3 years at 20 pairs **Area of potential habitat (FV)**: Ice covering less than 50% of the inner Puck Bay throughout the wintering period. **The degree of anthropopressure in the water strip between Chałupki and Jastarnia and in the vicinity of the port of Hel (FV):** No scaring off or scaring off at each key site at low levels. Chance of species conservation (U1): Stable abundance in the last 6 years, annually no ice at a minimum of 50% of the Inner Bay of Puck persisting throughout the wintering period, no increase in anthropopressure during wintering in	No effect on the deterioration of the favourable conservation status of the species in the area.

Item	Species	Population status by source	Status on the investment surface	Impact of the project on the species		Indicators of proper conservation status of protected objects according to Area Management Project * Current status is indicated in brackets	Effects of the investment on the subject of protection in the area
				Construction phase	Operation phase		
						key places*, implementation of the program to reduce bird mortality as a result of bycatch (POPwWP)	
31	A608 Citrine wagtail Breeding population	7-9 pairs	The species does not nest in the area	No impact	No impact.	**Population (FV)**: Abundance stable over the last 3 years at least 7 pairs **Habitat (FV)**: Presence of stagnant water, 30% of meadows in Beka reserve without dense reed **Opportunities for species conservation (FV):** Annual implementation of a plan to maintain suitable habitats in the Beka reserve - maintenance of controlled cattle grazing and reed mowing, and expansion of protective measures to include the elimination of predators	No effect on the deterioration of the favourable conservation status of the species in the area.

Source: own elaboration based on Management Program for Puck Bay Area: Zatoka Pucka i Półwysep Helski (PLH220032) and Zatoka Pucka (PLB220005)" (as of June 2015),

Explanation of conservation status parameter designations: FV - favourable state, U1 - unsatisfactory state, U2 - bad state, XX - unknown (no data available)
* Key sites - (1) coastal water belt along Stogi Island (Port Island), (2) vicinity of Rybitwia Mielizna
** Key sites - (1) the mouth of Reda, (2) vicinity of Rybitwia Mielizna
***Key Places: (1) the stretch of coastal water between Jastarnia and Chałupy, (2) at the mouth of the river Płutnica and (3) at the mouth of the river Reda
**** – average of samples obtained from 5 different sampling points, point 3F - 54^{o}43’53,19”N, 18^{o}23’48,61”E, 19KII – 54^{o}44’05,64”N, 18^{o}34’13,44”E, 36R – 54^{o}41’32,64”N, 18^{o}28’37,20”E, T12 – 54^{o}41’05,28”N, 18^{o}41’16,80”E,KO – 54^{o}29’07,08”N, 18^{o}34’14,52”E
***** Key Places: (1) the stretch of coastal water between Jastarnia and Chałupy, (2) at the mouth of the river Płutnica and (3) at the mouth of the river Reda

8.6.7.2 Impact assessment for the mitigation action area created in connection with the construction of Terminal T 2

The landfall area of the planned project, located approximately 300 m south of the eastern part of the planned T3 terminal, is of key importance as an area of mitigation associated with the previous expansion of the DCT with a T2 terminal. The mitigation activities at the beach and its facilities are carried out here in accordance with the decision of RDOŚ-Gd-WOO.4211.29.2013.AT.9 dated March 28, 2014. In this report, it is reasonable to determine the possible impact of the planned further expansion of the TPD on the effectiveness of mitigation measures.

Characteristics of the site's avifauna, with particular emphasis on species targeted for mitigation, are presented in Chapter 6.

Regular breeding was observed for species to which mitigation was dedicated at the subject site:

– ringed plover Charadius hiaticula.

During 2015-17, 3 to 4 broods of this species were found in the subject area. Ringed plover breeding in this area constituted 75-100% of the breeding population of the species within the entire Natura 2000 site PLB220005 Zatoka Pucka. The possibility of any negative impact of the planned project on the breeding population of the plover would result in a significant impact on the above mentioned mitigation measures and the Natura 2000 site at the same time.

Area monitoring data to date do not confirm breeding of the remaining species to which the above-mentioned mitigation measures were dedicated:

- Little tern *Sterna albifrons*,
- Common shelduck Tadorna tadorna,
- Mergus merganser.

However, they are being considered as potential breeding in the area.

Construction stage

During construction, ongoing work in the water body will frighten resident birds, which may only be significant if it occurs during the breeding season. However, scaring breeding birds in the land area could take place if the works are carried out at a distance of less than 150 m from the breeding areas. The planned works will be carried out more than 300 m from the shore, and therefore will not adversely affect breeding birds, including the breeding population of the ringed plover, as well as species potentially breeding in the area - the least tern, the common shelduck and the merganser.

There is a risk of water pollution by petroleum substances. Plumage of birds soiled with such substances becomes permeable to cold water, which negatively affects the condition of birds. In addition, soiled birds lick and ingest dirt when cleaning their feathers, resulting in illness and death. Events of this type are associated with emergency situations of a random nature. The probability of their occurrence is very low, at the same time, in such a case, appropriate procedures are immediately implemented in order to eliminate the leak.

Operation stage

Operation of the expanded terminal will not adversely affect nesting avifauna, which are dedicated to the mitigation activities conducted at the study area.

Port operation, ship traffic and cargo (container) handling will take place at a distance of more than 350 m from the above-mentioned area. All species subject to the above-mentioned actions did not and do not exhibit sensitivity to analogous actions occurring at the existing DCT development site, at similar or lesser distances from the mitigation site and breeding sites (Figure 107 Location of the mitigation site dedicated to nesting birds against the background of the planned DCT expansion). As such, it is not anticipated that birds will be displaced from shoreline breeding habitat.

The following phenomena, which are indirect effects of the project, are expected to occur during the operation phase of the project in the shoreline zone of the site of the mitigation activities:

- reduction of the wave force,
- increased accumulation of beach sediments, including organic material - wreck line,
- development of wreck line communities.

This will be due to the significant wave protection of this section of shoreline by the wharf structure of the planned terminal. Changes associated with shoreline growth on the east side of Terminal T 1 and increased accumulation of wreck line are already being observed and have been noted, among other things, in reports on the effectiveness of ongoing mitigation efforts.

These phenomena are assessed as positive for least terns and ringed plovers. wreck line, which may appear on shore in greater numbers, provide a foraging base for plovers as an insect habitat. It will also provide a foraging base for other bird species to which mitigation is not dedicated.

However, care must be taken to prevent the growth of plants on the beach (especially willow and reed), whose competitiveness may increase as a result of increased accumulation of organic matter in the coastal zone.

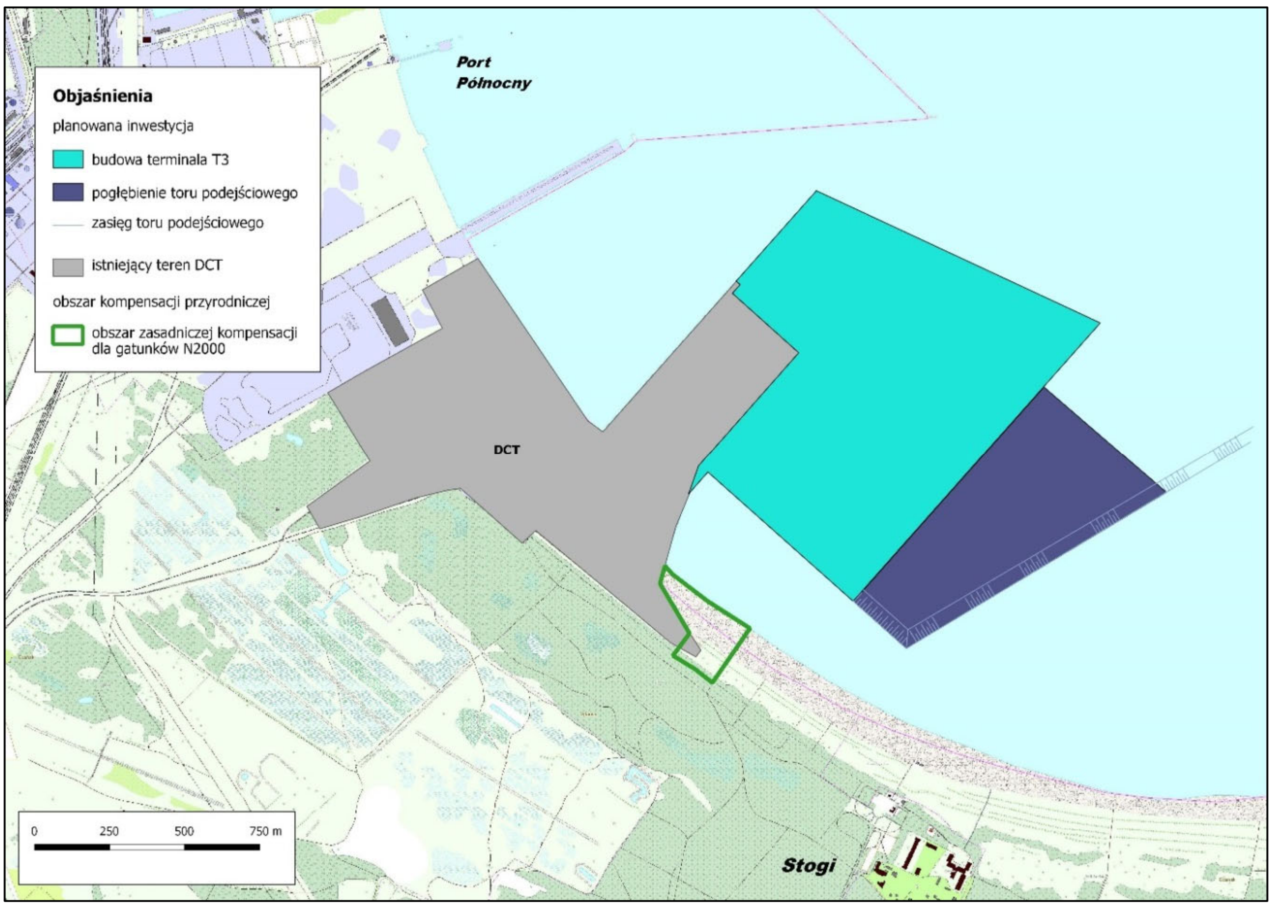

Figure 107 Location of the mitigation site dedicated to nesting birds against the background of the planned DCT expansion

8.6.7.3Impact assessment on other protected areas

Location of other protected areas (apart from the Natura 2000 areas discussed above) at a considerable distance from the investment area precludes direct impact of the planned investment both at the stage of construction and operation.

At the stage of operation - as an indirect effect of limiting the availability of feeding and resting places for waterfowl - an increase in the number of migrating and possibly even wintering waterfowl can be expected in the areas of "Ptasi Raj" and "Mewia Łacha" nature reserves located to the east of the planned project. This will not adversely affect their natural values.

8.7 Impact on monuments

8.7.1 Construction phase

The planned project is located in a fragment of a body of water that is part of the Gulf of Gdańsk. According to data presented in 6.7 Monuments and cultural landscape , the area of the planned project is located beyond the cultural objects lying on the seabed, which have been identified so far. Therefore, it can be concluded that the implementation of the project will not affect the cultural heritage and historical monuments identified so far, especially those under legal conservation protection.

However, according to the results of research carried out in the vicinity of the project, the Port of Gdańsk area is a rich archaeological basin of the Polish Baltic coast. Therefore, taking into account the large area occupied by the planned investment (over 130 ha), one can expect the presence of archaeological monuments undiscovered so far. Therefore, appropriate preventive measures should be taken to preserve them:

- Prior to construction and dredging activities, sonar soundings should be conducted to identify any cultural objects present on the seabed within the project area.
- Notwithstanding this, all bottom intervention works, including dredging, should be carried out under archaeological supervision.

8.7.2 Operation phase

Neither during normal operation of the terminal, nor in the event of an emergency situation, will there be any impact on historic buildings subject to legal protection.

8.8 Impact on land use and development

8.8.1 Construction phase

The phased construction of Terminal T 3 will be several years of changes in land use and development of the planned terminal. It will result in the complete conversion of up to 95 hectares of land intended for a port, loading and storage wharf. Once the berth has been flooded and the technical infrastructure has been implemented, the facilities and equipment necessary to operate the Terminal will be built. All work will be conducted with uninterrupted operation of the existing T 1 and T2 Terminal. During construction activities, no restrictions or barriers to the use of adjacent port lands, community forests, or recreational areas are anticipated. However, it can be concluded that as a result of the works, which will be associated with the movement of vessels, dredging and transport, noise emission in a relatively short distance from the beach and bathing site in Stogi, their recreational attractiveness will be significantly reduced.

8.8.2 Operation phase

In the phase of exploitation of the planned terminal, although it does not interfere directly with the beach and bathing site of Stogi, the small distance to these areas used for recreation will negatively affect their attractiveness. As a result, it is expected that the utilization rate of the beaches and the bathing site, as well as the existing tourist infrastructure (accommodation and catering facilities) will decrease. The visual perception from the beach and bathing site in Stogi will be significantly dominated by the vicinity of the large port facility of the planned T3 terminal, whose presence will become very close and dominant in the analysed coastal strip.

Despite meeting the existing acceptable environmental quality standards for noise and air pollution in areas used for recreation (beach and bathing site), the nearby presence of strong industrial dominants, the constant presence and movement of large vessels (container ships, tugboats), and the specifics of industrial noise will affect the behaviour of tourists and recreationists in the coastal zone and influence their behaviour and choices. This includes the possible abandonment of recreation in the area, although it seems that at the current level of intensity of the aforementioned factors for some beach users this is not decisive in their choice of recreation location.

With regard to the coastal forests in the vicinity of the project, which are used as walking and recreational areas, the operation of the project will not have a significant impact on their current use.

8.9 Impact on the landscape

8.9.1 Construction phase

The planned investment is located within the area of Port Północny and will be compositionally connected with already existing landscape elements, such as the existing DCT wharf with cranes and container storage yards. These are elements that make up the entire ensemble of features that characterize Port Północny landscape. Certainly, the entire harbour complex, of which the designed quay with its infrastructure and berthing ships will also be a part, will constitute a strong dominant feature in the scenic interior of this part of the Gulf of Gdańsk. However, new elements in the landscape will be uniquely identified with the port function that is assigned to this area of the coastal zone.

Underwater, as a result of changes in bottom bathymetry, anthropization of the underwater landscape in the vicinity of the existing water body used by the T 1 terminal will occur, as well as further anthropization of the underwater landscape of the spillway in the Gulf of Gdańsk.

Regardless of how construction is carried out, it is assumed that there will be an impact on scenic values, primarily due to:

- carrying out dredging and artificial flooding of an area of the sea basin of more than 93 ha,
- the establishment and operation of temporary technological elements of the construction site, such as dredgers and pile-driving machines,

- introduction of new hydro-technical infrastructure to the landscape in the form of an artificial wharf on the existing fragment of the sea area of the Gulf of Gdańsk.

Some of these activities, strictly related to construction works, will be of short-term and transitory nature, but in the end, after completion of the construction works, the berth with the Terminal infrastructure will constitute a new, completely artificial, anthropogenic fragment of the sea coast, constituting a strong dominant feature in the landscape.

8.9.2 Operation phase

The port and industrial areas of Gdańsk are characterized by a typically indrustrial, highly transformed landscape, which is under the influence of increasing anthropopression. The planned T3 terminal will fit in both in terms of functional and spatial structure and landscape physiognomy with the existing area of Port Północny in Gdańsk. The development of Port Północny has significantly changed the landscape of the analysed part of the coast in the Stogi district area. In place of the beach and wooded dunes and part of the reservoir, wharves and storage yards and cubic objects were built, as well as communication infrastructure (access road, internal roads and railroad track).

From the standpoint of the aesthetics of the eminently indrustrial port landscape, the planned DCT expansion will not worsen the status quo. This project fits within the intent and strategies of the development while preserving the land areas in the neighborhood without change. However, the implementation of the project will further increase the area occupied by this type of anthropogenic landscape and the creation of new specific waterfront landforms (Figure 108, Figure 109).

The planned Terminal T 3 project will result in permanent, significant visual and landscape changes to Port Północny area. The planned wharf, with a large area of about 95 ha, will contribute to a significant change in the shape of the existing shoreline and the creation of a new form, characteristic and specific in its physiognomy and shape, completely different from the natural forms of the spit coast, but also from the existing wharves of Port Północny.

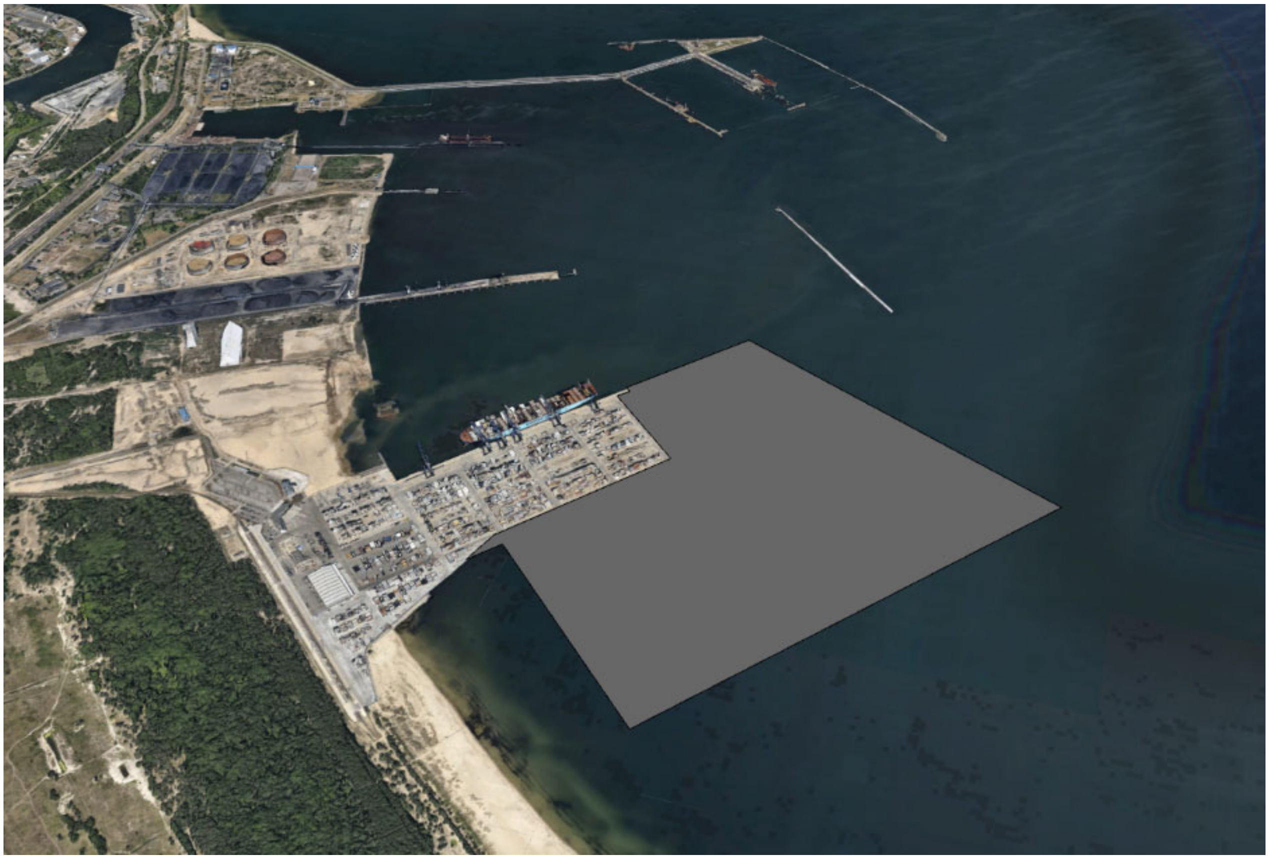

Figure 108 Visualization of the DCT berth transformation after the planned extension of the DCT3 terminal - bird's eye view from the east.
Source: own compilation based on GoogleEarth

Figure 109 Visualization of the DCT berth transformation after the planned extension of the DCT3 terminal - bird's eye view from the southern side.
Source: own compilation based on GoogleEarth

Undoubtedly, the planned new terminal T 3, together with the existing DCT, will be the dominant landscape feature in the scenic interior of the Bay of Gdańsk. With good visibility and calm seas, the vessel moored at the quay and the cranes will be visible from a considerable distance, both from the open sea and from land.

Currently, the view opening from Stogi to the sea in the northwest direction is dominated by elements of the industrial and infrastructural landscape of the existing DCT berth. Specific, highly visible features include a loading quay, moored container ships, cranes, and storage yards.

The planned project to build another T3 terminal together with a quay will further strongly transform the landscape in this area. These changes will be felt due to the large size of the planned terminal (an area of about 95 ha), the specific form of the terminal, and the short distance to natural fragments of the dune coastline, including the beach and bathing site in Stogi. As a strong landscape dominant constituting an artificial element, its presence in close proximity to recreational areas (beach, bathing site) will be associated as a negative landscape transformation.

At the same time, the container terminal is an element unambiguously identified with the port function, which is an important function of the city of Gdańsk and determines its identity. For certain segments of the population, a rapidly growing container terminal whose operations involve the presence of large, modern vessels can be seen as an attractive form of industrial landscape.

8.10 Impact on tangible assets

8.10.1 Construction phase

Planned construction activities and the necessary scope of infrastructure reconstruction will not cause significant negative impacts on existing facilities and development of adjacent areas. No impact on material goods is expected.

8.10.2 Operation phase

There are material assets in the vicinity of the proposed project that are development elements of the existing DCT Terminal. Equipment such as reloading cranes and cranes, buildings, storage yards, and equipment are integrally related to the terminal's reloading activities and after its expansion will become elements functionally related to the planned investment. As such, no adverse impacts to physical assets are anticipated.

The functioning of the extended DCT Terminal will increase the value of the adjacent port area and contribute to a further measurable increase in the functionality and competitiveness of the Port of Gdańsk. Implementation will accelerate the construction of other important investments, including the railroad bridge over the Martwa Wisła river and others.

8.11 Impact on human health and living conditions

8.11.1 Construction phase

During implementation of Terminal T 3, local impacts of an intermittent nature will include:

- noise emissions associated with the operation of construction equipment and machinery, automobiles, and vessels,
- vibrations from the construction site,
- air pollution caused by increased traffic of heavy construction equipment and transportation,
- increase in water turbidity levels (reduction in transparency) caused by dredging and dredge spoil disposal activities in the area of the proposed terminal.

These impacts will be temporary, short-lived, limited in scope, will occur at the construction site and will mainly affect a group of contractors, and the nuisance to workers will be mitigated by personal protective measures resulting from occupational health and safety regulations and appropriate work organization.

The beach in Stogi and the sea bathing site will remain outside the direct zone of works related to the investment, however, due to the relatively short distance to its individual elements, nuisance may be felt mainly from :

- noise emitted during the work;

- an increase in the turbidity of seawater,
- deterioration of the panoramic view of the sea - its considerable disturbance by the terminal under development, as well as by equipment, vehicles and vessels participating in construction works.

These impacts may adversely affect the comfort of human recreation in the recreational area of the beaches in the Stogi district.

8.11.2 Operation phase

During the operation of DCT Terminal 3, impacts will include:

- noise from handling equipment and transport vehicles,
- air pollutant emissions,
- discharge of treated wastewater into the harbour basin,
- permanent disruption of the view opening from the beach strip and dunes to the water area of the Gulf of Gdańsk

The impact on human health and living conditions in the case of the discussed project may concern primarily local changes in the acoustic climate and aerosanitary condition.

Permissible noise levels in the environment are regulated by the Regulation of the Minister of Environment of 14 June 2007. The Regulation establishes varying permissible noise levels, depending on the land use. Normative limit values for noise from road sources (the dominant noise source in the city) are shown below :

- for the areas of multi-family housing, collective housing, housing and services establishments (most of the development in Stogi district) and recreational areas (the area of the designated bathing beach) during daytime 55 dB and during night time 45 dB.

As demonstrated by the results of the impact analyses in this chapter report - the planned project will not cause exceedances of acceptable noise standards:

- in residential areas of Stogi district,
- in the recreational areas of the beach and bathing site during daylight hours.

According to the modeling results, the noise intensity in the bathing site area will exceed the normative value of 45 dB during the night, but this does not apply to the area of the designated bathing site, but only to a few dozen square meters of the beach at the junction with the Port of Gdańsk boudary. In addition, this value is not a normative value in this case, because according to the above-mentioned regulation in the areas of recreation and leisure, the permissible noise level for night time does not apply if these areas are not used in accordance with their function at night time.

Despite meeting acceptable noise standards, it should be noted that a subjective sense of noise, which can cause feelings of fatigue and discomfort, may occur at different sound intensities due to individual sensitivity and acoustic sensitivity, which is an individual characteristic. Nevertheless, values qualified as low noise annoyance (52dB/A - according to the methodology for assessing traffic noise annoyance - cf. Table

71) are higher than expected in the bathing zone. Therefore, it should be assumed that the planned investment will not significantly affect the acoustic climate important for maintaining appropriate comfort of recreation in the recreational area of Stogi beach.

Table 71. Subjective scale of traffic noise annoyance

Noise level values	Description
$L_{Aeq} < 52$	low noise nuisance
$52 \le L_{Aeq} \le 62$	average annoyance
$63 \le L_{Aeq} \le 70$	high annoyance
$L_{Aeq} > 70$	very high annoyance

Source: Kurpiewski A., Kucharski R. J., Pełka W., 1998, Wskazówki metodyczne opracowania planu akustycznego miasta średniej wielkości, Państwowa Inspekcja Ochrony Środowiska, Biblioteka Monitoringu Środowiska, Warszawa.

The nearest residential development is located approximately 1.7 km south of the planned project in the Stogi district, in the area of Pusty Staw. The area will not experience any impacts on the acoustic climate due to the operation of the planned project.

As already demonstrated in this Report, no adverse air pollutant impacts are anticipated that would affect human living conditions, including recreational use of the beach area. The impact of T3 Terminal operation on the health of the residents of the city of Gdańsk, and, most importantly, the closest district of Stogi, as well as the employees of Port Północny can be considered negligible.

Potential emergencies may occur: during handling containers with hazardous cargo, as a result of defects in materials or human error, but the impacts in this case will mainly affect Terminal T3 employees or port emergency services workers, and their range will be limited to the DCT area - they will cause possible health and safety effects, and not environmental hazards in the sense of environmental protection regulations.

In conclusion, the impact of the planned investment on the living conditions of the residents of Stogi, taking into account the predicted condition of the environment in the places of permanent residence as well as within the recreational areas, should be considered insignificant. No exceedances of acceptable environmental quality standards will occur in these areas.

It should be noted, however, that in the case of the analysed project the impact on the recreational conditions of people should be considered also from the point of view of close proximity of a large industrial facility, which affects the negative perception of the recreational landscape, regardless of the actual state of the quality of its components (acoustic climate, air pollution, water purity). The close proximity of the port quays, reloading facilities, the movement of large container ships, as well as the noise and air pollution emitted (despite maintaining acceptable standards) may have a subjective impact on people's recreational conditions and perception of the attractiveness of the seaside recreational space.

Recreational use areas located within 1 km of the proposed project include:

- the designated bathing site in Stogi - is located approximately 610 m from the quay of the planned terminal and approximately 330 m from the area of the planned dredging works),
- Stogi sea beach - the nearest beach entrance with seasonal facilities (trash garbage cans, etc.) is about 670 m from the planned pier, while the strip of beach currently used for recreation is at a minimum distance of about 430 m from the edge of the planned terminal and about 340 m from the dredging area
- recreation areas in the area of Stogi - the nearest existing ones are located at a distance of approx. 850 m from the terminal and respectively approx. 720 m from the dredging site.

Relative to the aforementioned recreation and leisure zones, the distance of DCT facilities will decrease significantly from the status quo. Currently, the nearest used quay T 1 is located at a distance of 1.5 km from the bathing site in Stogi and nearly 1.2 km from the nearest beach entrance. It should be anticipated that recreation and leisure conditions in the coastal area of Stogi (bathing site, beaches) may be subjectively perceived as deteriorated, compared to the current ones, but this will not have a significant impact on those users of this recreational area who have been using it so far.

8.12 Earth mass and waste management

8.12.1 Construction phase

Construction works associated with site preparation and implementation of the planned project will generate waste. This requires work contractors to carry out waste management in accordance with the provisions of the Waste Act.

The works will begin with the preparation of the area for construction by separating the appropriate segments of the basin to be flooded with the use of sheet pile walls. These segments will be filled with compact material and geotechnically reinforced and protected from deterioration. The construction technology has not yet been determined, but it is possible to use prefabricated elements to build the superstructure, and it is also possible to use *in situ* techniques, during which the structural elements are formed through the process of appropriate reinforcement and concreting of previously prepared segments. The need to replace the soil with more load-bearing soil cannot be ruled out, as well as the use of soil strengthening techniques without soil replacement. The variety of possible forms of carrying out the process of flooding is basically ambivalent to the environmental impact assessment in every aspect, because this variety comes down to many possible techniques, methods, ways of organization, but does not result in new types of impacts.

On the land acquired from the sea basin, construction works will be carried out as on land.

When vessels are working - the waste generated on them will be subject to the additional regulations for vessels.

The preparatory activities together with the investment execution phase will be the source of waste generation, which must be removed from the area of the planned project, segregated, properly for specific groups and types, temporarily stored or used.

During the construction period, all waste will be selectively collected in containers or in separate places with easy access for waste collectors, with whom the contractors will have appropriate agreements. Waste generators and waste recipients must have the appropriate permits from the administrative authorities to conduct waste management activities. Waste classified as hazardous requires special attention during management.

In the course of construction works, waste belonging to the 17th group of the Regulation of the Minister of Environment of 9 December 2014 on the catalogue of waste - waste from construction, repair and disassembly of buildings, in particular, the waste indicated in the table below, will be generated.

Table 72 Wastes from construction, repair and dismantling of buildings

17	Waste from the construction, repair and demolition of buildings and road infrastructure (including excavated soil from contaminated sites)
17 01 01	Concrete waste and concrete rubble
17 01 07	Mixed concrete, brick, ceramic materials waste and equipment components other than those mentioned in 17 01 06
17 02	Waste wood, glass and plastic
17 02 01	Wood
17 04	Waste, scrap metal and metal alloys
17 04 05	Iron and steel
17 05	Soil and earth (including soil from contaminated sites and dredge spoil)
17 05 04	Soil and earth, including stones, other than those mentioned in 17 05 03
17 05 06	Dredging spoil other than those mentioned in 17 05 05
17 09	Other wastes from construction, renovation and dismantling
17 09 04	Mixed waste from construction

Other waste that will be generated at the stage of project implementation is waste from groups:

- 15-packaging waste (packaging of building materials)
  - code 15 01 01 - paper and cardboard packaging
  - code 15 01 02 - plastic packaging.
  - code 15 01 03- wood packaging
  - code 15 01 04 - metallic packaging
  - code 15 01 06- mixed packaging waste
  - code 15 01 07- glass packaging
- 20-municipal waste (waste related to the functioning of construction facilities):
  - code 20 03 01- non-segregated (mixed) municipal waste,
- 08-wastes from the manufacture, formulation, marketing and use of protective coatings (wood preservatives)
  - code 08 01 11*- waste paint and varnish containing organic solvents or other dangerous substances
  - code 08 01 12- waste paint and varnish other than those mentioned in 08 01 11.

According to the Waste Act, the principle of proper waste management is to prevent or minimize the generation of waste, to remove it from its source, and to use or neutralize it in a manner that protects human health and life and the environment. The following activities will be conducted at the site to implement this principle:

- rational material management,
- work will be carried out with due care to eliminate damage to installed elements (e.g. reinforcement, curbs, cables, etc.), which will minimize waste,
- the waste generated will be temporarily accumulated on the construction site in a selective manner in designated places (concrete rubble, steel waste, wooden waste) and marked containers/containers (waste from group code 15, municipal waste),

- hazardous waste will be collected in appropriate containers,
- waste collection areas, as defined by the contractor in the Construction Site Plan, will be marked and secured against unauthorized access (especially with regard to hazardous waste),
- waste receivers will be specialized units with appropriate permits in the field of waste management or individuals,
- transport of waste from the construction site will be carried out by entities holding the authorization to conduct this type of activity,
- collection of municipal waste will be provided in accordance with the terms of the Act on Maintaining Cleanliness and Order in Municipalities,
- transport of hazardous waste will be performed by entities authorized to transport hazardous waste and, where applicable, will be in accordance with the regulations on the carriage of hazardous goods by road, including the European ADR agreement.

With regard to the issue of earth masses, i.e. dredged material and material used for flooding, it cannot be ruled out that streams of these substances will be at least partially subject to the provisions of the Waste Act. As follows directly from Article 2 of the Waste Act, its provisions do not apply to:

- uncontaminated soil and other naturally occurring materials excavated during construction activities, provided that the material is used for construction purposes in its natural state on the site where it was excavated;
- sediments moved within surface waters for the purpose of managing waters or fairways, managing waters or water facilities, or protecting against flooding or mitigating the effects of floods and droughts, reclamation, revegetation, land acquisition, or land treatment, if the sediments are not hazardous.

Failure to meet the aforementioned criteria will make the movement or use of dredged material for flooding, or the importation and use of earth masses for flooding, to be carried out only in a waste management procedure. When such conditions are identified - such procedures will be followed. However, the analyses available at this stage of the reconnaissance indicate that there is a high probability that waste management procedures will not be required.

Available research indicates that sediments within the port of Gdańsk are not contaminated. This is evidenced by studies cited in environmental impact reports[30], as well as those provided by ZMPG SA:

"Prior to dredging, bottom sediments in the area of the planned work must be tested to determine if the dredged material is contaminated. The scope of research includes determination of: arsenic, chromium, zinc, cadmium, copper, nickel, lead, mercury, polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB). The number of samples taken for testing depends on the anticipated volume of dredging work. The studies of bottom sediments in most of the basins under the management of ZMPG SA indicate that the dredged material is not contaminated and can be managed by depositing it at sea." *(Source: http://www.portgdansk.pl/o-porcie/badania-osadow)*

The dredged volume of the planned project was estimated at 4,000,000 m^3 (approx. 10,000,000 tons). According to the reconnaissance, which results from the information available for the projects planned to be executed in the area of the said project, 50-60% of this volume (2-2.4 million m^3) consists of silts requiring storage on the maritime flapjack, and 40-50% of sands (1.6-2 million m^3) suitable for use in flooding of the sea basin.

On the other hand, inundation of up to 95 ha of the sea basin, which currently has an average depth of about 7 m to the terminal pier's ordinate of 3 m above sea level, will require filling a volume of about 10,000,000 m^3 with earth and rock masses, construction materials, reinforcing elements, etc.

[30] The environmental impact reports related to the projects implemented in the area of the discussed project should be considered as particularly relevant and authoritative here, i.e. first of all the report on the extension of the approach fairway with the increase of its width and technical depth together with the construction of a turning basin with a diameter of 750 m" (Transprojekt 2015) and the report on the protective breakwaters in Port Północny in Gdańsk" (Orbital, 2015) - during the preparation of which the studies and analyses included in the studies were used:
"Assessment of the possibility of using the dredged material associated with the modernization of the approach fairway to Port Północny within the project: "Port Północny modernization of the approach fairway and island breakwater". Determine the impact of dredging on the environment and on Natura 2000 sites for the three proposed alternatives. Maritime Institute of Gdańsk, Gdańsk, 2012;
Assessment of the possibility of using dredged material for modernization of the approach fairway to Port Północny within the project "Port Północny - Modernization of the approach fairway and island breakwater". Report on collection and examination of core samples, Department of Operational Oceanography of the Marine Institute in Gdańsk, Polish Geological Institute, National Research Institute, Division of Marine Geology, Gdańsk, April 2012.

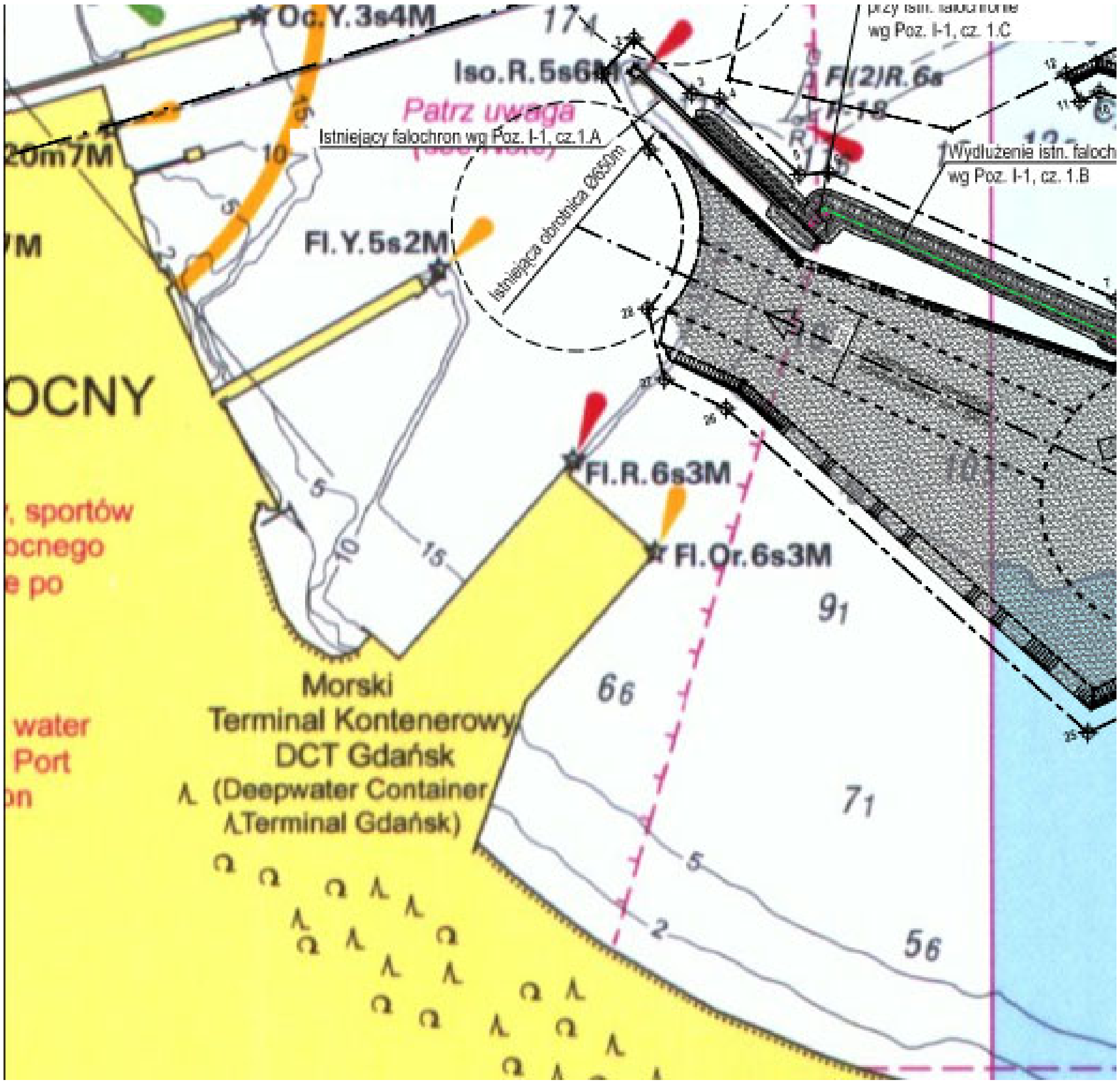

Figure 110: Bathymetry in the area of the planned investment
Source: [Orbital, 2015] an excerpt from the "Orientation Plan of the Proposed Development" in the "Construction Project of the Approach Fairway with Turning Basin"

As far as technically and geotechnically feasible, as much of the dredged material from the dredging of the fairway at T 3 will be used in the process of flooding the offshore area for T 3. It cannot be excluded that in the course of the project implementation other projects will be carried out in the area, which will become a natural source of material to be used for flooding of the predicted area of the sea basin. One should also anticipate the possibility that in order to obtain this material, a new undertaking will be initiated related to the extraction of the respective mineral from the maritime areas or to dredging of the approach fairway to the port in Gdynia or in Gdańsk or Elbląg or other similar undertaking. Each of these projects will be considered only functionally related to the construction of T 3 and each of these projects will be subject to separate consent procedures, including, for example, if offshore aggregate extraction[31], or dredging of the fairway[32], there will be environmental impact assessment procedures.

[31] § 3 section 1 item 41 of the Regulation of the Council of Ministers on projects which may significantly affect the environment (i.e. Dz.U. of 2016, item 71).
[32] § Paragraph 3.2.1 in conjunction with Paragraph 2.1.34 of the aforementioned Regulation.

Approximately 2-2.4 million m^3 of the silts will be moved to the so-called "DCT dumping site", which was previously used to deposit dredged material generated during the construction of the first DCT terminal and the reconstruction of the waterway on the Martwa Wisła and Motława rivers. The area of this flail is approximately 4 km^2, so the uniform distribution of 2.4 million m^3 of silt will result in an additional layer of silt approximately 60 cm thick at a depth of approximately 55 to 60 m below sea level. The WGS-84 coordinates of the "DCT flapper" of the projected deposition area are: $54^0$30'N, $18^0$53'E; $54^0$30'N, $18^0$55'E; $54^0$29'N, $18^0$53'E; $54^0$29'N, $18^0$55'E. Another place of storage of sludge may be the sea dump "Gdańsk" with an area of 2.69 km^2 located at a depth of 30 m above sea level. Coordinates of the central point of the "Gdańsk" dumping site: $54^0$30'N, $18^0$50'E.

8.12.2 Operation phase

Currently, waste management in the exploitation phase is carried out on the basis of general principles resulting from the regulations, in particular from the Waste Act and on the basis of the decision of the Marshal of Pomorskie Voivodeship, DROŚ-SO.7243.8.2007.EŻ, dated 7.4.2017 on the permit for the production of waste resulting from the exploitation of the system, as well as on the basis of the approved by the decision of the Marshal of Pomorskie Voivodeship No. DROŚ-SO.7240.10.2017, dated 03.10.2017 "Port Waste and Cargo Residues from Ships Management Plan" approved established by the Port of Gdańsk Authority in accordance with the Port Waste and Cargo Residues from Ships Act of 12 September 2002.

The aforementioned permit is included in **Appendix 8.12-1** - its content describes in a concise manner the manner of handling waste at the terminal. Information on the procedure and method of collecting waste from sea-going vessels in the Port of Gdańsk is available on the Internet:

- https://www.portgdansk.pl/zegluga/odbior-odpadow

as well as the "Port Plan for the Management of Waste and Cargo Residues from Ships."

- http://www.portgdansk.pl/port/waste_disposal/portowy-plan-gospodarowania-odpadami-2014.pdf

Waste management to be carried out at the terminal after the expansion will refer to the same technological processes, the same types of waste, and only the amounts of waste generated will increase due to increased cargo turnover, more equipment used, etc.

Below are two tables of summary data on types and quantities of waste, on ways of managing them and on plants and devices for recovery or disposal of waste - prepared by DCT for 2016 and 2017. These statements show what waste and in what quantities was generated by DCT:

Table 73 Summary data on types of waste generated - for 2016

Dział 2. Zbiorcze zestawienie danych o rodzajach i ilościach wytworzonych odpadów[12)]

Lp.	Kod odpadów[13)]	Rodzaj odpadów[13)]	Masa wytworzonych odpadów [Mg][14)]	
			masa odpadów	sucha masa odpadów
1	07 01 04*	Inne rozpuszczalniki organiczne, roztwory z przemywania i ciecze macierzyste	**0,110**	
2	13 02 08*	Inne oleje silnikowe, przekładnikowe i smarowe	**41,520**	
3	13 05 08*	Mieszanina odpadów z piaskowników i z odwadniania olejów w separatorach	**178,500**	
4	13 07 03*	Inne paliwa	**0,500**	
5	15 01 03	Opakowania z drewna	**187,080**	
6	15 02 02*	Sorbenty, materiały filtracyjne (w tym filtry olejowe nieujęte w innych grupach), tkaniny do wycierania (np. szmaty, ścierki) i ubrania ochronne zanieczyszczone substancjami niebezpiecznymi (np. PCB)	**16,585**	
7	16 01 03	Zużyte opony	**17,100**	
8	16 01 14 *	Płyny zapobiegające zamarzaniu zawierające niebezpieczne substancje	**1,000**	
9	16 02 13*	Zużyte urządzenia zawierające niebezpieczne elementy inne niż wymienione w 16 02 09 do 16 02 12	**0,074**	
10	16 02 14	Zużyte urządzenia inne niż wymienione w 16 02 09 do 16 02 13	**0,199**	
11	17 04 05	Żelazo i stal	**55,808**	
12	17 04 11	Kable inne niż wymienione w 17 04 10	**13,330**	
13	17 09 04	Zmieszane odpady z budowy, remontów i demontażu inne niż wymienione w 17 09 01, 17 09 02 i 17 09 03.	**3,890**	
14	19 08 09	Tłuszcze i mieszaniny olejów z separacji olej/woda zawierające wyłącznie oleje jadalne i tłuszcze	**3,800**	

Table 74 Summary data on types of waste generated - for 2017

Dział 2. Zbiorcze zestawienie danych o rodzajach i ilościach wytworzonych odpadów[12)]

Lp.	Kod odpadów[13)]	Rodzaj odpadów[13)]	Masa wytworzonych odpadów [Mg][14)]	
			masa odpadów	sucha masa odpadów
1	07 01 04*	Inne rozpuszczalniki organiczne, roztwory z przemywania i ciecze macierzyste	0,100	
2	13 02 08*	Inne oleje silnikowe, przekładnikowe i smarowe	28,900	
3	15 01 10*	Opakowania zawierające pozostałości substancji niebezpiecznych lub nimi zanieczyszczone	0,860	
4	15 02 02*	Sorbenty, materiały filtracyjne (w tym filtry olejowe nieujęte w innych grupach), tkaniny do wycierania (np. szmaty, ścierki) i ubrania ochronne zanieczyszczone substancjami niebezpiecznymi (np. PCB)	22,720	
5	16 01 03	Zużyte opony	19,440	
6	16 02 13*	Zużyte urządzenia zawierające niebezpieczne elementy inne niż wymienione w 16 02 09 do 16 02 12	0,133	
7	16 02 14	Zużyte urządzenia inne niż wymienione w 16 02 09 do 16 02 13	0,534	
8	16 06 01*	Baterie i akumulatory ołowiowe	4,226	
9	16 06 05	Inne baterie i akumulatory	0,095	
10	17 04 05	Żelazo i stal	139,248	
11	17 04 11	Kable inne niż wymienione w 17 04 10	4,989	
12	17 09 04	Zmieszane odpady z budowy, remontów i demontażu inne niż wymienione w 17 09 01, 17 09 02 i 17 09 03.	11,950	
13	19 08 09	Tłuszcze i mieszaniny olejów z separacji olej/woda zawierające wyłącznie oleje jadalne i tłuszcze	2,320	

Each of the three phases of the DCT terminal expansion could increase waste volumes by approximately 50% over the volumes indicated in the tables above. These quantities are not large enough to affect the organization of proper management of this waste or the ability to find authorized recipients of the waste. At the same time, it cannot be ruled out that during the operation of the terminal other types of waste will be generated than those that have been generated so far, which is at least partially reflected in the list of waste types listed in the aforementioned waste production permit.

During the operation of the terminal, waste records are kept using applicable document templates. In conclusion, the problem of waste management during the operation of the DCT Container Terminal will be solved in accordance with legal requirements, and the types and quantities of waste generated will not cause significant problems with their management. Furthermore, the DCT container terminal is one of the relatively few Polish companies which is registered in the EMAS scheme[33], which is an additional guarantee of due diligence in the field of waste management, which is subject to regular activities, including both internal and external audits (at DCT the EMAS verifier is Bureau Veritas Certification Polska Sp. z o.o.). Waste handling is regulated by the procedure DCT/DOC/SC/7.01 "Principles of waste management on the premises of DCT".

[33] No. in EMAS register: PL 2.22-007-80 [http://emas.gdos.gov.pl/lista-rejestru-emas] [Deklaracja środowiskowa za rok 2016: http://emas.gdos.gov.pl/files/artykuly/24009/2017_DS_DCT_Gdansk_icon.pdf] [http://ec.europa.eu/environment/emas/register/search/registration.do?registrationId=590584]

8.13 Impact of the planned extension of the DCT terminal on the environmental objectives set for the Transitional Surface Water Body in the inner Gulf of Gdańsk

8.13.1 Characteristics of transitional water bodies on which the planned project is located

The planned project will be implemented within the basin of the Gulf of Gdańsk. According to the current *Vistula River Basin Management Plan* (adopted by the Regulation of the Council of Ministers of 18 October 2016), this is the area of the transitional surface water body of the Inner Gdańsk Bay with code PLTW IV WB4 (figure below).

The planned project will be implemented outside of the Groundwater Bodies, therefore this aspect of the assessment has been omitted in the assessment of the impact on the environmental objectives set in PGW (2016).

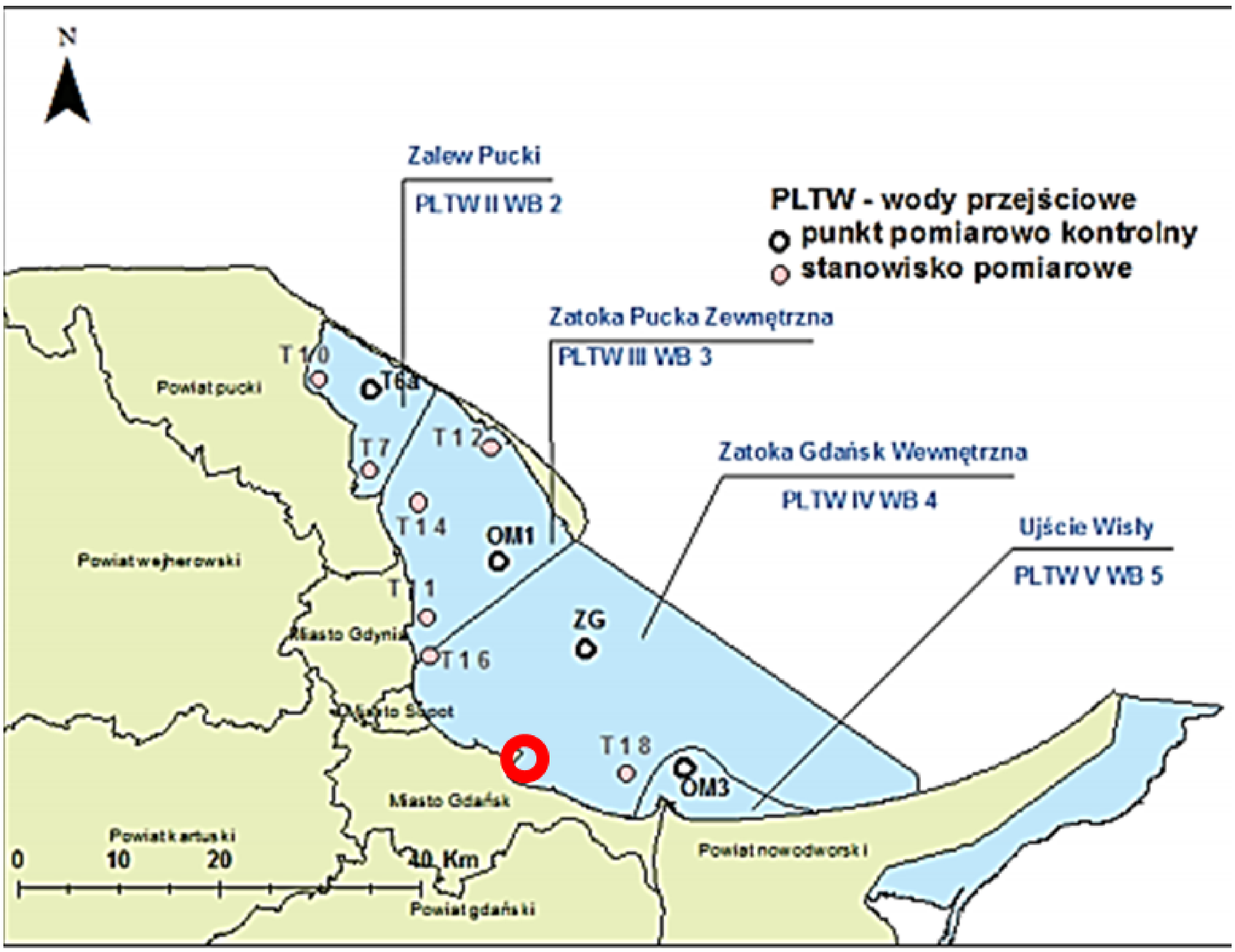

Figure 111: Location of measurement and control points and measurement sites of transitional water bodies in Pomorskie Voivodeship

(Source: Ocena stanu środowiska Polskich Obszarów Morskich Bałtyku na podstawie danych monitoringowych z roku 2016 na tle dziesięciolecia 2006-2015, Inspekcja Ochrony Środowiska, Warszawa 2017 r.)

Characteristics of the transitional watercourse Inner Gulf of Gdańsk

(Source: Vistula River Basin Management Plan, 2016)

Identified water body	JCWP name	Water body code	Type of water body	Status of water bodies	Condition assessment
Transitional	Inner Gdańsk Bay	TW IV WB4	Bay with sandy substrate, periodically stratified	Natural	Ecological: Weak Chemical: not investigated Overall status: bad

The environmental status of the analysed transitional watercourse in the inner Gulf of Gdańsk is analysed within the framework of the State Environmental Monitoring based on two measurement stations and one measurement and control point. The results of the status assessment of the Inner Gulf of Gdańsk Watercourse conducted in 2016 are presented in the table below.

Table 75: Assessment of the status of the CU on the basis of monitoring carried out in 2016

Biological elements			Hydromorphological elements	Physicochemical elements	Specific contaminants	Ecological status	Chemical state	Protected areas	State of the watercourse
Phytoplankton		CLASS V	CLASS I	Below Good Condition	CLASS II	WRONG	Below Good Condition	The requirements have not been met	WRONG
Chlorophyll a	**Class III - moderate**								
Benthic macroinvertebrates									
Indicator B	**Class V - poor condition**								
Ichthyofauna									
SI indicator	**Class IV - poor condition (2015)**								

(Source: Ocena stanu środowiska Polskich Obszarów Morskich Bałtyku na podstawie danych monitoringowych z roku 2016 na tle dziesięciolecia 2006-2015, Inspekcja Ochrony Środowiska, Warszawa 2017r.

Biological elements. In 2016, phytoplankton blooms were observed at measurement site T16 on 9.03.2016, and at site T18 on 11.05.2016 and 7.06.2016. The benthic macroinvertebrate index (multimetric index B) had a value of 1.9 in 2016 and was classified as Class V. Chlorophyll a concentrations were high in 2016. The average over the entire measurement period was 5.09 mg m^3 and the index was classified as Class III. The ichthyofauna indicator was assigned to Class IV (ichthyofauna class is inherited from 2015). The biological elements were classified as class V - bad condition, which was determined by the result of the index of benthic macroinvertebrates (multimetric index B).

The hydromorphological elements were classified as Class I.

Physicochemical elements were classified below good status as a result of exceeding permissible values of the following indicators: nitrate nitrogen, total nitrogen, phosphate phosphorus, total phosphorus, pH reaction, transparency (Secchi disk visibility). Particularly harmful substances - specific synthetic and non-synthetic pollutants were assigned to Class II.

The ecological status of the watercourse was classified as bad. The chemical status of the watercourse was determined to be below good status. Finally, the condition of PLTW IV WB 4 Inner Gdańsk Bay was assessed as bad. Requirements for protected area monitoring were not met.

8.13.2 Assessment of impacts on the environmental objectives of water bodies

When assessing the impact of the planned project on the water body of Inner Gdańsk Bay, it is necessary to refer to the environmental objectives set for individual water bodies in the update of the Water Management Plan adopted in 2016 (currently in force). The main environmental objective set for the analysed watercourse is good ecological status and good chemical status of waters. According to the CU Data Sheet **(Appendix 8.13-1**), the specific objectives are as follows:

- for biological elements - improvement of condition (reaching class II),
- for physicochemical elements - improvement of condition,
- for hydromorphological elements - maintenance of Class I,
- for chemical elements - achieving good chemical status,
- for protected areas intended for recreational purposes, including bathing - meeting the requirement of the absence of the phenomenon of accelerated eutrophication caused anthropogenically, indicating the possibility of algal bloom and meeting the requirements of the Regulation of the Minister of Health of 8 April 2011 on conducting supervision over the quality of water in the bathing site and the place used for bathing (Dz.U.2016. pos. 1602 - uniform text),
- for protected areas designated for the protection of habitats and species: area PLB220005 Zatoka Pucka - maintenance or improvement of the appropriate conservation status; area PLH220105 Klify i Rafy Ramienne Orłowa - maintenance or restoration of the appropriate conservation status.

For the achievement of the environmental objectives indicated above in the PGW (2016), a derogation was obtained - deferral until 2027 of the need to achieve good ecological status and good chemical status, due to the lack of technical and financial opportunities to reduce the constantly occurring anthropogenic impacts from the land, which bring nutrients and pollutants.

The planned project will have an impact on the surface water body at the stage of construction and operation of the project.

8.13.2.1 Construction stage

During the construction phase , impacts are primarily related to morphological transformations of the bottom:

- physical liquidation of a part of the bottom through flooding an area of maximum 95 ha (total of 3 stages of the project),
- transformation at the site of the creation of the fairway, with an area of approximately 38 ha as a result of dredging.

In addition, dredging and construction activities will result in periodic increases in water turbidity and physical removal of benthos: permanent within the flooded bottom and periodic within the fairway.

The percentage loss of the seabed area within the inner Gulf of Gdańsk as a result of inundation of a part of the seabed will be small - 0.1%, while the seabed transformation as a result of the construction of the waterway will cover an area of - 0.05%.

During the construction phase, temporary deterioration of water physicochemical parameters (increased turbidity) is also possible due to dredging for the construction of the new fairway. However, this impact will be temporary and will not pose a threat of not achieving the environmental objectives set in PGW (2016).

The planned project should also not affect the environmental objectives set for protected areas.

8.13.2.2 Operation stage

Impacts on the environmental objectives of the Inner Gulf of Gdańsk transitional watercourse during the construction phase will include:

- management of rainwater from the DCT area,
- maintenance of the fairway (periodic dredging).

Rainwater discharged from industrial areas must meet the requirements established in the Regulation of the Minister of Environment of 18 November 2014 on the conditions to be met when introducing sewage into waters or into the ground, and on substances particularly harmful to the aquatic environment, i.e:

- total suspended solids - below 100 mg/l.
- petroleum hydrocarbons - less than 15 mg/l.

Currently, the operation of DCT Gdańsk S.A. does not cause exceedence of permissible contents of total suspended solids and petroleum hydrocarbons (table below). The results obtained are well below acceptable values.

Therefore, it can be assumed that the expansion of the base will not cause a significant load on the waters of the CU and does not jeopardize the possibility of achieving the environmental objectives set in PGW (2016).

Table 76: Results of 2017 stormwater pollution measurements at DCT

Item	Seperator No.	Date of collection	Temperature [^{o}C]	Petroleum hydrocarbons as an index of mineral oil [mg/l]	Suspended solids [mg/l]
1	II	2017.10.26	8.4	<0.1	14 ± 2
2	2	2017.12.05	8.4	0.5	15
3	1	2017.10.26	8.4	0.2 ± 0.1	17 ± 2
4	3	2017.10.26	8.7	<0.1	28 ± 3
5	4	2017.10.26	8.1	<0.1	21 ± 2
6	5I	2017.10.26	8.4	<0.1	22 ± 3
7	III	2017.10.26	8.7	< 0.1	28 ± 3
8	IV	2017.10.26	8.5	< 0.1	15 ± 2

(Source: data provided by DCT Gdańsk S.A.)

8.13.3 Assessment of the impact of the investment project on environmental objectives related to protected areas

For the inner Gulf of Gdańsk, environmental objectives have been set for two protected areas:

- PLB220005 Zatoka Pucka,
- PLH220105 Klify i Rafy Ramienne Orłowa.

The planned project is located within the Gulf of Puck bird refuge while the habitat area Klify i Rafy Ramienne Orłowa is about 15 km away.

In order to determine whether the planned project may affect the environmental objectives set for protected areas, it is necessary to refer to the favourable conservation status of species and habitats which are the objects of protection in the given area. Maintaining or restoring the favourable conservation status of the following species and their habitats, is the environmental objective of the Watercourse, as established in the Water Management Plan (2016).

Table 77: Assessment of the impact of the planned project on the environmental objectives set for protected areas

Item	Species/habitat protected within the site	Appropriate conservation status as determined by PGW (2016)	Impact on maintenance or restoration of proper conservation status
PLB220005 Zatoka Pucka			
1	Heron	Abundant ichthyofauna food base, heron foraging tolerance, quiet breeding sites	No impact - see section on impacts on birds for details
2	Czernica	Concentrations of tufted duck: preservation of natural wetland ecosystems, in particular preservation of large, shallow reservoirs with developed aquatic vegetation and macrobenthos Wintering grounds of tufted duck: conservation of natural wetland ecosystems	as above
3	Greater scoup	Greater scoup concentrations: safety from bycatch, food base - mainly clams. Wintering grounds of the greater scoup: safety from bycatch, food base mainly clams	as above
4	Goldeneye	Concentrations of goldeneye: preservation of calm bodies of water, especially preservation of large, shallow tanks	as above

Item	Species/habitat protected within the site	Appropriate conservation status as determined by PGW (2016)	Impact on maintenance or restoration of proper conservation status
		with developed aquatic vegetation and macrobenthos, safety from by-catch, food base mainly of mussels Wintering grounds of goldeneye: preservation of calm bodies of water, safety from by-catch, food base mainly of mussels	
5	Dunlin	Concentration of dunlin requires: preservation of beaches, shoals, periodically exposed surfaces from under the water	as above
6	Common ringed plover	Requires preservation in river valleys of natural shoals, periodically uncovered sediments from under the water and the processes of their formation, and on the sea coast preservation of beaches not penetrated by people during the breeding season of the species	as above
7	Whooper swan	Proper conservation status requires the preservation of natural wetland ecosystems.	as above
8	Mute swan	Proper conservation status requires the preservation of natural wetland ecosystems.	as above
9	Eurasian coot	Concentration of Eurasian coot requires preservation of natural wetland ecosystems, particularly large, shallow reservoirs with submerged vegetation Proper conservation status of coot wintering grounds requires: preservation of natural wetland ecosystems.	as above
10	European herring gull	Proper conservation status of the European herring gull requires preservation of natural shores of water bodies and maintenance of existing breeding colonies	as above
11	Velvet scoter	Concentration of urchins requires: safety from bycatch, food base of primarily shellfish. Proper conservation status of the wintering grounds of the scup requires: safety from bycatch, food base. mainly clams.	as above
12	Smew	Proper protection of wintering grounds of the smew requires safety from by-catch, food base of mainly mussels	as above
13	Merganser	Proper conservation status of the barnacle requires: preservation of water bodies with a natural forest shoreline, rich in hollow trees, limiting urbanization of areas around water bodies, limiting recreational pressure and water tourism. Proper conservation status of the wintering grounds of the merganser requires: safety from bycatch, food base. mainly clams.	as above
14	Red-breasted merganser	Proper conservation status for concentrations of red-breasted merganser requires safety from bycatch, the food base. primarily fish. Proper conservation status of the red-breasted merganser requires restoration of the species, exclusion of anthropopressure, including tourism and recreation, on breeding biotopes	as above
15	Citrine wagtail	Proper conservation status requires preservation of the wetland and marsh character of the site	as above
16	Curlew	Adequate conservation status of Eurasian curlew concentrations requires the availability of beaches, river beds or mounds exposed from beneath the water during the species' migration periods	as above
17	Cormorant	Proper conservation status of cormorant concentrations and overwintering requires tolerance of foraging by the species.	as above

Item	Species/habitat protected within the site	Appropriate conservation status as determined by PGW (2016)	Impact on maintenance or restoration of proper conservation status
18	Great crested grebe	Proper conservation status requires the preservation of natural wetland ecosystems. Proper conservation status requires: preservation of natural wetland ecosystems.	as above
19	Little tern	Adequate conservation status requires that current breeding sites and potential sites (usually alluvial meadows on rivers, sandy elevations on floodplains, sometimes ponds, reservoirs, aquatic vegetation) are maintained.	as above
20	Common tern	Proper conservation status requires that current breeding sites be preserved and potential sites be allowed to emerge (usually alluvial bars on rivers, sandy elevations on floodplains, other gravel biotopes, sometimes ponds, reservoirs)	as above
21	Sandwich Tern	Proper conservation status requires preservation of the natural process of deposition and dynamics of the old river beds	as above
22	Common shelduck	Proper conservation status requires the preservation of a natural mosaic of aquatic and wetland ecosystems with natural quiet zones during the breeding season, dry zones with the possibility of breeding in burrows or other hiding places	as above
PLH220105 Klify i Rafy Ramienne Orłowa.			
23	Reefs (1170)	The proper conservation status of fragments of rocky and stony seabed requires intact structure of the seabed, exclusion of fishing pressure with nets dragged along the bottom, unimpaired biodiversity, especially of red algae and mussels.	No impact - investment about 15 km away
24	Cliffs (1230)	Proper conservation status requires preserving the natural processes of their development and abrasion.	No impact - investment about 15 km away
25	Willow, poplar, alder and ash forests	Adequate riparian forest conservation status requires hydration, natural or renaturalized character, and hydrologic regime of streams if adjacent to riparian areas.	No impact - investment about 15 km away

(Source: own elaboration based on the data sheet of JCWP generated from aPGW database http://apgw.gov.pl/pl/II-cykl-materialy-do-pobrania)

8.13.4 Summary

To sum up the assessment of the impact on the environmental objectives set for the protected areas of the transitional water body Zatoka Gdańska Wewnętrzna, the planned project is not expected to affect the possibility to maintain or achieve a proper conservation status of the species and habitats protected in the PLB0005 Zatoka Pucka and PLH220105 Klify i Rafy Ramienne Orłowa areas.

In conclusion, the planned project is not expected to pose a threat to the achievement of environmental objectives set for the transitional water body in the inner Gulf of Gdańsk with the code PL TW IV WB4. This applies to both the construction phase and the operation phase.

8.14 Climate impacts and preparation for climate change

8.14.1 Climactic conditions

Gdańsk is located in an area of inflow of oceanic air masses from the west and their slight influence from the east. The dominant bar systems are the Icelandic Low and the Azores High. Arriving three main types of air masses: polar marine and continental, tropical, arctic, cause a large variability of weather. The vicinity of the Baltic Sea, especially the Gdańsk Deep, influences the thermal and humidity conditions, as does the varied geographical environment, especially the varied relief. The centre of Gdańsk is situated on a flat coastal abrasion-accumulation platform, while the western districts lie on the Gdańsk Upland, exceeding 100 m in altitude, and the eastern part occupies a fragment of the low-lying Vistula delta plain. The annual average atmospheric pressure is about 1015 hPa. The highest atmospheric pressure is recorded in January (about 1016 hPa) and October (about 1017 hPa), the lowest in June (1013-1014 hPa). Extreme values of atmospheric pressure currently range from 967.2 hPa (26.02.1989 in Świbno) to 1050.7 hPa (3.01.1993 in Port Północny). The inter-day fluctuations of atmospheric pressure in the cool half-year (XI-IV) are greater than in the warm half-year.

There is a greater proportion of northerly winds in the summer and spring, and southerly winds in autumn and winter. The varied substrate, orography, and development make the distribution of dominant wind directions at weather stations different. The prevailing winds in Port Północny are south and southwest (38.7%), while in Świbna the prevailing winds are southwest and west (35.6%). Rebiechowo has the most westerly winds (24%). Average annual velocities vary from 3.7 m/s in Świbno to 4.8 m/s in Rębiechowo. The lowest average monthly velocities occur in August (about 3-4 m/s), the highest (about 5 m/s) - at all stations in January. A characteristic feature of Gdańsk is the low frequency of calm, many days with strong and very strong winds (with speeds ≥10 m/s and ≥15 m/s, respectively). Silence occurs with a frequency ranging from about 2% in Świbno, to about 4% in Rębiechowo.

Strong winds are recorded 60 days per year; very strong, stormy winds average 6 days per year from August through April. There is a sea breeze in the coastal zone, local winds are created by differences in the heating of the land and sea, resulting in a pressure difference over water and land. The sea breeze blows from the sea towards the land, bringing pleasant refreshment on hot days. Its impact is limited by multi-story buildings, making ventilation of lower-lying neighborhoods much more difficult.

Average annual air temperatures vary due to the coastal location and varied orography. The highest average is in Port Północny (9.0°C), in Świbno (7.9°C) and in the highest above sea level Rebiechowo (7.2°C). The neighborhoods on the Gdańsk Highlands are cooler than the older neighborhoods located directly on the Gulf of Gdańsk abrasion-accumulation platform. The coldest month is January with average temperatures ranging from -1.5°C in Rebiechowo, to 0.5°C in Port Północny. July is the warmest (in Rębiechowo it averages 17.0°C), in Port Północny it is over 1.5°C higher: 18.6°C. The same average monthly temperature is also found there in August. Autumn is warmer than spring by about 1-2°C, a characteristic of coastal areas. Winters are mild and summers, compared to the rest of the country, are cooler.

However, the variability of absolute thermal extremes is significant. The lowest air temperature (-31.8°C) was recorded in Rebiechowo on 30.01.1987, and the highest (35.8°C) in Świbno on 10.08.1992. The number of frosty days, with maximum temperature not exceeding 0°C, varies from about 20 in Port Północny to over 33 in Rebiechowo. On average, once a year there is a very cold day with a maximum temperature of no more than -10°C. Hot days, with the maximum temperature greater than or equal to 25°C, occur from about 11 in Port Północny to about 18 in Rebiechowo; on average, there are 2 hot days, with the maximum temperature not lower than 30°C.

The annual average overall cloudiness of the sky is about 65%. The highest average monthly cloud cover occurs in November and December (over 76%), the lowest (about 56%) in May and August. The average number of clear days, with total cloudiness ≤20%, ranges from just over 26 days in Rębiechowo, to just over 31 days in Świbno. The average number of cloudy days with ≥80% cloud cover ranges between 126 at Port Północny and 143 at Rebiechowo. The average insolation (the number of hours the sun's disk is visible) is 1641 h/year. Such a high average insolation puts Gdańsk in a privileged position in relation to areas of Poland located beyond the coast where it is lower. Moreover, the average annual values of sunshine exceed the sums adopted for the classification of resorts (1350 h/year) and spas (1500 h/year). The most hours with sunshine occur in May and July (about 250), the least (less than 25) in December.

Average annual precipitation ranges from about 480 mm at Port Północny to over 590 mm at Rebiechowo. The highest monthly precipitation (about 70 mm) is recorded in July or June, the lowest average monthly precipitation falls in February (from 16 mm at Port Północny to 27 mm at Rebiechowo). The fewest rainy days are in April and May, the most in December. Days with high daily total precipitation exceeding 10 mm occur, depending on the station, from 10 to 13, most often in July and August. Snow cover can persist from the end of October to mid-April, although in Rebiechowo snowfall was recorded on 8.08.1985. Most days with snow cover are in February and January. On average, there are 27 foggy days per year in Świbno and Rębiechowo, and 22 in Port Północny. Storms occur from May through August, 3-4 days each month.

This diversity of the geographical environment also affects the bioclimate, in which people with an efficient thermoregulatory system, easy adaptation, insensitive to sudden changes in weather feel good. There are about 40% of days per year that are troublesome for the body, due to strong winds, significant biological cooling and lower, compared to inland regions of Poland, perceptible temperatures. The area of Gdańsk (apart from the clear difference between the warmer autumn and the cooler spring, the high frequency of climatic comfort from June to August, with the maximum in August, and higher in autumn than in spring) is characterised by the minimal share of states of thermal sensations defined as "hot" and "warm", the low frequency of daily air temperature amplitudes ≥12°C favourable for the human organism, and the occurrence in August of the most favourable conditions for recreation, tourism and climatic treatment; the prevalence of one- and two-day comfortable weather situations.

Very high bioclimatic diversity refers to physiographic units. The least favourable conditions are found in the Gdańsk Upland, due to the lowest values of effective temperature and the lowest frequency of days with climatic comfort. It also has the highest air cooling magnitude values throughout the year and the lowest incidence of comfortable heat sensation. The Gdańsk Upland edge zone is characterized by values of bioclimatic indexes intermediate between those occurring on the upland and those recorded in the lower-lying districts. The frequency of daily air temperature amplitudes below 4°C is low here, and amplitudes ≥12°C are significant34.

8.14.1.1 Climate change

Computational climate models, using information about future changes in the atmosphere, are used to predict and show how the climate may change over the next 100 years (the average for the period 2071-2100 compared to the average for the period 1961-1990).

Climate models take into account the relationship between physical processes throughout the atmosphere–earth–water system and use emission scenarios developed by the Intergovernmental Panel on Climate Change (IPCC) and published in the Special Report on Emission Scenarios (SRES). They present different options for the amount of CO_2 and other emissions under the influence of socio–economic development.

A2 Scenario. Assumes development based on economic criteria, widening of the gap between poor and rich countries, rapid population growth, especially in developing countries, lack of commitment to environmental issues and technological progress weakest compared to other scenarios.

Scenario B1. It assumes a high level of ecological and social awareness, moving away from consumerist, purely economic attitudes towards sustainable development. Governments, business, media and people attach great importance to it. Conscious and intensive investment is made in technology, efficiency, ecology.

Scenario A1B (intermediate option). Assumes very rapid economic growth. The population grows until 2050 and then declines. New and effective technologies are rapidly being implemented. Increased economic cooperation and migration of people result in equalization of the level of civilization and income between regions of the world. This option assumes a balanced layout of energy systems, resulting from an even development of all forms of energy generation.

The projected changes in temperature and precipitation across the European Union region in the coming years developed under the A1B (optimal) and A2 (worst case) scenarios can be summarized in the following few key points:

- the increase in winter temperature is projected to be higher in north-eastern Europe (+2.5-3.0^{o}C in 2050) than in south-western Europe;
- winter temperatures could rise by 2.5 ^{o}C in southern Europe by 2050; rising temperatures will have adverse effects on most industries, the environment and society;
- average winter precipitation will increase over most of Europe; some countries in northern Europe may see an increase in precipitation of more than 25% in the 2050s; however, some southern European countries are

[34] *Source : www.gedanopedia.pl/*

more likely to see reductions in precipitation, with direct consequences for water users;

- overall, average summer precipitation is estimated to decrease over most of southern Europe, and in some countries precipitation could fall by as much as 50% in the 2050s. Combined with high summer temperatures, this can lead to an increased risk of water scarcity, particularly affecting water-intensive economic sectors.

However, it is important to note that climate models are constantly being improved, and uncertainties due to climate variability, the scale of the areas analysed, the scale of future greenhouse gas emissions, scientific knowledge of climate system components and internal interactions, lead to the use of different climate models. Consequently, there is a danger of presenting contradictory results regarding both the degree and rationale for predicted changes in climate parameters.

From a report published by the Helsinki Commission entitled: "Climate change in the Baltic Sea Area - HELCOM thematic assesment in 2013" shows that if appropriate measures are not taken, by the end of this century the average air temperature in the southern part of the Baltic Sea may increase by 3-5°C, while the Baltic water temperature by 2-4°C. A milder climate could reduce the ice cover in the Baltic Sea by 50-80%. In addition, changes in annual precipitation are projected: a 25-75% increase in winter precipitation and a 45% decrease in summer precipitation. Sea level will rise.

8.14.1.2 Assessment of the impact of current climate change on the ecosystem of the Polish Baltic coast and the coastal zone

Further description uses data from the study "Assessment of the impact of current and future climate change on the Polish coastal zone and the Baltic Sea ecosystem" (Institute of Meteorology and Water Management National Research Institute Maritime Branch in Gdynia, Gdynia, December 2014). The aim of the study was to identify existing climate changes in the coastal environment and to indicate which of them pose the greatest threat to the Polish coast. Air temperature, precipitation, sea level changes (including storm surges and coastal erosion issues) and temperature, ice, salinity and acidity of Baltic waters were analysed. The paper presents variability of selected climate elements in the Polish coastal zone in the second half of the 20th and the beginning of the 21st century and forecasts of climate changes.

Based on the analysis of meteorological elements covering the period of 1951÷2010, the following conclusions can be made.

<u>Variability of climatological conditions</u>

- The Coastal region, due to the influence of the Baltic Sea, is characterized by specific thermal conditions. On the Coast, winters (0.0°C) and autumns (9.0°C) are warmer than in the rest of the country, while springs (6.8°C) and summers (16.5°C) are cooler (average temperature for the 1951-2010 season is shown in parentheses).
- On the Polish coast, statistically significant changes occur for heat waves. Their annual number increases by less than 1 day per 10 years, and their total annual duration increases by 5 to 7 days per 10 years. This indicates a

systematic extension of periods with particularly high air temperature. The highest increase in warm days was calculated for the station in Szczecin.
- There is a downward trend in cold waves on the Coast, but the changes are not statistically significant.
- Mean annual precipitation totals for the period 1981-2010 indicate considerable variation in pluvial conditions along the Coast.
- There have been marked changes in mean sea level over the multiyear period 1951-2010. Both annually and seasonally, there was a clear, mostly statistically significant, increase in mean sea level. The average annual sea level on the Polish coast rose at a rate of about 2 cm per decade.
- The observed increase in storm surges (increase in number of storms and mean sea level) in the southern Baltic Sea over the past 25 years and the predicted changes indicate an increasing threat of these phenomena. A time shift in the occurrence of flood risk and an increase in the duration of risk is noted. The threat of stormwater flooding more than doubled in the late 20th century compared to mid-century. The lowest risk occurs on Hel, where the multi-year run of the annual index shows only a slightly increasing trend and quite low values.

In summary:

- there is a clear systematic increase in the frequency of hot days during the year, as a result of which the period with high air temperature systematically extends;
- there is a significant increase in average annual precipitation totals in the central part of the Coast;
- there is an increasing trend of changes in maximum annual sea levels with an increase in the duration of flood risk;
- systematic sea level rise and increased storm activity, especially during spring and winter, will affect the destruction of beaches and cliff shores, and may threaten tourist infrastructure (marinas, harbours, beach infrastructure, etc.).

<u>Icing of the Baltic Sea</u>

- In the Polish coastal zone, icing occurs only during moderate and severe winters, which do not occur very often. The Polish coastal zone is divided into several regions with different ice pattern: the area of bays: Pomerania and Gdańsk; floodplain area: Szczecin Lagoon and Vistula Lagoon; estuarial area of rivers and the area of open sea coasts. Ice phenomena in the open sea region are rare.
- A decrease in the number of days with ice on the Polish coast was observed in the multiannual period 1951-2008. The highest rate of decrease in the number of days with ice was recorded at the station in Świnoujście (about 6 days per 10 years).

In summary:

- on the Polish coast warmer and warmer winters are observed (with fewer and fewer days with ice), which contributes to greater economic activity, development of ports, shipping, fishing and maritime trade;
- less frequent severe winters are often preceded by a longer period of mild or moderate winters;

- the so-called “ice advance" observed during harsh winters causes damage to beaches and dunes, and even threatens residential buildings (Hel).

Change in physical conditions of seawater

- Changes in temperature and salinity of water in the sea are caused by natural factors such as air temperature, river inflow and atmospheric processes on different scales (e.g. circulation patterns over the straits and the Baltic Sea).
- The observed weak decreasing trend of pH in bottom waters of the order of -0.00001/year over the period 1980-2013 in the Polish Baltic Sea zone is in line with the ocean-wide trend of pH changes.
- In surface water, on the other hand, the trend of pH change was weakly positive at 0.00002 /year for the period under study, while it was weakly negative at -0.00003 /year for the decade 2004-2013.

In summary:

- rising sea temperatures will encourage the introduction of non-native species;
- a drop in salinity in the bottom layer of the Baltic Sea below 11 may lead to a lack of cod reproduction;
- an increase in water reaction (pH) leads to an imbalance in the uptake of calcium carbonate by photosynthetic organisms, which play a key role in ecosystem productivity.

Coastal dynamics of the southern Baltic Sea

- A significant threat is the increasing impact of hydrotechnical structures on shore abrasion due to the increase in intensity of hydrodynamic processes in the coastal zone.
- The analysis of changes of the Polish Baltic shore has shown an intensification of coastal erosion changes.
- Sea level rise averaged 10.6 cm/100 years.
- In recent decades, relative sea level rise has proceeded at a faster rate.
- There is an increasing threat of storm surges associated with a shift in atmospheric circulation to a more westerly direction, resulting in increased wind speeds.

8.14.1.3 Projected climate change

Observed and predicted changes in climate have a negative impact on the functioning of coastal zones in Poland, which usually hinders the maritime economy. In addition to the obvious impact of sea level rise, negative phenomena primarily include an increase in the frequency and intensity of extreme events (high winds, intense precipitation, storms, fog, etc.). For the Baltic Sea, this refers to a possible increase in the number, intensity and duration of storms.

Scenarios of changing meteorological conditions

- The scenarios indicate that the mean annual air temperature on the Polish coast during 2011-2030 will not change significantly from the mean values of the reference period 1971-1990. The temperature increase predicted for emission scenarios B1 and A1B will not exceed 0.1°C. Slightly larger changes may occur for the A2 scenario, for which cooling is expected relative to the reference period.

- Scenarios developed from the annual model indicate that annual precipitation totals for the period 2011-2030 for the B1 emissions scenario will increase slightly, but not more than 5%. For scenarios A1B and A2, the projected increase in precipitation totals will not exceed 3%.
- On an annual basis, the number of days with precipitation during the 2011-2030 period will be similar to the 1971-1990 reference period values. In the case of emission scenarios B1 and A1B there may be a slight increase in the number of days with precipitation on the Polish coast exceeding 2%. The results for the A2 scenario indicate that no noticeable changes are expected for this component.

Therefore, it can be concluded that the projected increase in mean annual temperature at the Polish coast is insignificant and should not exceed 0.1°C per year in the period 2011-2030.

Forecasted changes in thermohaline conditions

- The Baltic Sea (ICES 2010) is forecast to experience a decline in salinity of between 8% and up to 50% of its current value by 2100. The salinity of the surface layer in the Gulf of Gdańsk plays an important role in marine transport. With the increasing tonnage and draught of vessels entering Polish coastal ports and the decreasing salinity trend, an increase in the depth of the approach fairway to the ports of Gdynia and Gdańsk may be required in order to maintain the service of vessels already entering the port as well as new vessels with larger displacement and draught.
- The ranges and direction of projected changes in sea surface water temperature values are in agreement with the results of projections under climate change scenarios B1, A1B, and A2. The predicted temperature increase for the first two scenarios will not exceed +0.1°C, while a slight decrease is predicted for the last scenario.
- With a projected sea level rise of 0.3 m/100 years, significant changes will occur that threaten the safety of increasingly large sections of shoreline. The lowest bank destruction would be 0.6 m/year and the maximum would be 2 m/year.
- For an increase of 1.0 m/100 years, bank erosion is projected to increase to 0.32 m/year, and according to the results in the last surveyed decade, to 1.6 m/year in the western part and to 3.4 m/year in the eastern part.

Scenarios of changes in the occurrence of Baltic Sea ice

- The scenarios developed for the period 2011-2030 show that in the case of B1 scenarios a decrease in the number of days with ice of the order of 20% can be expected at all analysed measurement points, with the value of the change increasing slightly in the eastern direction.
- In the case of the A1B scenario, the scale of change is much more diverse, ranging from less than 2% in Hel to nearly 20% in Świnoujście and Gdynia.
- For the A2 emissions scenario, the number of days with ice is expected to increase along the entire coast, from about 11% in Świnoujście to over 30% in Ustka and Hel.

Scenarios of sea level changes along the Polish coast

- The scenarios developed for the period for 2011-2030 show that the average annual sea level over the period will rise by about 4-5 cm from the 1971-1990 reference period values.

- The scenarios developed for the period 2081-2100 show that annual mean sea level will rise from the 1971-1990 mean values depending on the scenario. The smallest increase is expected for the B1 issue scenario, but even in this case it will be about 20 cm. For the A1B emission scenario, the projected rise in mean sea level comes to about 25 cm, and for A2 it comes to about 28 cm.
- Changes in maximum sea level can be very large. Growth can range from about 25 cm (B1) to about 35 cm, and up to about 38 cm (A2) in the West Coast.

8.14.2 Vulnerability and impact of analysed options of the planned project on climate change

8.14.2.1 Assessment of project adaptation to climate change

This assessment adopts the **A1B scenario** presented in this section of the report.

The project adaptation assessment was based on the *"Guidebook for the preparation of investments taking into account climate change, their mitigation and adaptation to these changes and resilience to natural disasters"* (Ministry of Environment, Warsaw, 2015) - hereinafter referred to as *"Guidebook..."*.

8.14.2.1.1 Identify climate-sensitive investment areas/elements - sensitivity analysis

The primary and secondary risks associated with climate change were identified and a sensitivity analysis matrix for the planned project was prepared, with three degrees of sensitivity to the factor/threat identified:

- **High sensitivity:** Climate variable/threat can have a significant impact on assets and processes, outcomes, and transportation connections.
- **Medium sensitivity:** The climate variable/threat may have little impact on assets and processes, outcomes, and transportation connections.
- **Lack of sensitivity:** Climate variable/threat has no effect.

The table below lists the factors that were considered. Sensitivity was assessed in the context of key issues covering the main components of the value chain i.e. on-site assets and process, and outputs (users, revenues) and transport links.

Table 78 Sensitivity analysis matrix of the planned project to climate change factors/threats

		Main climatic factors/variables								Secondary/Secondary climate-related impacts/risks														
Type of enterprise	Sensitivity analysis area	Gradual increase in air temperature	Extreme temperature rise	Gradual changes in precipitation	Extreme rainfall	Average wind speed	Maximum wind speed	Humidity	Solar radiation	Sea level rise	Seawater temperature	Water availability	Storms	Flood	Ocean pH Index	Coastal erosion	Soil erosion/sandstorms	Soil salinity	Fire	Air quality	Ground/landslide/lawn instability	Urban heat island effect	Length of the growing season
Extension of the DCT Gdańsk Container Terminal in Port Północny in Gdańsk	On-site assets and process																						
	Outcomes (users, revenues), transport links																						

Sensitivity to climate change	NONE	MEDIUM	HIGH

High sensitivity – climate variable/threat can have a significant impact on assets and processes, outcomes, and transportation links.
Medium sensitivity – climate variable/threat may have a low impact on assets and processes, outcomes, and transportation links.
No sensitivity – climate variable/threat has no impact.

8.14.2.1.2 Assessment of project exposure/exposure to climate-related hazards

The exposure/exposure assessment was made on the basis of its geographical location, assuming climate change risks specific to the area, based on the *"Guidebook..."* cited above Ministry of Environment and ranked in three levels in the tables below.

Table 79: Exposure to climate change risks in the investment location (medium and high climate change sensitivity)

Threats associated with climate change	Exposure range
Extreme rise in air temperature	Heat waves and droughts can, in extreme situations, lower water levels and make navigation difficult or impossible
Extreme rainfall	In general, the amount of precipitation and its form (liquid or solid) do not pose a threat to the region. A daily precipitation totalling 150 mm is possible, with such a high intensity that 35-40 mm of rainfall is possible within 1 hour. Phenomena of this type, are characteristic for the warm season (May-October). Heavy snowfall is possible, forming a permanent snow cover of up to 50-60 cm in 24 hours. An increase in air temperature during the warm season can result in an increase in the frequency of hail precipitation as well as the size of hailstones. Not without importance is the possibility of freezing rain as a result of which it is possible to destroy overhead power lines, or their supporting structures. Modern climate change should favour an increase in the likelihood of heavy and heavy rainfall, but rainfall with the characteristics listed above will continue to be among the extremely rare, even unique. Likely, but not confirmed by climate model results, may be an increase in the incidence of cold season sediments such as glaze, much less rime.
Maximum wind speed	The area is heavily exposed to winds, especially those blowing from the west and northwest sectors. Because the project site is heavily transformed by humans, air flow is highly disrupted and wind tunneling (strengthening) as well as weakening effects may occur. The extent of these changes, however, should not be significantly greater than those observed elsewhere in the Tri-Cities. Progressive climate change is expected to manifest itself in an increase in both average wind speeds and more frequent high velocity winds. However, these changes will not be so strong that the anemological relations (i.e., those relating to wind characteristics) in the eastern part of the Polish coast will be such that the risks associated with them will exceed those currently experienced along the Dutch or German North Sea coast.
Relative sea level rise	Threats from both short- and long-term sea level changes will intensify over time as global warming intensifies. However, the magnitude of changes expected even by the end of the 21st century will not result in a significant increase in the threat to ship traffic on the waterway and quays
Storms	As a result of global climate change, the tropical zone is expanding northward, which causes more frequent inflow of hot tropical air to Poland. This air, colliding with cool air from the polar regions, intensifies storms and thunderstorms during the summer, which can result in disruptions to maritime transport as well.
Flood	Increased average wind speeds and more frequent high velocity winds, combined with sea level rise, can lead to more frequent storm events, sometimes resulting in flooding in coastal areas. In addition, the movement of watercraft along the waterway will be impeded during storm conditions.

Table 80: Assessment of the planned project's exposure/exposure to climate change factors/threats - current and projected

Degree of exposure	Climate change factor/risk
High	Extreme rainfall, maximum wind speeds, sea level rise, thunderstorms/storms.
Average	Extreme increase in air temperature, floods, sea water temperature
none	Gradual increase in air temperature, gradual change in precipitation, average wind speed, humidity, water availability, ocean pH index, coastal erosion, soil erosion, soil salinity, wildfires, air quality, land instability, urban heat island effect, growing season length

8.14.2.1.3 Assessment of project vulnerability to climate change risks

Based on the sensitivity and exposure analyses of the proposed project performed above, the table below identifies its level of vulnerability to climate change in the form of a matrix.

Table 81 Climate change vulnerability matrix for the planned project - current and projected

		Degree of exposure		
		none	**Average**	**High**
Sensitivity	**none**	• a gradual increase in air temperature, • gradual changes in precipitation, • average wind speed, • humidity, • solar radiation, • water availability, • ocean pH index, • coastal erosion, • soil erosion, • soil salinity, • fire, • air quality, • land instability, • urban heat island effect, • length of growing season.	-	-
	Average	• seawater temperature	• extreme increase in air temperature, • floods.	• sea level rise.
	High	-	-	• extreme rainfall, • maximum wind speed, • storms/sea storms,

Vulnerability to climate change	NONE	MEDIUM	HIGH

The above analysis shows that the proposed project has the greatest vulnerability to such climate change factors/threats as:

- sea level rise,
- extreme rainfall,
- maximum wind speed,
- storms/sea storms,

This is due to the location of the planned project in the maritime area, in the coastal zone, which is characterized by the occurrence of violent weather phenomena that may cause periodic difficulties in its implementation and operation and by the gradual rise in sea level associated with global warming.

8.14.2.1.4 Risk assessment of climate change risks

Based on the analysis of the vulnerability of the planned project to climate change factors/threats, the following is an assessment of the risk of climate change and its impact on the investment in context:

- destruction of fixed assets/assets/engineering/operational aspects,
- safety and health,
- environment,
- social,
- reputation/opinion.

The assessment of climate change impacts on the above mentioned issues was done based on a 5-point scale, according to the guidelines of the Ministry of Environment included in the *"Guidebook..."* - Table below.

Table 82: Assessment of impacts/consequences for different risk areas

Affects:	**Scale of climate change effects/impacts**				
	1	**2**	**3**	**4**	**5**
	Irrelevant	**Mild**	**Moderate**	**High**	**Drastic/catastrophic, natural disaster**
Destruction of fixed assets/assets/engineering/operational aspects	Impacts can be mitigated through standard activities	An adverse event that can be mitigated by maintaining continuity of operations	Serious event that requires additional intervention with continuity of operations	Critical/significant event that requires intervention/emergency action, with continuity of operations	A disaster potentially leading to the closure or destruction of a fixed asset/asset/network element
Safety and health	Cases requiring first aid	A minor injury, a case requiring medical treatment, or a case resulting in limited ability to work	Serious injury or accident resulting in inability to work	Extensive injury or multiple injuries, permanent injury or disability	Fatality or fatalities

Affects:	Scale of climate change effects/impacts				
	1	2	3	4	5
	Irrelevant	**Mild**	**Moderate**	**High**	**Drastic/catastrophic, natural disaster**
Natural environment	No impact on reference environmental condition. Impact limited to source area. Corrective actions not required	Impacts of effects within the project site boundaries. Corrective actions conducted for 1 month after the occurrence impact	Moderate damage with potentially more extensive effects. Corrective actions carried out for 1 year	Significant damage with locally visible effects. Corrective actions conducted for more than 1 year. Exceeding regulations, standards or requirements set forth in environmental permits	Significant damage with widespread effects. Corrective actions conducted for more than 1 year. Limited opportunity full revitalization/restoration of environmental functions and quality
Social	No impact on society	Local, temporary effects on the public	Local long-term effects on the public	Lack of protection for poor or vulnerable groups. Long-term effects on society nationwide	Loss of social consent to operate. Protests from the community
Reputation/opinion	Local, temporary impact on public opinion	Local, short-term impact on public opinion	Local, long-term influence on public opinion, unfavorable reports in local media	Short-term impact on public opinion across the country; negative reports in the national media	Long-term effects across the country, with the potential to affect government stability

The risk assessment was performed in the form of a matrix, representing the probability of climate impacts on the planned project with the scale of climate change related effects/impacts identified above. The probability of an event during the construction and operation period of the project was based on a 5-point scale, shown in the Table below.

Table 83: Scale for assessing the likelihood of an impact

Probability of climate change risk				
1	2	3	4	5
Highly Unlikely	Unlikely	Moderately likely	Likely	Almost certain
Very low probability of occurrence	In the context of current practices and procedures, the event is unlikely to occur	An event with a similar profile/under similar circumstances has already occurred in the country	There is a high probability that the event will occur	There is a very high probability that the event will occur, the event may occur several times
5% probability of event occurrence per year	20% probability of event occurrence per year	50% probability of event occurrence per year	80% probability of event occurrence per year	95% probability of event occurrence per year

The risk matrix for the planned project developed based on the above data is presented in the Table below.

Table 84: Risk matrix

Affects:	Scale of effects/impacts of climate change on the project				
	1	2	3	4	5
	Irrelevant	Mild	Moderate	High	Drastic/catastrophic, natural disaster
Destruction of fixed assets/assets/engineering aspects/operational aspects	A, B, C, D	A, B, D	B, D	B, D	B, D
Safety and health	A, B, D	B, D	B, D	B, D	B, D
Natural environment	A, B, D	B, D	B, D		
Social	A, B, C, D	B, D			
Reputation/opinion	B, D	B, D			

Explanations:

- Colours indicate the probability of a given effect occurring.
- Letters indicate the factor/threat for which the Project has the highest susceptibility and causing the given effect (for probability of ≥20%):
  - A - extreme rainfall
  - B - maximum wind speed
  - C - sea level rise
  - D - storms

As a result of the risk assessment for the planned investment related to climate change, it can be concluded that the highest probability is characterized by events with insignificant impact on issues mainly related to the environment and social factors. In contrast, hazards that could result in large and drastic impacts on a project that could significantly impede its construction or operation are characterized as very low probability.

Risks for climate change factors/threats for which the planned project has the highest vulnerability during its implementation i.e:

- extreme rainfall,
- maximum wind speed,
- storms/sea storms,

can be estimated at most as medium, not jeopardizing its feasibility and requiring only additional interventions, with continuity of activities. Intervention activities will primarily include securing the construction site and construction equipment in the event of warnings of possible extreme weather events and repairing any damage after the warnings have passed.

During operation, factors that may affect its durability and hinder its use are primarily maximum wind speeds, extreme ice and storms/sea storms, which may cause damage to the berths and their equipment (bollards, fenders, lighthouses), shallowing of the fairway, disruption of ship traffic or temporary shutdowns. However, the risks associated with these changes can be described as medium at best, not jeopardizing its feasibility and requiring only additional intervention measures (repair of damage to quays and replenishment of their equipment, sub-cleaning works of the fairway).

No adverse climate or climate impacts to the project are anticipated. The project is not significantly impacted by climate change or the risk of damage from extreme weather events. On the other hand, it is adapted to work in variable weather conditions (heavy rainfall, storms, etc.), which will largely eliminate the risk of damage.

8.14.2.2 Identify and evaluate adaptation options

The resistance of the project to climatic phenomena was ensured by using a heavy-type quay structure to withstand the movement of ice floes. The durability of the structure will be ensured by steel sheet pile walls, combination walls with high strength index and their anchoring. In addition, high strength class frost and waterproof concrete caps are provided. It is planned to dredge the basin at the quays, which will help avoid ice accumulation in case of unfavourable winds. Periodic scour/dredging work will allow larger icebreakers to operate, which, as a result of the icing of the waterway, will allow a permanent trough to be maintained and also eliminates the effect of shallowing the waterway for navigation.

Site and waterfront drainage parameters take into account the occurrence of extreme rainfall events, preventing local flooding. The design of the waterfront crest ordinate will take into account the effect of global warming and increase the design water level by the projected sea level rise as recommended by the IPCC.

Organizational activities during implementation and operation of the planned project will be:

- planning a work schedule appropriate to coastal weather conditions,
- compliance with port regulations,
- continuous monitoring of the Regional System of Warnings concerning the possibility of extreme weather conditions and floods and information on navigation provided by the Gdańsk Harbour Master's Office,
- the functioning of the Rescue Centre within the Port of Gdańsk which fulfils the function of the Coordination and Rescue Centre bringing together all the services aimed at maintaining safety in the port.

The remaining climate risks to which the Project demonstrates lack of vulnerability do not require adaptation measures to ensure its resilience to climate change.

8.14.3 Impact of the planned project on the climate

The project will not have a significant impact on global climate change. The main source of greenhouse gas emissions will be the combustion of fuels (diesel) in the engines of means of transport and working machinery and vessels during the implementation and operation of the planned investment.

The basic principle limiting the emission of greenhouse gases and thus reducing the impact of the planned investment on the climate will be the use of technically efficient machinery, equipment and vehicles with current technical inspections and the rational use of fuels (diesel oil). These actions can have the effect of reducing emissions and thus can minimize the project's impact on climate change. As part of the planned project, in order to reduce emissions of, among other things, greenhouse gases, it is planned to install electricity-powered overhead cranes and to construct electrical connections at the quays.

The emissions associated with the construction and operation of the – terminal will be negligible in the context of global warming and climate change.

9 Environmental impacts in emergency situations, including major industrial accidents and other hazards, including natural or construction disasters

9.1 Types of emergency events and other hazards

In the course of construction or operation of the DCT terminal, the following situations may occur which have the nature of an accident or other hazard with possible negative effects on the environment:

- fires, explosions and associated emissions, and the impact of fire effluent on water bodies,
- spills to soil and water / air emissions of chemicals,
- failure of equipment to protect or reduce the discharge of pollutants to the environment,
- disruptions to water, electricity, gas and other utilities,
- hazards associated with the surrounding flora and fauna,
- other uncontrolled releases of energy and substances.

These incidents may be the result of a collision between a vessel and a quay or a vessel and a vessel, they may be caused by the impact of a container as a result of the above or other incidents - in which case fuel or the contents of the containers may leak, the quay may also be damaged, in extreme cases the crane may be damaged/turned over, etc.

Events that may result in a fire can also be caused by the work of subcontractors, such as improperly performing fire hazardous work.

Flooding is also a natural hazard that could threaten the terminal, and during the construction phase a special hazard is posed by the potential presence of military explosives on or under the seabed.

The terminal is not subject to major accident regulations because hazardous substances that are stored at the terminal are here in a transport mode and are subject to regulations related to the movement of hazardous materials by water, road and rail (IMDG, ADR, RID).

Procedures and instructions as well as other internal documents describing how to prevent accidents, prepare for possible accidents and respond to accidents are elements of the site's management - also as part of the environmental management system compliant with the requirements of Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organizations in a Community eco-management and audit scheme (EMAS). Therefore, they are subject to periodic internal and external audits and the general principle of continuous improvement, which means that they are subject to modification, adaptation to needs, increasing their characteristics, effectiveness and practicality.

9.2 Construction phase

During the expansion of the DCT Terminal, the main sources of malfunctions and accidents and the resulting hazards may be the work of vessels dredging the basin of Port Północny and dredging the excavated material in order to flood the terminal piers.

Emergency events associated with operation of vessels can lead to water pollution from small spills of petroleum (fuels). The Port Północny has adequate equipment including, but not limited to, a spill catcher, floating dams, and sorbents to remove oil from port areas (discussed in the Operations section).

Within land or flooded areas, possible minor accidents and minor releases of various types of substances will not affect the environment. Construction contractors should be equipped to deal with minor emergency events of this nature.

9.3 Operation phase

During the operation phase of the Terminal resulting from the Project, various types of accidents and associated emergencies may occur involving the following modes of transportation: ships, cranes, tractors, cars and - outside the Project area - railcars. For the most part, they will not, other than endangering the health and lives of service workers, cause environmental hazards.

Ship (container ship) - Terminal quay collisions may be the most serious, due to technical consequences. In these types of cases, it is extremely rare for any environmental impact to occur. When containers are handled from ship to quay or vice versa, when they are stacked on storage yards or mounted on tractors or railroad platforms, a collision can occur in which the individual container and the handling equipment or the means of transport are severely damaged. Such failures will consist of mechanical damage without causing any environmental hazards. In the event that the container will contain hazardous cargoes, a variety of toxic, flammable, explosive, corrosive, etc. substances and materials may be damaged in the event of an unsealing. The risk of such an event is minimal as the percentage of containers with hazardous cargo is small. Containers with hazardous cargo will be stored in a designated area in accordance with the rules adopted for the transportation of containers with hazardous cargo, the terminal will be equipped with tractors with a drip tray for dripping containers. If a spill is found, the container will be placed in a sump - the collected leachate will be treated as waste and will be transferred to authorized entities for treatment or disposal.

Generally, a container terminal is designed for the handling of containerized goods between ship land and vice versa. The basic assortment consists of non-flammable or hardly-flammable materials transported in containers, i.e. non-flammable packaging. Storage is organized as blocks separated by traffic lanes. Such an organization and assortment makes it possible to exclude a major emergency or fire hazard. Fire protection of the terminal will be implemented based on:

- technical solutions of facilities meeting the requirements of fire protection regulations, including fire roads in yards,
- a hydrant network providing the required amount of water for firefighting purposes,
- detection facilities and relaying threat information to duty points,
- trained and familiarized with fire protection issues crew,
- cooperation with Port Fire Brigade "Florian" in the field of rescue and duty during handling hazardous materials.

Handling of containers of hazardous substances will be handled using the rules and regulations for handling resulting from:

- the International Convention for the Safety of Life at Sea (SOLAS) adopted on November 1, 1974 by the International Conference for the Safety of Life at Sea (International Maritime Dangerous Goods Code - IMDG),
- the international convention, drawn up in Geneva on 30 September 1957, on the carriage of dangerous goods and loads by road (ADR),
- convention of 9.05.1980 on International Carriage by Rail (COTIF) (Regulations concerning the International Carriage of Dangerous Goods by Rail) (RID).

Adequate preparation for emergencies, including fire, will lead to a reduction in the magnitude and extent of emissions resulting from an emergency event.

The new areas covered by DCT's activities will also be covered by the environmental management system implemented in DCT, positively verified for compliance with the EMAS requirements[35]. The above-mentioned emergency management is covered by this system and regulated, among others, **by the procedure**:

- DCT/SOP/SC/47.xx "Emergency Preparedness and Response to Environmental and Energy Emergencies," which establishes principles for identifying potential emergencies, procedures for planning, conducting, and documenting emergency response and recovery from emergencies. According to this procedure, identification of potential emergencies applies to all facilities and processes (including investment activities); includes:
    - fires, explosions and associated emissions, and the impact of fire effluent on water bodies,
    - spills to soil and water / air emissions of chemicals,
    - failure of equipment to protect or reduce the discharge of pollutants to the environment,
    - disruptions to water, electricity, gas and other utilities,
    - hazards associated with the surrounding flora and fauna,
    - other uncontrolled releases of energy and substances;

and related **procedures**:

- DCT/SOP/SC/46.xx Procedure for environmental operational control, monitoring and measurement;
- DCT/DOC/SC/26.xx Fire Protection Plan;
- DCT/DOC/SC/61.xx Employees designated for fire fighting and evacuation;
- DCT/DOC/SC/62.xx Employees designated to provide first aid;
- DCT/SOP/SC/17.xx Procedure for subcontractors and service companies;
- DCT/SOP/SC/23.xx Supervision of subcontractors
- DCT/SOP/SC/25.xx Fire Hazardous Work Procedure;
- DCT/SOP/SC/35.xx Post-accident investigation for an accident at work;
- DCT/SOP/OPS/1.11 Handling of IMDG dangerous cargo;

and **instructions**:

- Safety instructions for semi-trailers
- Operating instructions for the liquid waste sump
- DCT/DOC/SC/88.xx Instruction for on-site storage
- Safety Instructions for Handling Containers with Explosives - Class 1 of IMDG Code in DCT Gdańsk

[35] EMAS EcoManagement and Audit Scheme) is an EU environmental certification scheme that operates on the basis of Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS).

The detailed principles of the Port of Gdańsk security system which covers the DCT terminal and the principles of handling containers with hazardous substances which are subject to special internal regulations are discussed in separate subchapters below.

9.3.1 Handling containers with hazardous substances

Detailed issues of handling containers containing hazardous materials are regulated by internal procedure "**DCT/SOP/OPS/1.11 Handling of IMDG Dangerous Goods".** This procedure is presented in its entirety in **Appendix 9-1**.

Furthermore, DCT is obliged to comply with the requirements arising from *Order No. 4 of the Director of Maritime Office in Gdynia dated August 7, 2000 on preventing the occurrence and spreading of fire, natural disaster or other local hazard in the area of maritime ports and harbours lying within the territorial jurisdiction of the Director of Maritime Office in Gdynia* (Dz. Urz. Woj. Pomorskiego No. 108, item 705, Dz. Urz. Woj. Warmińsko - Mazurskiego No. 50, item 657, as amended). Direct requirements resulting directly from this act for several types of potentially hazardous situations are presented below and are recognized in the TPD and adopted for use - some of which are reflected in the aforementioned procedure. Thus, for example, Chapter IV of the Ordinance addresses fire protection in the transportation, storage, and handling of hazardous materials and provides, among other things, as follows:

> *"Article 8. Hazardous materials otherwise known as dangerous goods or dangerous cargo are:*
> *1) substances and objects classified in the IMDG Code,*
> *2) substances listed in the IBC Code,*
> *3) gases listed in the IGC Code,*
> *4) substances listed in MARPOL 73/78:*
> *- "oils" as listed in Annex 1 of MARPOL 73/78,*
> *- liquid harmful substances as listed in Annex 2 of MARPOL 73/78,*
> *- harmful substances listed in Annex 3 of MARPOL 73/78 and in addition substances and objects not listed above but:*
> *- declared as hazardous in the shipping documents,*
> *- labelled as hazardous on packaging,*
> *- contained in packages whose appearance indicates the hazardous nature of the contents.*
> *§ 9. Hazardous Materials Storage.*
> *1. The storage of hazardous materials in the port area should be done in accordance with the site plan and the technology manual. These documents are subject to agreement with the Director of the Maritime Authority.*
> *2. Any change in the use of a structure or site or part thereof shall require the approval of the Director of the Maritime Authority.*
> *§ 10. All activities associated with transport or storage of hazardous materials must be carried out in accordance with the regulations on fire protection and environmental protection specified in the technological manual and in accordance with the manufacturer's instructions.*
> *§ 11. When a vessel with hazardous materials is at berth in the port, fire supervision in accordance with the technological manual or appropriately extended if deemed necessary by the harbour master. (...)*
> *§ 13. 1. Handling stations for hazardous materials emitting flammable gases should be equipped with:*
> *1) gas detection devices,*
> *2) fixed firefighting equipment,*
> *3) means of telephone and radio communication and acoustic and optical alarm signalling.*
> *2. In the absence of fixed fire-fighting equipment and when it does not cover the entire berth, including the ship, the method of fire protection is specified by the Terminal Technology Instruction."*

Chapter V, in turn, deals with the bunkering of a vessel with liquid fuel and provides, among other things, as follows:

> *"Article 14. 1. During bunkering at the quay, it is prohibited to carry out fire hazardous work on the vessel and to perform reloading operations that pose a fire hazard.*
> *2. Bunkering of oil tankers carrying petroleum liquids, chemical liquids or liquefied gases in bulk or ungassed after their carriage as cargo takes place only under the conditions specified by the harbour master*

§ 15. The following arrangements are to be observed during bunkering of propellants, oils and lubricants, in the bunker/auto-tanker-ship relationship, as well as during collection of used oils, oily waters, etc. from the ship:

1) In organizational terms:

a) report the planned operation well in advance to the Duty Officer of the Port Captain's Office and obtain approval of the time and place of the operation,

b) establish a communication system between the car/bunker and the vessel and the Port Fire Department,

c) when bunkering flammable liquids, all fire-hazardous work (e.g. cutting, welding, etc.) shall be stopped on the vessel and in the loading area,

d) ensure continuous supervision of bunkering by the supplier and the recipient,

e) agree on the rate of filling the tanks (tanker truck pump capacity) during bunkering;

2) in fire protection scope:

a) ground the tank car,

b) display hand-held firefighting equipment (on board in accordance with the Ship's Manual, at the tanker truck a powder or snow extinguisher and a fire blanket),

c) display "Smoking Prohibited" warning signs and a "B" flag (red light at night) on the vessel,

3) With regard to environmental protection in the bunkering of fuel of any quantity, ships should comply with the provisions of the Helsinki Convention 92 (Dz. U. of 2000 No. 28 item 346, 347) and MARPOL 73/78 Convention, in addition:

a) protect storm drains from possible product entry, in the event of a spill,

b) protect hose connections (valves) with a tub of at least 50 liters capacity - in case of a spill as well as prepare sorbents to liquidate the spill,

c) keep a constant check on the tightness of the docking hose connections,

d) prepare means on board to clean up minor spills,

e) protect scuppers from possible product release in the event of a spill on deck.

§ 16. A permit must be obtained for bunkering of fuel by vessels in the marine waters of the Republic of Poland:

a) the harbour master, when operations are carried out in port waters and roadsteads,

b) the Director of Maritime Office in case of operations on internal sea waters and territorial sea, excluding waters referred to in (a). (...)

§ 19. In the event of an oil/chemical spill, please:

a) stop the reloading,

b) notify the crew and proceed to eliminate the hazard,

c) notify the harbour master by the nearest available means of communication, who will take the necessary action in accordance with the procedures in force."

Chapter VI of the Ordinance addresses the intra-port movement of vehicles transporting hazardous materials and provides, among other things, as follows:

"Article 20. 1. Motor vehicles used at the Port for the transportation of hazardous materials should comply with the requirements of the applicable regulations on the carriage of hazardous materials by road.

2. A motor vehicle carrying particularly hazardous materials in the harbour shall be piloted by a vehicle marked in accordance with the Highway Code. No more than one trailer may be attached to a motor vehicle.

3. Vehicles travelling in the same direction shall not approach a vehicle carrying hazardous materials for a distance of less than 30 m.

4. Speeding is not permitted in the harbour or on intra-port roads and plazas:

a) fleet vehicle - 15 km/h,

b) railroad wagons - 5 km/h,

c) other means of transport - 10 km/h."

The figures below present three process maps showing DCT's systems approach to emergency prevention and response preparedness.

Mapa procesu – wycieki płynów z kontenerów

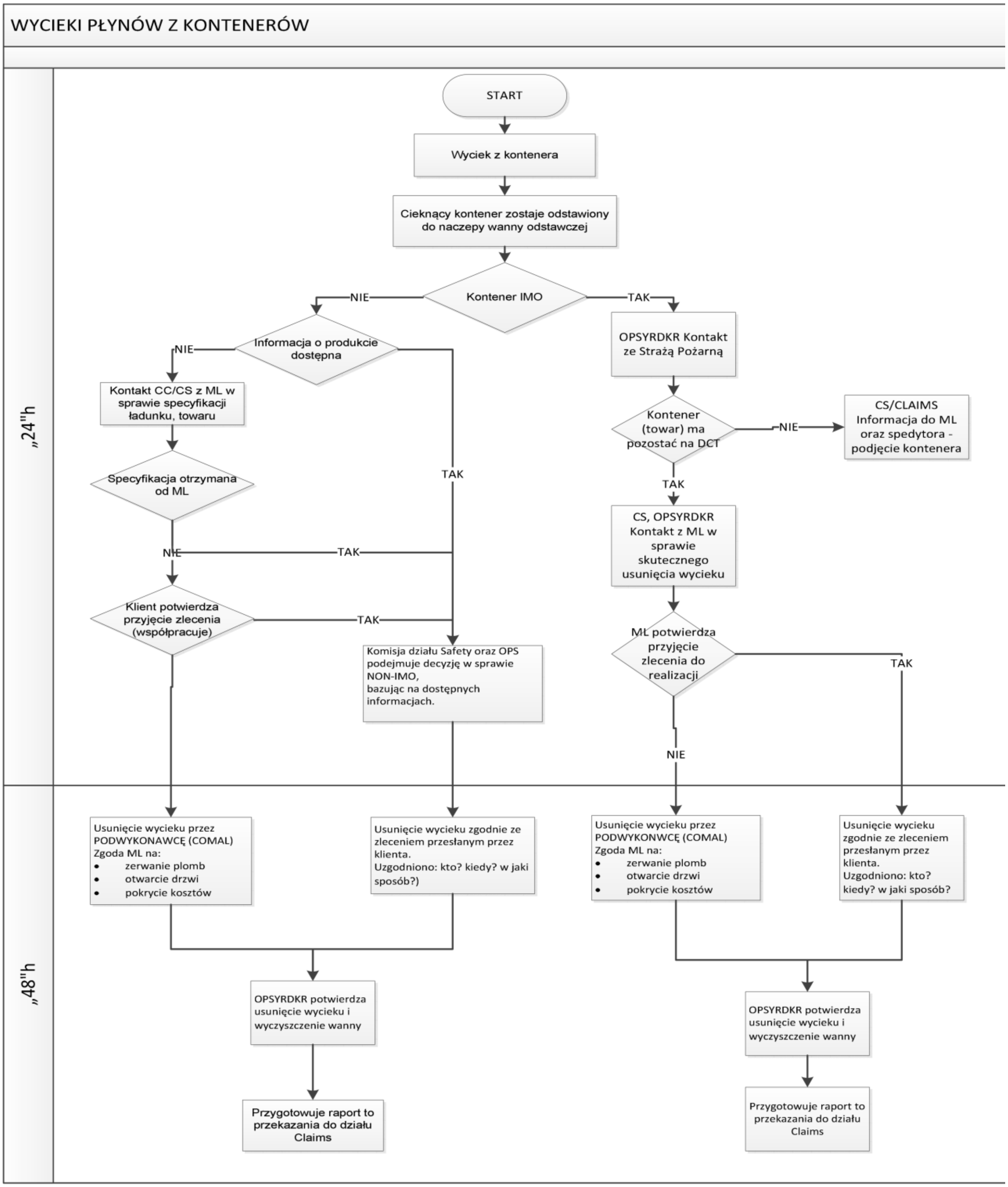

Figure 112: Process map - spills of liquids from containers

Mapa procesu obsługi kontenera w przypadku stwierdzenia wycieku płynów – Brama wjazdowa (dla celów poglądowych)

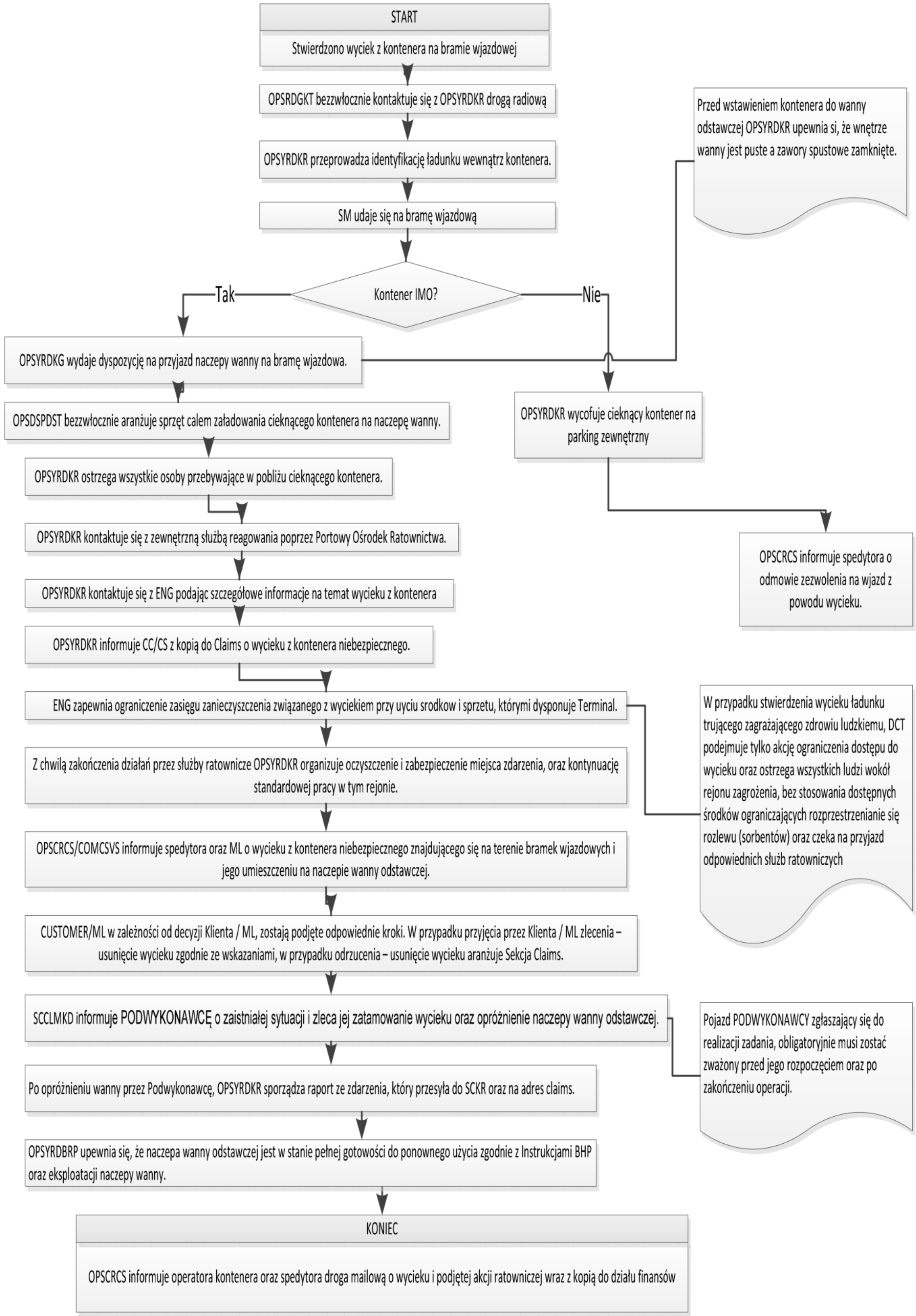

Figure 113: Map of container handling process in case of liquid leakage - Entrance gate (for reference)

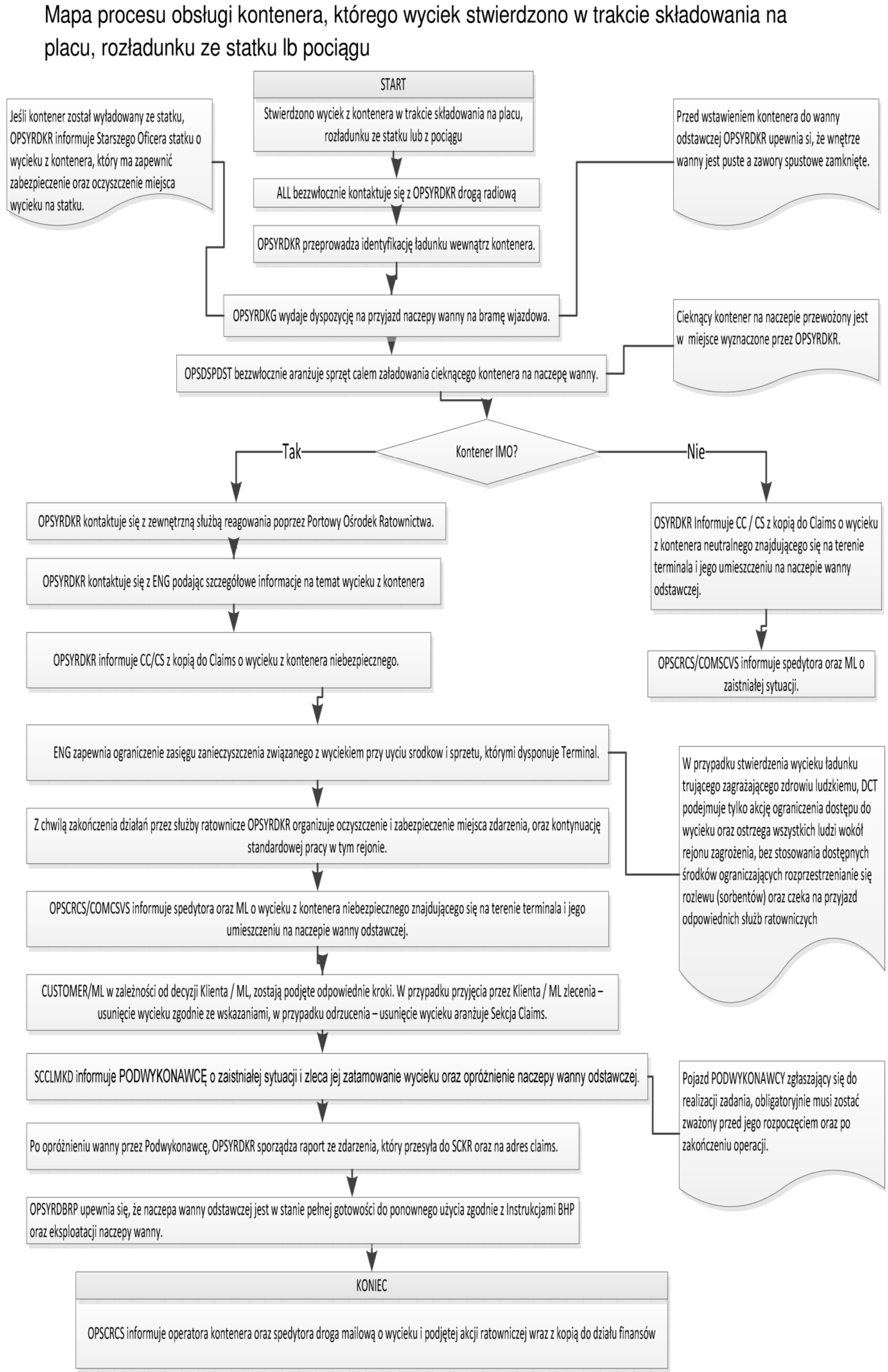

Figure 114: Process map for handling a container found to be leaking during yard storage, unloading from a vessel or train

9.3.2 Maritime Incident Prevention and Response Preparedness

The Port of Gdańsk operates, as an element of the national system, a system for combating threats and pollution at sea, the detailed organization of which on a national scale is defined by the Regulation of the Council of Ministers of 8 August 2017 on the manner of organization of combating threats and pollution at sea (Dz.U. 2017, item 1631). In the Port of Gdańsk all activities related to counteracting hazards and pollution in the Port are conducted on the basis of ***"The Plan for Combating Hazards and Pollution in Port Waters Managed by the Port of Gdańsk Authority S.A."*** approved by the Director of the Maritime Office in Gdynia with the decision no. 8201/5/04 dated 02.12.2004. The plan was updated in April 2012 and approved by the Director of Maritime Office in Gdynia with the decision no. 076/46/12 dated 22.06.2012.

DCT has a port-wide plan ***"Plan for Combating Hazards and Pollution of Water in the Port Basin (DCT/DOC/SC/27.04)".*** This plan is presented in its entirety in **Appendix 9-2**. This plan is a kind of extension of the "Plan for combating hazards and pollution in port waters managed by the Port of Gdańsk Authority SA" to the water areas in the DCT area. It references the same resources and the same general operating procedures as the Port's existing plan. It benefits from the fact that there are two specialized services at the Port of Gdańsk, which are properly competent and equipped to respond to any reported irregularities. These services are the Port Fire Brigade "FLORIAN" Sp. z o.o. and the Port of Gdansk Security Guard Sp. z o.o. In addition, DCT refers in this procedure to the resources of the State Fire Service in Gdańsk (in the area of operation of JRG-2 Gdańsk Śródmieście) and the Maritime Search and Rescue Service (SAR).

Activities to combat hazards and pollution in port waters consist of:

- threat assessment and monitoring,
- spill reduction,
- mechanical dirt collection,
- neutralize or disperse the contamination.

Currently, the only preferred methods for removing oil pollution in marine waters are mechanical collection or the use of sorbents. The use of chemical dispersants is allowed only in rare situations where the above methods are ineffective or inapplicable and where leaving an oil film on the water will cause more environmental damage than using chemicals. However, such proceedings require in each individual case the consent of the Director of the Maritime Office in Gdynia.

9.4 Flood risk

On the basis of the flood hazard maps and flood risk maps made available by the National Water Management Authority and derived from the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, it can be concluded that the project area is not located in a flood risk zone, as the maximum predicted sea level in this area, with reference to flood situation with probability of 0.2%, is estimated at 2.5 m, and the terminal pier grade is 3.0 m and has been determined at this level also due to long-term predictions of sea level and storm surges.

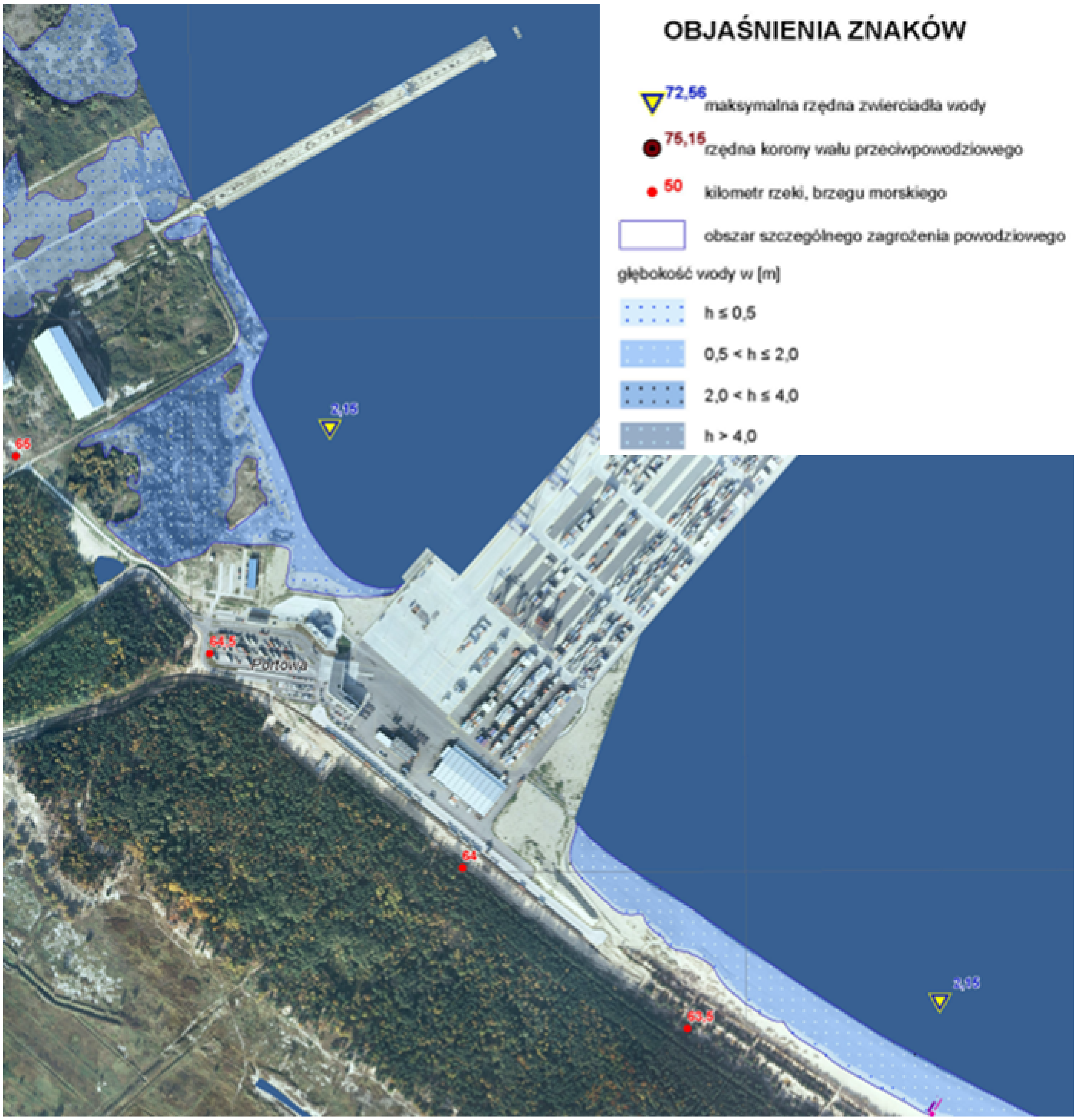

Figure 115: Seaward flood hazard map, including internal marine waters. Areas where flood probability is moderate and occurs once every 100 years (Q 1%). Gdańsk – Port Północny, N–34–50–C–d–2

[Source: kzgw.gov.pl] [The maps were created in 2014-2015 - so the T 2 terminal is not shown on them]

Figure 116: Seaward flood hazard map, including internal marine waters. Areas where flood probability is low and occurs once every 500 years (Q 0.2%). Gdańsk – Port Północny, N–34–50–C–d–2

[Source: kzgw.gov.pl] [The maps were created in 2014-2015 - so the T 2 terminal is not shown on them]

9.5 Other hazards

In 2012, a study related to several site alternatives for the then-planned construction of Terminal T 2 was performed, titled "Evaluation of Site Hazard with Respect to Military Explosive Objects". "Site hazard assessment in terms of depositing explosive objects of military origin". The expert opinion was performed by Eng. Piotr Bik (sworn expert of the National Chamber of Maritime Economy in the field of: explosives, detection and neutralization of unexploded ordnance and explosive objects - reg. no. 0075 KIGM; court expert at the District Court in Gdańsk in the field of: explosives, detection and neutralization of unexploded ordnance and explosive objects - decision no. Adm. 0142 - 178 / 05; authorized by WITU No. 107/2009 to supervise and conduct work in the field of clearing land of explosives, including their destruction with explosives intended for civilian use). On the basis of the results of archival research and on the basis of the analysis of historical information about the hostilities and the military purpose of the area covered by the expertise, in particular the course of hostilities in the spring of 1945 and the statement that, for example, "on March 31, 1945, the front line ran exactly through the areas covered by the expertise", a conclusion was formulated that "the area of the DCT Gdańsk S.A. terminal may be threatened to a very high degree by the occurrence of unexploded artillery shells, aerial bombs, mines and anti-tank round, ammunition left in the form of individual grenades and shells, as well as entire ammunition depots'. Given that after 1945, "there was no comprehensive cleanup of the marine basin as well as the coastal land areas. Ad hoc interventions by police or military sapper patrols have not significantly reduced the threat of unexploded ordnance. This entire area should therefore be considered potentially at risk for the presence of military explosive items." In addition, the study stated that the marine area, "i.e., the ship berths and the approach fairway, were not rescanned after dredging, and therefore cannot be assessed as free of explosive objects of military origin. During the dredging works, 20 pieces of unexploded caliber artillery shells were excavated from this area. 75 - 210 mm, indicating an existing hazard. The action of ocean currents, sea surges, and slope slip may have moved explosive objects to the deepest places. Under extremely adverse circumstances, large explosive objects drifting on the bottom, i.e. sea mines, deep-sea bombs or torpedoes, could have been displaced."

In view of the above, a recommendation related to the maritime area was made that "the maritime area of DCT Gdańsk S.A. should be considered as potentially threatened by the presence of military explosive objects.

It is recommended that the marine area of the DCT be scanned and cleaned if possible. Water area cleaning technology:

a) GPS determination of the body of water to be checked and cleaned,
b) scanning with magnetometers on vessels of the body of water to be cleaned,
c) making a list of metallic objects including explosives, indicating their location,
d) marking of areas where metal objects are deposited (successively as the work progresses),
e) purging (using water or air) of detected objects,
f) identification of excavated metal objects,
g) hazard assessment of unearthed explosive objects,
h) extraction of non-hazardous items on the vessel,
i) the extraction on a vessel of explosive objects weighing not more than 50 kg,
j) marking of explosive objects of significant weight (torpedoes, naval mines, aerial bombs) for transfer to the Navy for transport and disposal on the naval training ground,
k) transportation ashore of the excavated munitions (for small-sized items),
l) the deposit of explosive items in a field storage facility for unexploded ordnance,

m) handing over explosive objects to military sapper patrol for disposal on military training grounds or destruction in a place indicated by the Pomorskie Voivode".

There is no doubt that a similar approach should be adopted for the floodplain and the offshore dredging area of the DCT expansion that is the subject of this report.

10 Comparison of the technology used with the technology complying with the requirements of Article 143 of the Environmental Protection Act

Technologies used in newly commissioned or substantially modified plants shall meet, among other requirements:

- use of substances with low hazard potential,
- efficient use of energy,
- ensure rational use of water, raw materials, materials and fuels,
- use of low- and zero-waste technologies and waste recovery,
- limits on the size and scope of emissions,
- using comparable processes and methods effectively applied on an industrial scale,
- scientific and technological progress.

Already at this early stage of project planning, it was ensured that the aforementioned requirements would be met - with respect to the construction and operation phases of Terminal T3.

The terminal structure must be constructed of materials that are neutral to seawater or the subsoil, as only neutrality ensures that the structure is subjected to minimal erosive or corrosive attack. Consequently, whether it is the material from which the piles will be constructed or the materials from which the quay, storage yards, etc. will be constructed will be based on environmentally neutral substances and therefore of low hazard potential.

Efficient use of energy, rational use of water, raw materials, materials and fuels and the resulting reduction in the volume and range of emissions, among other things, is an element of not only environmental, but above all economic analyses. In this context, it should be pointed out that the very layout of the storage yards at the terminal is planned in such a way as to - given the shape of the plot, location of the entrance-exit and the railroad siding - minimize the distance travelled by all types of vehicles to move containers over the shortest possible distances. This has an impact on the reloading time, which is directly related to high costs (e.g. resulting from the ship's lay-time), as well as on fuel and energy consumption, which constitute a very important component of the terminal's operating costs and are systematically minimized. Minimizing the distance of movement of equipment has a direct impact on reducing fuel and energy consumption, emissions (dust and gas and noise).

Also of significance in terms of emissions is that T3 will be equipped with overhead cranes that will be powered directly by grid-supplied electricity to the equipment, rather than generated through a diesel-powered generator located on the crane. The use of these devices will reduce dust and gas emissions as well as result in less noise emissions to the environment.

One of the actions aimed at reducing emissions will be the readiness to use a new technology for supplying energy to moored ships called *cold ironing* (other terms: shore power systems, *alternative maritime power (AMP)* or *shore* power). A vessel in port will be able to be powered by electricity instead of generating electricity for its own use while in port from diesel-powered captive electricity generators. Ships which are adapted to this type of technology and which will take advantage of such a possibility in DCT will be powered in this way.

Tractor-trailers (or other vehicles) that could run on CNG, LPG, or other fuels instead of diesel are also being considered as an option.

Rainwater will be retained within the terminal area as much as possible, while the runoff from sealed surfaces, before being discharged into the receiver, will be subjected to treatment as regards mineral suspended solids and oil derivative contaminants in highly efficient pre-treatment devices - separators.

It should be emphasized that DCT Gdańsk S.A. promotes environmentally friendly intermodal transport, indicating sea and rail transport as the most functional forms of intermodality. DCT Gdańsk S.A., by undertaking this project, fully contributes to the development of the trans-European combined transport network by promoting low emission modes of transport while increasing the efficiency of the infrastructure and the interoperability of green corridors.

Finally, the DCT container terminal is registered under EMAS, which is an additional guarantee of due diligence in the field of environmental protection, which is the subject of regular actions in accordance with established procedures, as well as being the subject of both internal and external audits (at DCT the EMAS verifier is Bureau Veritas Certification Polska Sp. z o.o.).

11 Cross-border impact

The planned project involving the expansion of the DCT Container Terminal is located within the Port of Gdańsk in the area of the Gulf of Gdańsk (internal sea waters).

In accordance with the Act of 21 March 1991 on maritime *areas of the Republic of Poland and maritime administration*, the maritime areas of the Republic of Poland are - called "Polish maritime areas": internal maritime waters, territorial sea and the exclusive economic zone.

Internal maritime waters and territorial sea are part of the territory of the Republic of Poland. Accordingly, the border of the Republic of Poland (state) runs at a distance of 12 nautical miles (22.224 km) counted from the baseline of the territorial sea.

Having analysed the scope of the planned project and having identified its environmental impacts and their scale in this environmental impact report, it should be concluded that the planned project will not cause a cross-border environmental impact.

12 Restricted use area

The planned project involves the expansion of the DCT Container Terminal is located entirely within the Port of Gdańsk. It is a port, industrial and warehousing area. For this type of project and type of land, according to Article 135[36] of the Environmental Protection Law, a limited use area is not created.

13 Analysis of potential social conflicts connected with the planned project

The location of Terminal T 3 is restricted to the sea area within the boundaries of the Port of Gdańsk.

The areas used to serve it are the port areas of Gdańsk - also designated in planning documents for functions related to port exploitation.

The existing use, the nature of the land occupied by the Terminal project, and favourable connections to the transportation infrastructure mean that despite the significant scale of the T3 investment, it should not cause social conflicts either during implementation or during the operation phase.

Also no conflicts related to the requirements of marine environment protection, including nature protection, should be expected, as the project will not be a source of significant and negative environmental impacts as concluded in this Report.

The investment area is not used for fishing purposes. The implementation of investments included in the development plans of the Port of Gdańsk, independently and prior to the planned project, will practically completely exclude the analysed part of the basin from any fishing activity. This issue was explored in Chapter 15 entitled: "Analysis of Possible Social Conflicts" in the report on the environmental impact of the project "Protective breakwaters in Port Północny in Gdańsk" (ECG Orbital, 2015) and in Chapter 12 entitled: "Analysis of possible social conflicts" in the report on the environmental impact of the project "Extension of the approach fairway with the increase of its width and technical depth together with the construction of a turning basin with a diameter of 750 m" (Transprojekt Gdański, 2015). Both reports noted that possible contact with fishing community interests could occur due to possible dredge spoil placement. However, the expected small scale of spoil deposition on the flails and the short duration of this process means that the scale of possible conflict should also be forecast as small. This includes the aspect of general conflict with units moving in the area. The spoil placement area should be excluded from active use by anglers and divers during the period when the spoil discharge is conducted - this will avoid potential conflicts related to the interaction of these activities.

[36] Art. 135. 1. If the ecological review or the environmental impact assessment of the project required by the provisions of the Act of October 3, 2008 on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessments, or a post-execution analysis, it results that despite the application of available technical, technological and organizational solutions, the environmental quality standards outside the area of the plant or other facility cannot be met, then a limited use area is created for the sewage treatment plant, municipal waste landfill, composting plant, transport route, airport, power line and substation, as well as radio communication, radio navigational and radiolocation systems.

Figure 117: Scheme of new ventures in Port Północny of Gdańsk
Widening of the existing approach fairway to Port Północny, new breakwaters, new waterway to Port Północny, new turning basins and new approach fairway to Port Północny
Source : www.portgdansk.pl

The project area is located outside the area of training grounds used by the Navy.

Emissions of pollutants into the air and noise associated with the execution of the investment, especially at the moment of increased concentration of equipment and when performing works to reinforce the bearing capacity of the soil - may affect the air quality and the acoustic climate in the immediate vicinity of the investment. However, these impacts will be temporary, limited to the place and time of the works and will cease after the completion of the project. Similarly, the high frequency of dredging equipment traffic (dredgers, dump barges) may be a nuisance to tourists, however, this will only affect a portion of one tourist season at most, and the developer may conduct an information campaign and other activities to mitigate conflicts if the work had to be conducted during the busy tourist season.

Potentially, the social conflict that emerged in 2018 in the context of the Stogi Sea bathing site and Stogi Beach, on the occasion of works on the draft Study of Conditions and Directions for Spatial Development of the City of Gdańsk, may be extended to the planned terminal expansion project [37]. The conflict was over the designation of land adjacent to the marine bathing site for port functions. The study, providing for such a direction of development, was adopted by Resolution No. LI/1506/18 of the Gdańsk City Council of April 23, 2018[38]. The area of conflict is illustrated in the figure below.

The above conflict concerned the <u>land areas</u> covered by the provisions of the Study. The planned project will be entirely implemented in <u>marine waters</u> and within the boundaries of the Port of Gdańsk, therefore it can be assumed that the implementation of the project will not significantly

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[37] https://www.trojmiasto.pl/wiadomosci/Radni-zdecyduja-o-losach-gdanskiego-studium-n123155.html
https://www.trojmiasto.pl/wiadomosci/10-tys-podpisow-w-obronie-plazy-Stogi-n123087.html
https://s-trojmiasto.pl/download/1/Port_Gdansk_oswiadczenie_Studium.pdf
https://www.trojmiasto.pl/wiadomosci/10-tys-podpisow-w-obronie-plazy-Stogi-n123087.html
http://www.gdansk.pl/wiadomosci/Port-Gdansk-rozbuduje-sie-na-plaze-Prezydent-Adamowicz-proponuje-Pakt-dla-Stogow,a,106177
[38] http://www.brg.gda.pl/planowanie-przestrzenne/studium-uwarunkowan-i-kierunkow-zagospodarowania-przestrzennego, http://bip.brg.gda.pl/attachments/article/685/UCHWALA-W-SPRAWIE-UCHWALENIA-STUDIUM.pdf

escalate the existing conflict. This conflict may also be mitigated by a properly conducted information policy concerning the extension of the DCT terminal, which emphasizes the spatial scope of the project, the importance of the development of the maritime economy and the unique role of the DCT terminal in the Port of Gdańsk and the Polish economy in general (for more details see chapter *"Social and economic significance of the DCT terminal extension")*.

The landscape as seen from the beach in Stogi is already closely associated with the presence of port facilities. Bringing new installations of this type and port activities closer to the beach area would not preclude the functionality of the beach. There will be an increase in the landscape impact, which is essentially related to the existence of the port, particularly Port Północny, and therefore has been subject to transformation for about 40 years. It was also associated with some of the most important projects of the Polish economy - the construction of Port Północny, including the construction and development of Naftoport, or currently with the PERN fuel depot and DCT.

Figure 118: Figure from a presentation on Study of conditions and directions for spatial development of the city of Gdańsk
Source : www.trojmiasto.pl

14 Social and economic significance of the expansion of the DCT terminal

14.1 Introduction

Today, the functioning and development of the socio-economic system of the country depends largely on trade, which allows to significantly increase the market for goods produced in the country (export), as well as to expand the range of goods consumed by citizens. As a result of international trade activity, the level of economic development (GDP) increases, as well as the welfare of citizens undergoes positive changes. Key to the development of the Polish economy is the possibility of efficient and cost-competitive export of Polish products to overseas markets offered by direct ocean container calls at the DCT Gdańsk terminal.

A prerequisite for the efficient handling of trade is access to operationally and cost-effective transportation services, which is particularly important in intercontinental trade. In this case, the country's access to the sea and the resulting ability to handle cargo is a particularly valuable asset. Having a well-developed port infrastructure, which is understood as adequately prepared in terms of operation reloading terminals, not only determines the possibility of servicing domestic trade but also provides an opportunity to provide services for neighboring countries in the framework of transit reloading.

Modern economy, in which the processes of outsourcing and offshoring have resulted in the transfer of a significant part of the production of consumer goods to Asian countries requires an efficient system of handling cargo streams, where container technology is of particular importance. This is because it enables efficient and safe transport of cargo, both by sea and by land transport modes, as well as facilitates reloading. Maritime container carriers seeking to further improve the performance of the transportation system are increasingly seeking to take advantage of economies of scale, resulting in a process of container vessel size expansion, ocean service lengthening, and integration between service providers, both through mergers and acquisitions and the formation of shipping alliances.

All the above-mentioned phenomena are also observed in Poland, where high dynamics of container reloadings in sea ports is visible. This turnover is in large part due to the dynamic development of the domestic economy, as well as the available service potential in seaports, which enables the handling of global container services - DCT Gdańsk terminal. Maintaining such favourable trends, however, requires continuous development of the services offered, which can be largely identified with the reloading potential existing in sea ports. Thus, there is no doubt that further investments in port infrastructure and suprastructure are necessary, especially in view of Poland's rapid economic growth and trade, as well as the needs generated in its environment (especially the Russian market and Eastern European countries, whose needs can be met by Polish ports to the benefit of the domestic economy).

It should also be added that seaports themselves are a pole of economic growth, both regionally and nationally. They are a place of economic activity (new businesses), create numerous jobs, and allow to generate budget revenues (customs duty, excise duty, PIT, CIT).

This chapter synthesizes the prospects for the development of the container market in Poland and confronts the results with the current supply of services, which was particularly true of the potential for handling ocean-going vessels. At the same time it shows the socio-economic effects generated by the functioning and development of seaports.

It should also be emphasized that Polish seaports operate in a competitive environment, so it is important to quickly respond to market needs and plan infrastructure investments in a long-term perspective. This should avoid supply shortages and thus provide customers with quality service in a dynamic market.

14.2 DCT Gdańsk terminal on the global container shipping market

Global containerized cargo market estimated at 1.72 billion tons in 2016[39] is the fastest growing part of the global ocean freight market. During the period 2000-2016, the average volume growth (CAGR[40]) of container traffic reached 6.8% with an average of 3.4% for total traffic. Converting the cargo weight to the number of containers, it indicates about 145 million TEUs transported by sea in 2016.

Maritime container traffic is, of course, determined by port reloadings, which are determined to be 701.4 million TEUs in 2016. Again, a high growth rate (CAGR) is observed, averaging 7.0% over the 2000-2016 period. In 2017, container throughput reached 734 million TEUs, representing a further 4.6% growth.

As a result, the market for maritime container transport on the Baltic can be regarded as particularly dynamic, especially after 2004. This is mainly due to the historical background (low level of use of container technology in the former Eastern Bloc countries), the rapid pace of economic development of the countries in the region, as well as the increase in the share of intercontinental freight exchange by sea transport.

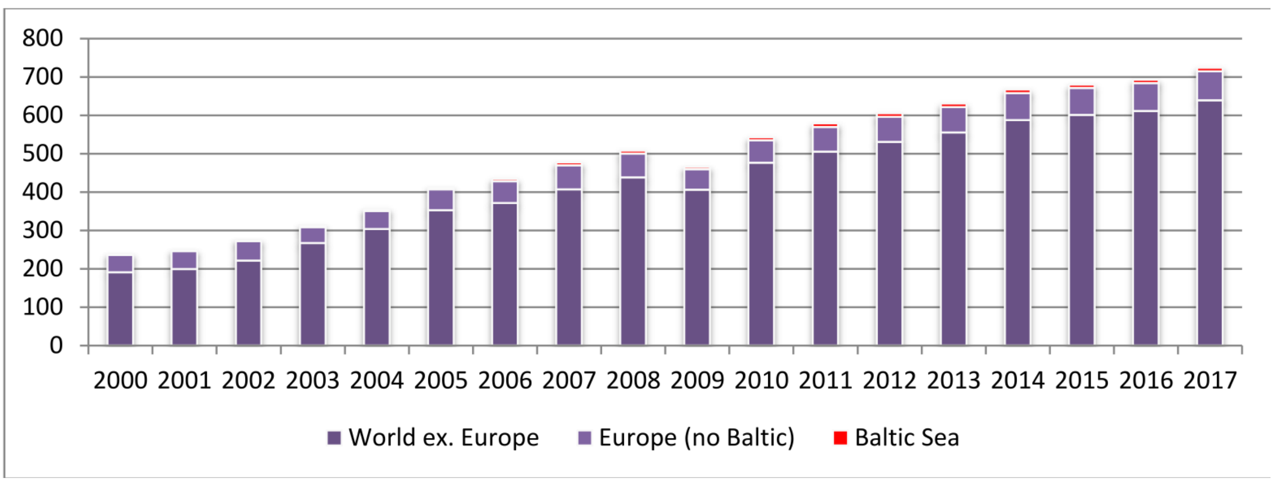

Figure 119. World container reloadings 2000-2017 [million TEU]
Source: Own study (World ex. Europe - the world without Europe; Europe (no Baltic) - Europe (without Baltic)

Container throughput in the Baltic Sea area reached 9.89 million TEUs in 2017, representing an average annual growth rate of 5.6% compared to 2004. When analyzing individual national markets, one can refer to the record growth in reloading turnover achieved in Poland, averaging 13.7% per year (2004-2017). There is no doubt, therefore, that the Polish container handling market is the regional leader, which results both from high internal demand (servicing of Poland's trade exchange) and from the fact that since 2010 the ocean container connections operated at the DCT Gdańsk terminal have been launched (which determines the handling of the transhipment stream to/from Russia).

[39] Review of Maritime Transport 2017. UNCTAD 2017.
[40] CAGR - Compound annual growth rate

The domestic container market, which recorded a record 2.38 million TEUs in 2017, currently consists of three port centres with four container terminals (figure below).

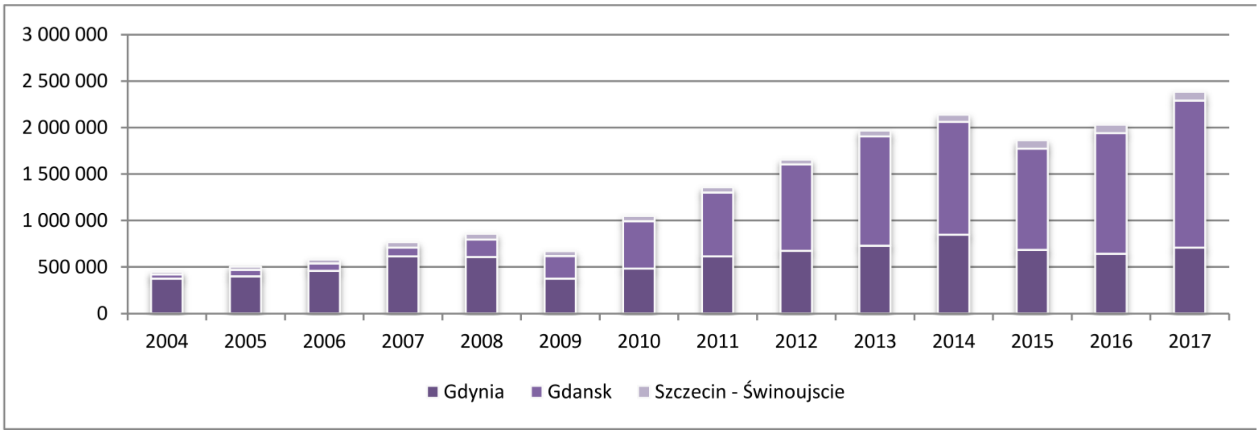

Figure 120. Container handling in Polish seaports in 2004-2017 [TEU]
Source: Own study.

The market leader is DCT Gdańsk terminal with a share of 66.8% (2017), which is the only terminal capable of handling ocean-going vessels. The terminal opened in 2007 and handled 1.6 million TEUs in 2017. Large domestic terminals operating in the feeder market include Gdynia's BCT and GCT terminals, which are the closest competitors to DCT Gdańsk (however, the terminals do not currently have the capacity to handle large ocean-going vessels). Other centres in the country have regional significance.

An important aspect of DCT Gdańsk's operation and development is foreign competition with German North Sea ports (ocean-going vessels, followed by container deliveries by sea - feedering or land - rail intermodal or road transport, to Poland and other countries in the region) and the ports of Rotterdam and Antwerp being the main destinations. In the long run, Polish ports may also compete with ports of the Baltic states, where new deepwater container terminals are planned (e.g. Klaipeda, Riga, Stockholm).

In summary, it is possible to indicate a strong correlation between the situation in the domestic container handling market and global trends while emphasizing the significantly higher growth rate in Poland. This is mainly due to the above-average (compared to Europe and the world) GDP growth, as well as still existing differences in trade intensity and the use of container technology in Poland and the European highly developed countries.

14.3 Forecast of container reloading development in Polish seaports

The starting point for determining future increases in container reloading at seaports in Poland is global development prospects. In this case, stable but moderate volume growth compared to previous years is indicated. The observation of macroeconomic data at the global level shows the process of levelling off the growth rate of the world gross product and trade with the simultaneous increase in the share of container technology in its handling. This phenomenon is confirmed by estimates of the container market outlook.

According to the forecasts of leading centres, positive changes are expected to continue in the following years. For example, BIMCO forecasts 4.0%-4.5% growth in container shipping demand in 2018. A slightly higher growth rate in 2018 is assumed by Alphaliner (4.8%). Hapag-Lloyd, the world's fifth-largest container carrier, estimates that global container volumes will grow between 4.8% and 5.1% annually between 2018 and 2021. DHL is slightly more cautious about the market outlook, as it forecasts an average cumulative annual growth rate of 2.3% for the period 2018-2021[41].

Taking into account the differences observed in recent years in the rate of growth of container volumes at the global level, the Baltic market and Poland, it can be assumed that future growth in the domestic market will be higher than forecasted globally. A particularly important factor confirming such a trend is the relatively low level of Poland's intercontinental trade activity served by container technology. This can be equated with great potential for further development of transoceanic trade.

A comparison of selected European countries[42] and Poland in terms of the number of containers handled (TEUs) per person, or the number of containers in relation to GDP level shows significant differences (figure below). On the other hand, an analysis of the indicators' growth dynamics indicates a faster advancement in Poland, which in the perspective of a dozen or so years will mean a gradual levelling of their level.

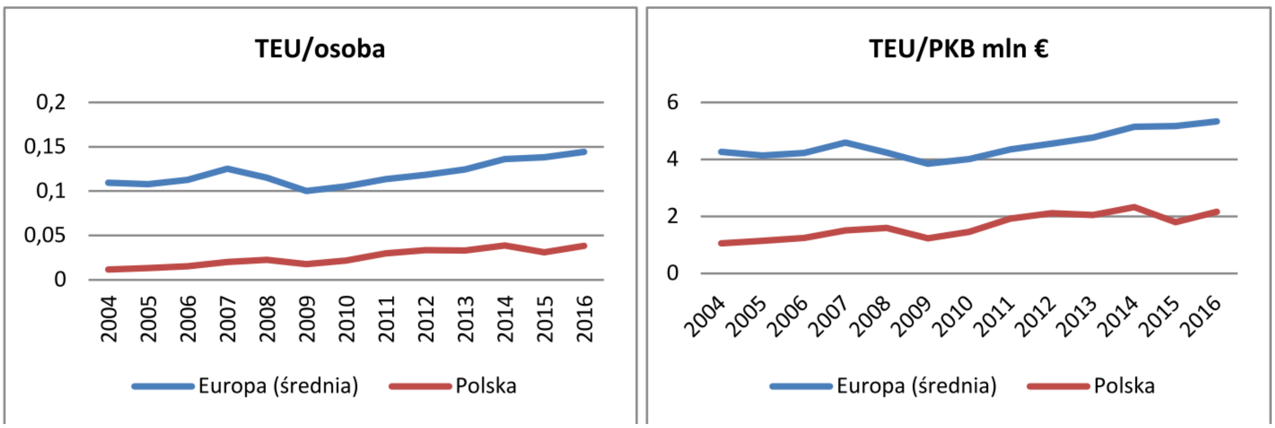

Figure 121. Container market benchmarks for Poland and selected European countries
Source: Own study.

Taking into account the process of equalization of index values and changes in macroeconomic parameters (GDP growth, demographic changes) it is possible to estimate the future volume of container reloadings in Polish seaports (figure below). According to estimates, in the period 2018-2029, there will be a leveling off of the intensity of the use of container technology in trade, and in subsequent years, the growth will be determined by the pace of the country's economic development (the development of container trade will fit into the global pace).

41 M. Matczak, *Trends and challenges for the global container market in 2018.* www.gospodarkamorska.pl

42 The following countries were included in the analysis: Denmark, Finland, France, Greece, Portugal, Sweden, United Kingdom.

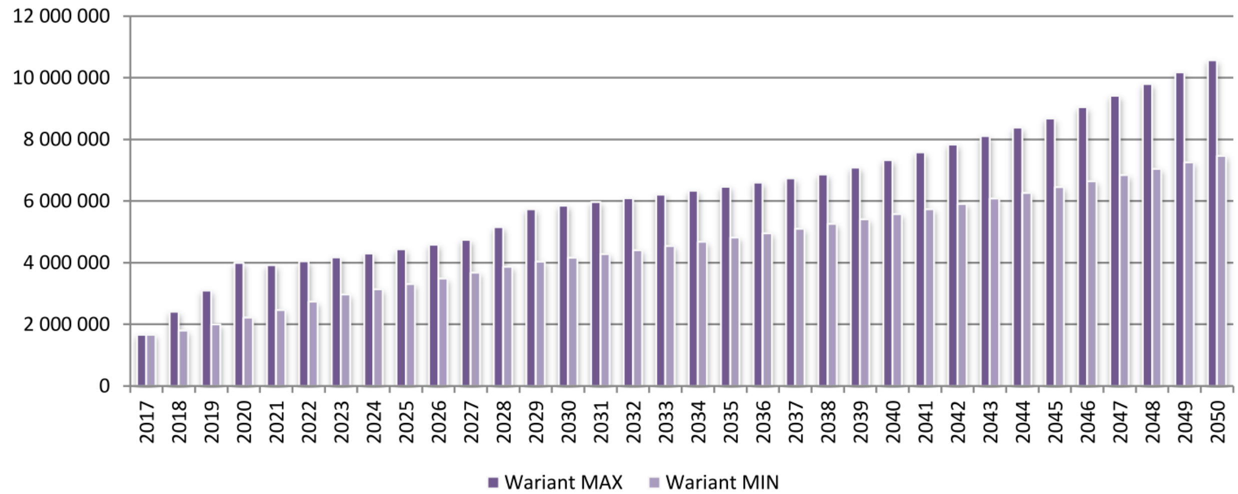

Figure 122. Forecast of container reloadings development connected with support of Polish foreign trade till 2050
Source: Author analysis by M. Matczak (5.06.2018).

Depending on the structure of the used indicators and the dynamics of their changes, the maximum and minimum options of the forecast can be determined (in the further part of the study the average option, which is the arithmetic result of the two extreme options, will also be taken into account).

Another important market segment is the handling of transit cargo, which refers to both so-called sea transit and land transit. The operation of ocean container services by DCT Gdańsk determines the development of maritime transit, as containers arriving in Gdańsk are distributed to the Baltic Sea region (especially to ports in the Gulf of Finland). Analysis of statistical data from recent years (2010-2016) indicates that the share of sea transit in the total container reloadings in Poland was on average 28.4%[43] (with respect to Polish HZ reloadings it was 41.4%). Thus, for 2017, maritime transit turnover was estimated to be about 713,000. TEU. Thus, when forecasting future reloadings, it is possible to assume the continuation of the current structure: Polish HZ - sea transit (maximum option) or stagnation at the 2017 level (minimum option). As a result of the recalculations, for the maximum option, maritime transit reloadings of 4.06 million TEUs in 2050 were obtained.

However, it should be emphasized that further increase in the number of ocean connections serviced at DCT Gdańsk should result in further and significant increases in transhipments, which to a large extent determines the return of the Russian market to the path of rapid growth. Therefore, even the maximum option can be considered as a conservative estimate.

A development opportunity for the container market is also the wider handling of the inland transit cargo stream, which predominantly involves countries such as: Belarus, Slovakia, Hungary, Ukraine. Despite the fact that currently the total share of this type of relations is marginal (in 2016 it was 9.8 thousand tons of containerized cargo[44]), growth can be expected also in this area (inland transit was omitted in the presented estimates). Due to the lack of direct access to the sea and the proximity of DCT Gdańsk, these countries will constitute a solid base for transit cargo lines in the future.

43 Statistical Yearbook of the Maritime Economy 2011-2017. CSO Warsaw/Szczecin 2011-2017.
44 Marine Statistical Yearbook 2017. CSO Warsaw/Szczecin 2017.

In summary, it can be estimated that the total growth of the port container handling market in Poland should result in reaching a volume of 8.2 million TEU (minimum option) to 15.0 million TEU (maximum option) in 2050. Therefore, assuming that DCT Gdańsk maintains its current market position (66.8% share), we can calculate the potential demand for its services of 5.5 - 10.0 million TEU (average 7.7 million TEU) in 2050.

14.4 DCT Gdańsk service potential for container handling

The forecast of potential demand for services at DCT Gdańsk presented above should be consistent with the supply of services offered there. According to the characteristics of the investment project presented earlier, the current reloading capacity of the terminal (after the completion of the currently implemented development program) will amount to 3-3.5 million TEU per year[45]. Implementation of the subsequent phases of the T3 project (regardless of the choice of the location option) will increase the handling capacity of the terminal by 1.3-1.7 million TEU for each of them (ultimately for the whole DCT: 8 million TEU (perhaps slightly more, as this depends on the target logistics layout, among other things). Assuming the above assumptions, and at the same time relating it to the obtained demand forecasts, one can determine the mutual dependencies, which is presented in the figure below.

Focusing on average forecast values, it can be pointed out that the **urgent need for additional supply of reloading potential will emerge already in 2020** (deficit of 420 thousand. TEU). However, only DCT Gdańsk is capable of handling the sea transit traffic (ocean-going vessels), which is key to the development of the Polish economy, and therefore in the coming years it can be assumed that 100% of this traffic (rather than the estimated 66.8%) will go to Gdańsk. **So the deficit problem could come even sooner.**

Implementation of the first phase of the T3 development (Phase 1 or Phase 3) will allow for the management of additional market demand and a possible deficit may occur around 2031. However, if DCT Gdańsk remains the only deepwater terminal in the country capable of handling ocean-going vessels, the problem of supply shortage will appear as early as 2028.

45 The optimal operational handling capacity will then be 2.8 million TEUs per year, and according to other analyses, 2.45 million TEUs per year.

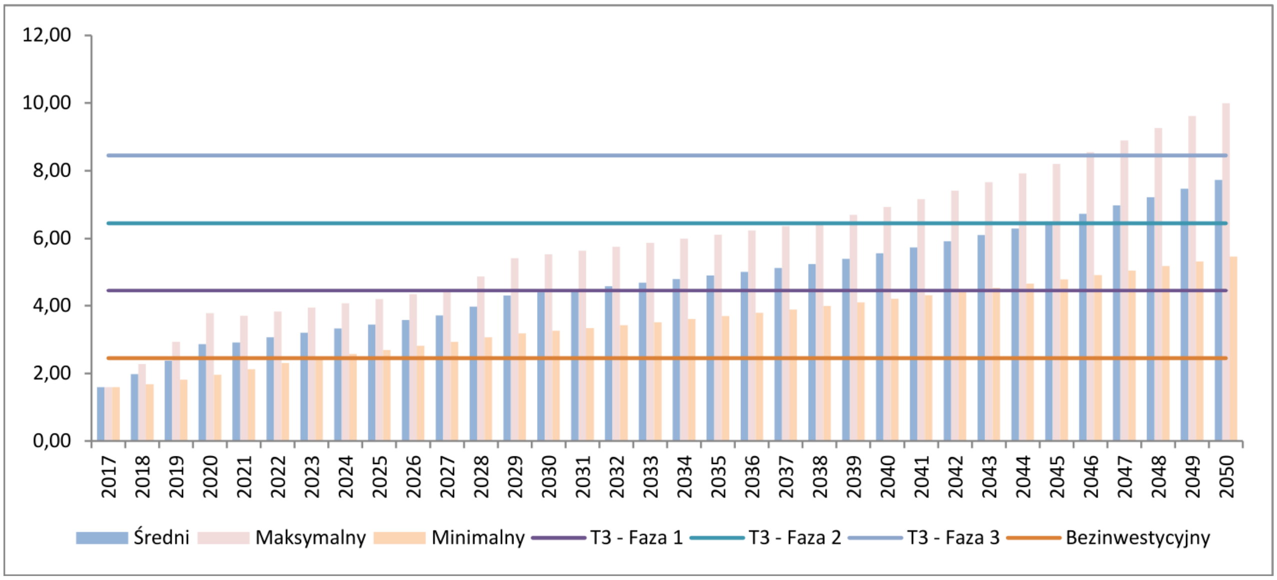

Figure 123. Market development in the perspective of development plans of DCT Gdańsk SA
Source: Own study.

Analogous time periods can be determined for phases 2 and 3. The analysis of future container volumes and supply of reloading services at DCT Gdańsk presented above points to two main conclusions. First, there is a very urgent need for the first phase of the T3 project, as supply shortages will occur within 2-3 years. The second conclusion is that the decision to implement subsequent phases should be made contingent on future, real market changes (growth paths).

If the investment is not carried out, the activity of ocean carriers will be limited to the existing two calls per week, forcing them to look for other locational alternatives outside Poland (e.g. Klaipeda, Riga, Gothenburg, Aarhus, Stockholm). Although there are development projects in the country to build new deep-water container terminals - the Gdynia Container Terminal, the external port in Swinoujscie, and the so-called Central Port in Gdańsk - all of these investments are currently in the conceptual planning and first design attempts phase. Most importantly, there is a lack of entities ready to invest adequate funds in the project today, and at the same time having relevant experience and practice in running the container port business.

14.5 Social and economic benefits of DCT Gdańsk terminal development for the city, region and country

Sea ports, apart from their obvious function of reloading and storage, also perform important city- and region-forming functions, which in particular refers to the creation of the labour market, and thus generating tax revenues (e.g. PIT), or other budgetary income. Ports themselves, as multi-entity structures, will generate multiplier effects, which should be understood as impacts on the economic environment. As modeled[46] this impact can be analysed at four basic levels:

- Seaport - understood as reloading companies (terminals), port authorities and companies supporting maritime transport[47].

[46] Methodology of analysis based on the study: M. Matczak, *Report - Polish seaports as a pole of economic development of the country and location regions,* Port of Gdynia/Baltic Container Terminal Stakeholder Council/Actia Forum, Gdynia 2017.

[47] The group "maritime transportation support activities" includes navigation, piloting, salvage, dredging and underwater work, port and marine services, towing, mooring and others.

- Port sector - comprising maritime transport companies (shipowners) and the activities of maritime agencies[48].
- Immediate environment - including marine R&D and education and other marine related activities[49].
- The economic environment of ports - identified as transportation resources, and export industries that use maritime transportation services.

Relating the above arrangement to the current situation of the port sector in Poland, the following multiplier effects between individual areas in selected categories can be pointed out (Figure below).

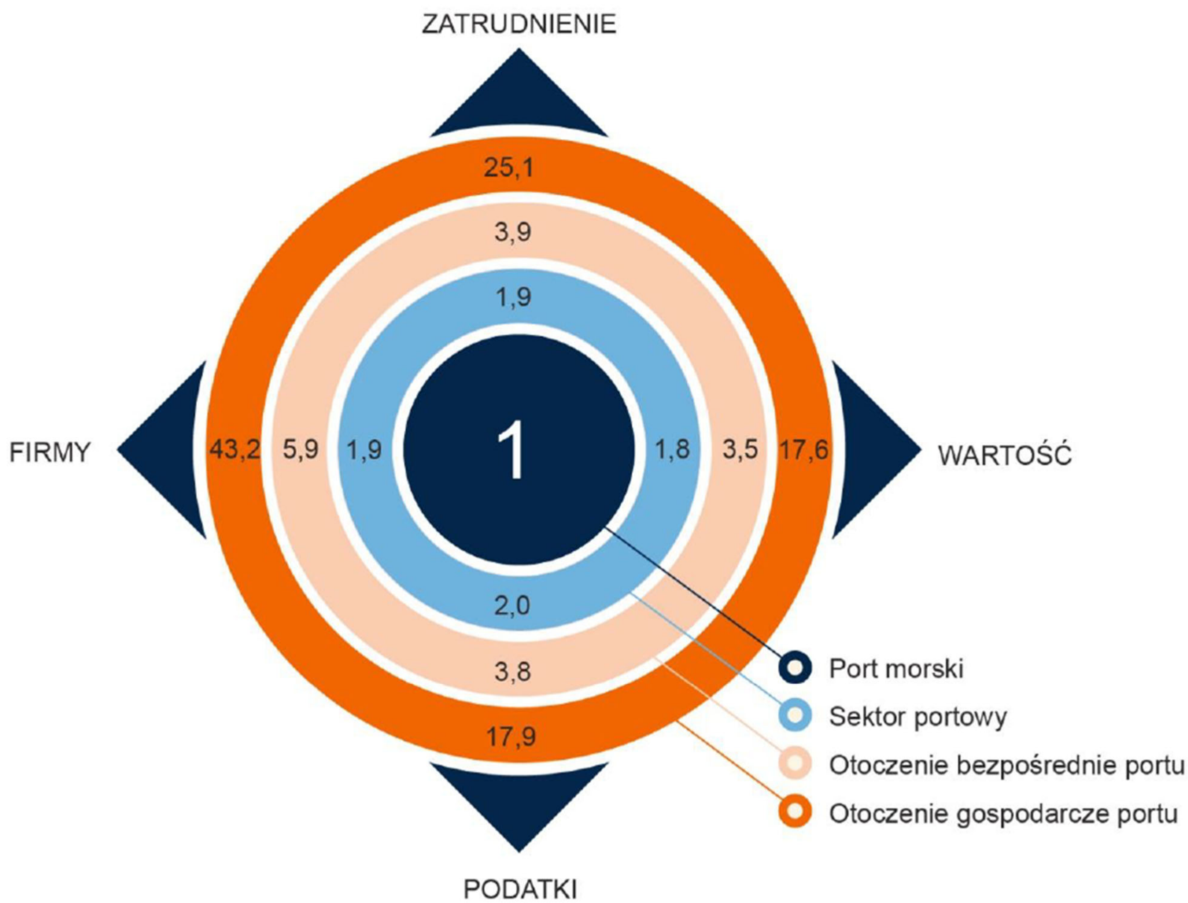

Figure 124. Multiplier effects of seaports
Source: M. Matczak, Report - Polish seaports as a pole of economic development of the country and location regions, Port of Gdynia/Baltic Container Terminal Stakeholder Council/Actia Forum, Gdynia 2017.

Based on employment issues, the results presented should be interpreted as follows - one job at the terminal creates an additional 2 jobs at the seaport itself (local level) and four jobs in the region. At the same time, it generates a need for another 25 people in transportation resources and in the

48 The group "transportation agencies" includes: customs agencies, maritime agencies, brokerage, maritime consulting, maritime expertise, cargo stowage and securing expertise.
49 The "other" group includes offshore oil extraction, construction of water engineering facilities for the maritime economy, architectural, engineering activities for the maritime economy, rental of water transport facilities, consulting, technical research and analysis, recruitment of employees and other activities for the maritime economy.

industry that exports its products using shipping. The multiplier effect of investment activity directed at seaports is therefore evident.

Using the simplified assumptions presented above regarding the impact of the port terminal on the socio-economic system, the effects of implementing (or abandoning) the T3 investment can be estimated.

According to information, the average employment at DCT Gdańsk is currently 900 people[50], so it can be assumed that subsequent phases of the terminal extension will increase the number of employees by about 500 people on average[51]. As a result, full implementation of the T3 project will result in an increase in employment to 2,400 people, which, using the multipliers presented above, should be equated with an increase in employment in its environment (table below).

Table 85. Multiplier effects of the DCT T3 investment with respect to the labour market [persons]

	Terminal	Sektor portowy	Otoczenie bezpośrednie portu	Otoczenie gospodarcze portu
Aktualnie	900	2 610	4 410	23 490
Faza 1 (+aktualnie)	1 400	4 060	6 860	36 540
Faza 1+2	1 900	5 510	9 310	49 590
Faza 1+2+3	2 400	6 960	11 760	62 640

Source: Own work

Thus, the abandonment of investment will result in a reduction in the number of jobs (social loss) in the port region by approximately 13,300. (sum of losses at the level of the immediate environment).

The estimated values of the number of employed people in the region can also be translated into monetary values, as the new jobs will contribute to the creation of added value and GDP in the region and the country. Assuming the value of 129.8 thousand zlotys as the value of GDP per employee (data for 2015)[52] it can be indicated that the investment will allow to increase the GDP of the region by 1.7 billion zlotys per year. This value can be equated to 1.6% of the value of GDP currently created in the Pomorskie Voivodeship. Importantly, the operations of DCT T3 will also generate an additional 5.1 billion PLN of national GDP (economic environment).

Considering further the level of remuneration received by persons employed in the port sector[53] , it is possible to calculate the total level of remuneration of persons in the region whose work will be associated with the operation of T3 (760.6 million PLN annually), as well as the level of tax revenues on this account. Assuming a model division of PIT budget revenues, we can distinguish revenues for particular levels of government (table below).

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[50] Economic Forum of TVP Gdańsk

[51] This is a model assuming a disproportionate increase in the number of employees in non-operating departments.

[52] The GDP of Pomorskie Voivodeship was 103,397 million PLN, while the number of employed people (actual jobs) was 798,217 in 2015.

[53] The average salary in the maritime economy was assumed at the level of 4801.87 PLN gross per month (value for 2016). *Marine Statistical Yearbook 2017.* CSO Warsaw/Szczecin 2017.

Table 86. Annual Estimated PIT Revenue from Construction of the DCT T3 Terminal[54]

	Udział	Terminal	Sektor portowy	Otoczenie bezpośrednie portu	Razem
Polska	48.8%	7,593,889 zł	22,022,277 zł	37,210,054 zł	66,826,219 zł
Pomorskie	1.6%	248,929 zł	721,894 zł	1,219,752 zł	2,190,575 zł
Miasto Gdańsk	49.6%	7,715,241 zł	22,374,200 zł	37,804,683 zł	67,894,124 zł
Razem	100%	15,558,059 zł	45,118,371 zł	76,234,488 zł	136,910,917 zł

Source: Own study.

The last of the identified areas of socio-economic impact of the implementation of the T3 project is the increase in potential revenue from VAT, customs and excise taxes on goods imported from outside the European Union. The development of transoceanic connections will result in a significant increase in the share of goods cleared in Poland (and not in other European ports within the *hub-and-spoke* relationship [55]).

According to CAAC data, the total customs, VAT and excise revenues generated at the Customs Branch "Container Terminal" in Gdańsk amounted to PLN 7.44 billion in 2015 (of which PLN 6.7 billion is VAT revenue). Taking into account the reloadings at the DCT Gdańsk terminal at that time (1,069 thous. TEU) it can be estimated that one serviced container generates 6957 PLN of budget income. Translating this into projected reloadings in a simplified way, the potential revenues resulting from the T3 project can be estimated (figure below).

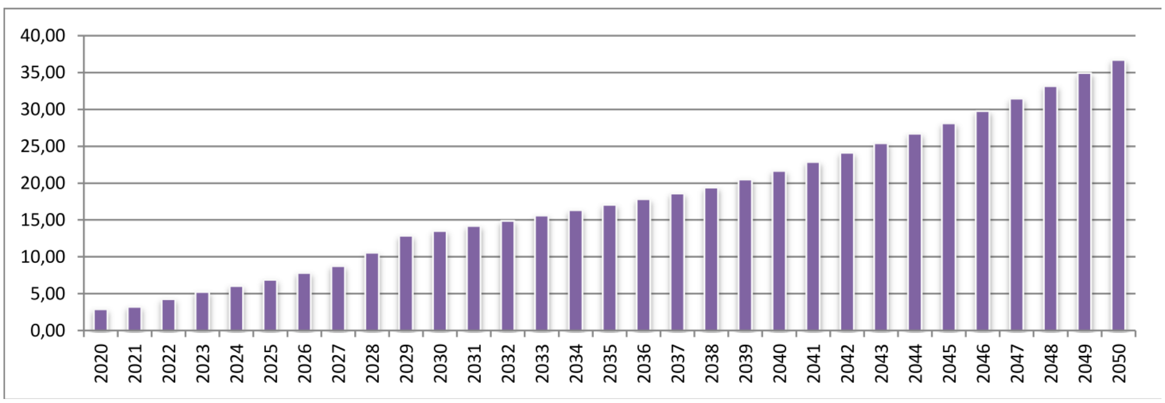

Figure 125. Estimated revenues from border revenues (import VAT, customs, excise duty) resulting from the implementation of the T3 project [billion PLN]
Source: Own study.

In total, the estimated revenue from the analysed border fees would amount to PLN 551.9 billion in the period 2020-2050. Failure to make the investment, and thus the flight of cargo to foreign seaports, may therefore lead to an irreparable loss of revenue and thus a decline in social welfare in the region and the country.

14.6 Summary and conclusions

Summarizing the above analysis, a number of conclusions can be defined, including:

The global container market is expected to grow steadily in the coming years, so further increases in the number of containers transported by sea can be expected.

[54] A model taxation of PIT in the amount of 18% of gross income was assumed.
[55] Location of warehouses and organization of traffic between them on the principle of a radial structure.

The search for economies of scale will continue to encourage shipowners to use ever larger vessels and to develop direct ocean links to peripheral markets (the Baltic Sea).

Currently in Poland there is only one terminal capable of handling the largest container ships in the world - DCT Gdańsk. The terminal has the right business relationships, commercial and operational experience, knowledge and know-how, and excellent relationships with major global container operators (including Maersk Line, MSC, CMA-CGM, COSCO).

Development plans for other deepwater terminals in the country (Gdańsk, Gdynia, Swinoujscie) are currently at the conceptual and design stage and do not have guaranteed financing, business relationships (cargo volumes) and operational support to enable their rapid start-up and effective operation. However, these projects can be considered as an additional source of supply with a booming market (maximum option) in the long term (after 2030).

The Central Port in Gdańsk could be a place for further development of DCT Gdańsk (after final development and effective exploitation of T 3). In the maximum option, supply shortages may become apparent around 2045, and if we assume that the increase in handling capacity of each T 3 stage is not 2 million TEUs but 1.3 million TEUs, then already around 2035.

The Polish economy is still catching up to the development gap with highly developed countries, which manifests itself in lower trade activity in overseas markets, as well as a lower level of use of container technology. This results in a significantly faster pace of growth in the trade container market, which should directly translate into a dynamic increase in demand for cargo handling services in the coming years.

The development of the network of ocean connections served by DCT Gdańsk terminal also allows the handling of transit traffic (maritime transit), which in view of the growing demand for transport from other countries in the Baltic Sea region (especially the Russian market) will strengthen the rate of volume growth.

Thus, the lack of prompt investment activities will contribute both to the transfer of Polish foreign trade cargo to other ports (e.g. Hamburg, Rotterdam) and to the stopping (and consequently regressing) of the distribution function of the port of Gdańsk.

The construction of the DCT T3 terminal should be considered as an important factor generating development impulses for the local and regional socio-economic system, as the terminal in its final shape will generate up to 13.3 thousand jobs in the Pomorskie Voivodeship, including more than 4 thousand in the Port of Gdańsk itself.

The economic development of the city and region determined by the DCT T3 investment will also create additional value, both at the local and national levels. It is estimated that the target implementation of the project will increase the GDP of the Pomorskie Voivodeship by 1.6%, i.e. PLN 1.7 billion annually. Nationally, this could be an additional PLN 5.1 billion a year.

The terminal and the companies that cooperate with it in handling containerized cargo will also be a source of additional budget revenue. As far as the PIT is concerned, the target level is PLN 76 million a year, of which almost PLN 38 million will go to the budget of the City of Gdańsk.

It has been pointed out that the current functioning, and in particular the expansion of the DCT terminal, which is a prerequisite for further development of the ocean container shipping network, will also foster an increase in customs and tax revenues resulting from the handling of cargo from outside the EU. Simplified estimates allow for estimating the amount of revenue from the analysed fees at the total level of PLN 551.9 billion in 2020-2050 (assuming the current market structure in terms of ocean connections - feeder connections).

The assessment of the effects of the investment, both in the economic, social and environmental context must take into account all the conditions, and in particular the losses that the region will suffer as a result of abandoning the investment. At the same time, both the design and the subsequent operation of the terminal must take into account the demands of the environment in a compromise way, so that the final result of the T 3 project is an increase in the prosperity of both the local community and the development of the national economy.

The conditions, motives and effects described above justify recognizing the planned project also as a manifestation of the realization of the public interest, as well as giving it the rank of an activity of national importance.

Since the planned T3 terminal, either on its own or as part of the DCT Container Terminal or in combination with other projects, will not cause a significant and negative impact on Natura 2000 sites, there is no need to examine whether the public interest in building this terminal overrides the conservation objectives of Natura 2000 sites and nature conservation interests. Consequently, the conditions of Article 34 of the Nature Conservation Act (Article 6.4 of the Habitats Directive) will not apply, as they are not relevant in the circumstances of the project.

The public interest in the expansion of the DCT Terminal, its connection to the only location that allows handling vessels with a draught of 17 m in the southern Baltic, as well as the finding of no significant impact on the Natura 2000 site, also provide justification for the project despite its interference (location) with the Natura 2000 site.

It should also be noted that there are reasonable grounds to consider the reasons for constructing the T3 terminal, even if the investment creates a collision with the protection objectives of Natura 2000 areas, as imperative, and thus as supporting the undertaking of the project.

15 Indication of difficulties arising from technical deficiencies and gaps in contemporary knowledge

At this stage of the impact assessment there is no specific information regarding the actual presence of objects of cultural value or munitions on or below the seabed in the area of the planned project. Therefore, in both cases, it was recommended that appropriate studies be conducted so that potential problems in this area are recognized before work begins.

16 Summary and conclusions, description of predicted actions aiming at prevention or limitation of negative environmental impacts and monitoring of the planned project impact

1. The planned project consists of the expansion of the existing DCT Deepwater Container Terminal with a new plant - another terminal within DCT Gdańsk SA, under the working name "T 3". The implementation of the terminal will result in the need to carry out dredging works in the reservoir adjacent to T 3. Due to technological connections, this dredging is considered part of the project, although its investor may be another entity responsible for providing access to the port. Implementation of the project may create the need to perform adaptation works at Terminals T 1 and T 2, functionally related to it.
2. The expansion of the DCT Container Terminal in Gdańsk is of great importance for the modernization and development of handling and storage potential of Port Północny in Gdańsk. It will further increase the competitiveness and improve the performance of the Port of Gdańsk. Within the DCT Container Terminal and its accompanying service functions, several hundred additional people will find employment.
    - Currently in Poland there is only one terminal capable of handling the largest container ships in the world - DCT Gdańsk. The terminal has the right business relationships, commercial and operational experience, knowledge and know-how, and excellent relationships with major global container operators (including Maersk Line, MSC, CMA-CGM, COSCO). Development plans for other deepwater terminals in the country (Gdańsk, Gdynia, Swinoujscie) are currently at the conceptual and design stage and do not have guaranteed financing, business relationships (cargo volumes) and operational support to enable their rapid start-up and effective operation. Thus, only DCT is currently capable of receiving and handling ocean-going container vessels that have a draught of 15 m.
    - The lack of prompt investment activities in Gdańsk will contribute both to the transfer of Polish foreign trade cargo to other ports (e.g. Hamburg, Rotterdam) and to the stoppage (and consequently regression) of the distribution function of the port of Gdańsk. The construction of the T3 terminal should be considered as an important factor generating development impulses for the local and regional socio-economic system, as the terminal in its final shape will generate up to 13.3 thousand jobs in the Pomorskie Voivodeship, including more than 4 thousand in the Port of Gdańsk itself.
    - The economic development of the city and region determined by the T3 investment will also create additional value, both at the local and national levels. It is estimated that the target implementation of the project will increase the GDP of the Pomorskie Voivodeship by 1.6%, i.e. PLN 1.7 billion annually. Nationally, this could be an additional

PLN 5.1 billion a year. The terminal and the companies that cooperate with it in handling containerized cargo will also be a source of additional budget revenue. As far as the PIT is concerned, the target level is PLN 76 million a year, of which almost PLN 38 million will go to the budget of the City of Gdańsk.

- The functioning and, in particular, the expansion of the DCT Terminal, which is a prerequisite for the further development of ocean container traffic, will foster an increase in customs and tax revenues resulting from the handling of non-EU cargo. Simplified estimates allow for estimating the amount of revenue from the analysed fees at the total level of PLN 551.9 billion in 2020-2050 (assuming the current market structure in terms of ocean connections - feeder connections).

3. The planned expansion of the DCT Container Terminal will include: dredging, filling, construction of piers and quays, construction of storage areas and transport solutions including handling equipment and adaptation works - it will be organizationally and functionally related to the existing DCT Container Terminal.

   - The project, which will be carried out solely on water, will eventually lead to the construction of three additional berths with a total length of approximately 1,650 m and storage yards adjacent to the existing T1 terminal, where a technologically autonomous reloading terminal will be created. Up to 95 hectares of marine area will be infilled. Construction of the quays and storage yards, circulation areas and other elements of the new terminal will be phased. The area intended for the execution of the project includes the body of internal sea waters, not specified in the land register, within the boundaries defined by the hexagon with geographical coordinates of the vertices: 18° 43' 33'', 54° 23' 30''; 18° 43' 09'', 54° 22' 58''; 18° 43' 18'', 54° 23' 21''; 18° 43' 50'', 54° 22' 41''; 18° 44' 25'', 54° 23' 16''; 18° 44' 56'', 54° 23' 04''. The expansion may require adaptation and organizational changes at the existing DCT container terminals: T 1 and T 2, which will be the subject of separate undertakings.
   - The enlargement of the terminal in the first phase will enable an increase in handling capacity of the DCT terminal by about 1.3-1.7 (max 2) million TEU) in the perspective of 2021-22. In the next two phases DCT's handling capacity is to be increased by another 1.3-1.5 (max 2) million TEU. The planned Container Terminal T 3 will include reloading berths to be constructed as an extension of the existing T 1 Terminal berths in the north and east directions. Up to 95 hectares of marine area will be infilled. In the area of harbour waters adjacent to the newly built quays, dredging works will be performed in order to create an approach and maneuvering basin for the planned T3 berth. An area of approximately 38 ha will be dredged. The anticipated implementation of T 3 will occur in three phases. During the operations phase, the use of the T 3 terminal will be functionally related to the T 1 and T 2 terminal facilities, while maintaining the distinctiveness and integrity of each facility.

4. The construction of a modern intermodal transport complex is consistent with the strategic documents on the EU, national and voivodship level and the city of Gdańsk. DCT Terminal is located in the 6th Corridor of the European TEN-T network, it was included in the "Concept of Spatial Development of the Country 2030" adopted at the end of 2011 by the Council of Ministers, at the regional level the construction of DCT Terminal is in line with "The Spatial Development Plan of Pomorskie Voivodeship 2030", "Development Strategy of Pomorskie

Voivodeship 2020" and the findings of "Regional Strategy for Transport Development in Pomorskie Voivodeship 2007-2025".

Terminal T 3 is to be located in an area resulting from the inundation of a sea basin - therefore it is not currently subject to local spatial development plans.

5. The planned project is located within the boundaries of one area form of nature protection within the meaning of the Act on Nature Protection of 16 April 2004: the "Zatoka Pucka" PLB220005 special bird protection area.
6. The planned project is located within the boundaries of the transitional water body Inner Gulf of Gdańsk with the code PL TW IV WB4.
7. The project will result in the destruction of existing seabed habitat (invertebrates/macrozoobenthos) on a total area of approximately 133 ha, with up to 95 ha of the area planned for the new T3 terminal to be flooded, which should be considered a permanent loss of habitat associated with sandy/muddy nearshore seabed. The analysed fragment of the Gulf of Gdańsk bottom in the area of the planned investment is characterized by moderate and low level of biodiversity, average biomass, lack of protected species and habitats. Opportunistic species with a wide range of tolerance to varying or changing environmental conditions were found among the dominant organisms in terms of abundance and biomass. Therefore, it should be concluded that permanent destruction of a fragment of the gulf bottom on an area of approx. 95 ha (the planned terminal) and conversion of an area of approx. 38 ha, in the context of moderate biocenotic values, will be a minor impact, given the wide distribution of analogous habitats in the entire Gulf of Gdańsk. This impact will have no significant impact on ichthyofauna in the Gulf of Gdańsk. These impacts will be local in nature and will not affect fish habitat in a broader spatial context.
8. During the year-round bird surveys in Port Północny area (Orbital 2016), the most abundant birds recorded were: gull (7 species), cormorant, velvet scoter, merganser, mute swan, smew, dunlin, great Eurasian curlew, whooper swan, tufted duck, long-tail duck, and great crested grebe.
    - According to the applicable Standard Data Form (SDF) for the PLB220005 Zatoka Pucka area, the objects of protection within this area are, among the bird species observed - scoter, cormorant, great crested grebe (wintering and passerine populations) and European herring gull (breeding population) and tufted duck.
    - During the surveys conducted in 2015-2016, the heterogeneous occurrence of birds within the harbour was revealed. During the work, 6,710 wetland birds were recorded in the area of direct impact of the project out of 157,459 individuals found in the inventoried area of Port Północny. This represents only 4% of all birds recorded within Port Północny.
    - The following pressures on avifauna will occur during the construction phase and may affect species that are protected in the Natura 2000 area:
        - eliminating the availability of foraging habitat and resting areas in the nearshore portion of the marine basin;
        - possibility of disturbing birds in the area of investment as a result of construction works.

- During the exploitation phase, two main factors are expected to cause pressure on species protected within the SPA "Puck Bay":
    - the disturbance of migratory and wintering birds stopping over in the area of the planned terminal;
    - disturbing and frightening nesting birds on the harbour piers - including the ore pier.
- Taking into account the small number of bird groups within the area of direct impact of the investment, as well as the low importance of the area both within Port Północny itself and the Natura 2000 area, no negative impact of the investment on the objects of protection is predicted. The planned investment at the construction stage will not have a significant negative impact on breeding avifauna as well as migrating and wintering birds within the Gulf of Gdańsk. They are characterized by high mobility and plasticity in their use of sites that provide optimal resting and foraging conditions. The potential for adverse impacts during the operational phase on both breeding birds and birds using coastal marine areas for migration and wintering is also not anticipated. The impact of the planned project both at the stage of construction and operation on the seasonal migration routes of birds is likely to be negligible or unnoticeable. Larger bird species (e.g., geese, cranes) traveling at higher altitudes will not change flight directions as they do over urban areas. Smaller low-level migratory species will fly over the terminal, as they currently do over other parts of the port, or will modify their route slightly by avoiding the terminal and maintaining overflight of undeveloped areas.
- The project will also not have a negative impact on the population of the cormorant (the most numerous species found in the immediate vicinity of the investment and being the subject of protection of the area). These birds are obligate ichthyophagous, feeding on small fish, the impact of the project on these birds will be minimal and limited to periodic disturbance from roosting sites. Impacts to the food base will be negligible, as cormorants tend to feed on pelagic fish and these will only change their habitat as a result of the works. The quality of habitat used for resting by birds will not be diminished as a result of the investment works as well as during the operational phase. There is also no predicted negative impact of the planned project on the population of the European herring gull, which is not exposed to negative impacts as it is not a bird that dives in search of food.
- Potential negative impacts on the cormorant (in the form of temporary disturbance of birds) may affect the fraction of birds using the harbour basins for resting during the breeding and wintering period, although as shown in the studies, the investment area is not among the harbour basins occupied by birds in large numbers. Species subject to minor short-term impacts during the development phase include: great crested grebe, mute swan, merganser and long-tailed duck. The predicted minor adverse impact will, however, affect a very small area of water at Pier T3 (dredging period) and an equally insignificant area of dredging and enlargement works and will require short-term movement of birds away from the works area.
- Impacts could also potentially affect nesting birds nesting in the Port (gulls, terns) through potential disturbance. However, in the case of gulls, the birds are nesting at a safe distance from the planned works (currently about 15 pairs on the island breakwater) and the future terminal site. Terns, as shown by the experience of previous years when works were carried out during the breeding season in the immediate

vicinity of the colony (repair of the Ore Pier, dredging of the harbour basin, implementation of T 2) are surprisingly plastic and insensitive to such works. Conducting similar work in previous years at distances many times less than those planned for this project did not adversely affect the nesting colony (both settlement and nesting success and survival of chicks). Therefore, predicting a negative impact on tern populations in the area is not warranted.

- During construction works, mooring of vessels at breakwaters in April-July should be minimized to avoid loss of nesting birds (European herring gull and possible nesting tern after the completion of the nesting platform for this species).
- Other bird species of conservation concern (listed in the site SDF) will clearly not be significantly affected by the project.
- In connection with the planned investment, a part of the area will be flooded, which is potentially a feeding ground for a number of species. However, taking into account the small size of the occupied area compared to the PLB 220005 Bay of Puck, the loss of the seabed, as well as the low usage of the area by benthic species, the impact of the project on the loss of feeding habitats should be considered insignificant.
- The dredged material obtained in the process of dredging the harbour basin will be stored on silting fields (dumping site) in the depth of the Gulf of Gdańsk. These areas are now regularly used to store spoil from current or planned developments. Despite the finding of high benthic densities in the deposition sites, it should be expected that due to the maintenance works (deepening of the harbour basins of Port Północny as well as the currently implemented investments related to the construction of breakwaters and the approach fairway including the steering wheel), the excavated material deposited as part of the analysed investment will not cause a direct loss of potential bird feeding sites due to their disappearance in connection with the procedure of other investments in the area.

9. Due to the distance of the works from the marine mammal sanctuaries that are the subject of protection of the SAC (more than 10 km) as well as the small spatial extent of the project impact, the probability of negative impacts on the coherence and integrity of Natura 2000 network and deterioration of marine mammal habitats should be considered unlikely. Potential disruptions to the natural behaviour of marine mammals may be associated with noise emissions during project construction. Potential impacts will be local and short-term, limited to the area and duration of the reefing and pier landing activities. Once the work has ceased, and the noise disturbance has subsided, the situation will return to what it was before the work began.

- Analysing the impact on the SAC protection objectives, i.e. the grey seal Halichoerus grypus and the harbour porpoise Phocoena phocoena , it can be assumed that due to the shy character of these animals (and in case of the harbour porpoise - low probability of swimming) they will probably avoid places where works will be carried out during the construction phase. So far, no regular and numerous presence of marine mammals has been recorded in the immediate vicinity of the investment area. The area does not stand out (in terms of number of seal findings) from other areas under anthropogenic and industrial pressure within the Gulf of Gdańsk

10. In the survey fisheries conducted in the vicinity of the project, 18 fish species were found, of which four (cod, flounder, herring and sprat) are of industrial importance. Two species of

protected fish (twait shad, shortnose sturgeon) have also been recorded. Flounder was the clear dominant fish in all zones. In the zone closest to the shore and harbour fortifications, freshwater species associated with the Vistula estuary (chert, perch, zander) were found.

- Due to the local, limited nature of the impact of the investment on the marine environment, there are no grounds to assume that the execution of the investment will have a significant negative impact on the conservation status of any of the fish species listed above.
- In the case of the freshwater species bitterling, weatherfish and asp, impacts were excluded at both the investment and operation stages due to the low probability of occurrence of the species in the project area.
- In the case of the ziege, taking into account the location of the project in question, its area coverage, distance from the habitats of the aforementioned species and the fact that they spawn in the upper sections of rivers with strong currents, there are no grounds to assume that the implementation of the project may adversely affect both the conservation status of the species and the status of its natural important habitats.

11. In relation to the area used by birds, there will be no significant impact on the integrity of the Natura 2000 site, i.e. there will be no loss, fragmentation or availability of important elements of the species' habitats i.e. breeding sites, feeding sites or resting places. The project will not interrupt the patency of ecological corridors used by birds and will not permanently disturb the dynamics of migration of species being the targets of protection. Short-term intensity and interaction of some factors may adversely affect the integrity of the area for short periods of time. This applies to ecological conditions (understood as physical and chemical parameters of water), which locally and temporarily may be deteriorated, which in turn may affect feeding conditions in a relatively small part of the basin, or the need to move to other areas during the construction phase as a result of disturbance.

12. Both during construction and operation, there will be no permanent and significant impact on the coherence of the Natura 2000 network understood as the preservation of the same number and quality of species present in the area prior to the project, as well as their correct geographical distribution in relation to the range of their occurrence, including the connectivity between individual areas within the network. The function of the area and the role it plays in the Baltic coastal bird area network will not be lost. After the analysis of the influence on particular refuge objects, the influence on the level of proper conservation status of particular species being the target of protection is not diagnosed.

13. The project will also not result in deterioration of the species' favourable conservation status according to indicators of favourable conservation status for breeding species targeted for protection in the PLB220005 area.

14. The landfall area of the planned project, located approximately 300 m south of the eastern part of the planned T3 terminal, is of key importance as an area of mitigation associated with the previous expansion of the DCT with a T2 terminal. The mitigation activities at the beach and its facilities are carried out here in accordance with the decision of RDOŚ-Gd-WOO.4211.29.2013.AT.9 dated March 28, 2014. The planned works will be carried out more than 300 m from the shore, and therefore will not adversely affect breeding birds, including

the breeding population of the ringed plover, as well as species potentially breeding in the area - the least tern, the common shelduck and the merganser.

The following phenomena are expected to occur at the stage of project operation in the shore area of the post-investment mitigation measures: decrease in wave power; increase in accumulation of beach sediments, including organic material - wreck line; development of wreck line communities. This will be due to the significant wave protection of this section of shoreline by the wharf structure of the planned terminal. Changes associated with shoreline growth on the east side of Terminal T 1 and increased accumulation of wreck line are already being observed and have been noted, among other things, in reports on the effectiveness of ongoing mitigation efforts. These phenomena are assessed as positive for least terns and ringed plovers. wreck line, which may appear on shore in greater numbers, provide a foraging base for plovers as an insect habitat. It will also provide a foraging base for other bird species to which mitigation is not dedicated. However, care must be taken to prevent the growth of plants on the beach (especially willow and reed), whose competitiveness may increase as a result of increased accumulation of organic matter in the coastal zone.

15. The planned project will not pose a threat to the achievement of environmental objectives set for the transitional water body Inner Gulf of Gdańsk with the code PL TW IV WB4. This applies to both the construction phase and the operation phase.

    Based on the assessment of the impact on the environmental objectives set for the protected areas of the Inner Gulf of Gdańsk transitional water body, the planned project is not expected to affect the possibility of maintaining or reaching a proper conservation status of the species and habitats protected in the PLB0005 Zatoka Pucka and PLH220105 Klify i Rafy Ramienne Orłowa areas.

16. Based on the flood hazard maps and flood risk maps it can be concluded that the project area is not located in a flood risk zone, as the maximum predicted sea level in this area for a flood situation with probability of 0.2% is estimated at 2.5 m, and the terminal pier's ordinate is 3.0 m and has been set at this level also due to long-term predictions of sea level and storm surges.

17. The discharge of pollutants into the air associated with the operation of the new terminal and the entire DCT Gdańsk S.A. facility will not cause the conditions set forth in the regulations to be exceeded (reference values and limit values for substances in the air) - the emission of dust and gas pollutants into the air will not cause the air quality standards to be exceeded outside the facility.

    Emissions from DCT will be primarily fugitive in nature, coming primarily from the movement of vessels and diesel-powered container handling equipment and machinery. In the case of the planned project it is foreseen to use entirely electrically powered overhead cranes, from which emissions will only occur in case of power failure and the need to run the generators installed on them.

18. The project will not have a significant impact on global climate change. The main source of greenhouse gas emissions will be the combustion of fuels (diesel) in the engines of means of transport and working machinery and vessels during the implementation and operation of the planned investment.

- The basic principle limiting the emission of greenhouse gases and thus reducing the impact of the planned investment on the climate will be the use of technically efficient machinery, equipment and vehicles with current technical inspections and the rational use of fuels (diesel oil). These actions can have the effect of reducing emissions and thus can minimize the project's impact on climate change. As part of the planned project, in order to reduce emissions of greenhouse gases, it is planned to install electric-powered cranes and construction of electric connections at the quays, as well as powering of vehicles with gas engines (LNG, LPG, CNG).
- The emissions associated with the construction and operation of the terminal will be negligible in the context of global warming and climate change.

19. Within the harbour waters during the construction period, due to dredging operations, there will be a periodic increase in the concentration of nutrients, suspended solids, and a decrease in water transparency. Spills of oil or other harmful chemicals can be the most serious threat, with local coverage. Adherence to technological regimes and the use of efficient equipment will minimize the risk of pollution of the water body. Impacts during the operational phase will be of minor significance on marine waters from rainwater discharged after treatment into harbour waters.

    - Stormwater will be discharged to harbour waters through no more than 35 outlets located in the wharf, breakwater, or other shoreline structures. Outlets will be spaced appropriately in relation to the catchments from which rainwater is collected. Outlet diameters will be tailored to the specific design of the sewer network. Treated rainwater, meeting the quality requirements, discharged to harbour waters from the DCT Terminal area will not cause any negative impact on the water environment, as rainwater flowing to the marine environment is a natural process occurring in nature and the solutions applied in the existing Terminal and planned to be applied in the new Terminal practically do not interfere with this process.
    - The direct vicinity of the sea makes the discharge of rainwater not a technical problem, but only requires the proper selection of sewer network elements, the adoption of appropriate pipe dimensions, good gradients (or the adoption of a pressure system) and appropriate purification devices. These are basically already just technical issues with little environmental significance. The creation of T 3 may require reconstruction of the storm drain system at the T 1 terminal.

20. Assessing the acoustic field created by the operation of handling equipment and means of transport as well as the values of noise levels at the borders of the Terminal and at observation points located in protected areas, it can be concluded that the DCT Container Terminal is unobtrusive in terms of noise emission to the environment. Analyzing the shares of individual noise sources, it can be seen that the largest share of noise emissions is from truck transport and containers equipped with chiller units. The values of noise levels predicted at the elevations of residential buildings and at the beach of the Stogi bathing site are lower than the permissible levels of noise in the environment accepted for assessment both during the day and at night. The acoustic analysis shows that in areas subject to acoustic protection, i.e. multifamily residential developments located at a distance of approximately 2000 m from the border of DCT, the impact of noise from the Terminal Site will be negligible and will not have any impact on the acoustic climate in the vicinity of residential buildings, both during the day and at night.

- Noise impacts during the construction phase of the proposed project are temporary and transient in nature. Construction of new facilities and installation of equipment will be associated with periodic noise emissions, the magnitude of which will be determined by the intensity of the work and the location of the work. Noise nuisance during construction will not be harmful to the environment or people in the areas adjacent to the Terminal due to the fact that it is far away from areas that are acoustically protected around the clock, i.e. the residential development of Stogi district. It should be noted that the area acoustically protected as a recreational and leisure area is also the area of Stogi beach and bathing site.
- Periodic increases in noise emissions may occur during specific construction activities such as piling of the site. Construction equipment must meet the requirements set out in Directive 2000/14/EC and the Regulation of the Minister of Economy of 21 December 2005 on the essential requirements for equipment used outdoors in terms of noise emission into the environment. The permissible sound power level (LAW) of equipment intended for operation, according to the appendix to the Regulation of the Minister of Economy of February 15, 2006 amending the Regulation on the essential requirements for equipment used outdoors with regard to the emission of noise to the environment, cannot exceed the sound power value LAW =105 dB.
- The noise level emitted during the operation of the dredgers will not exceed LA = 90 dB, and due to the significant remoteness of the acoustically protected areas from the reservoir, which will be subject to dredging, excessive noise emission is not expected to enter the residential areas of the multi-family district of Stogi. Consideration should be given to noise emissions to the beach and bathing site. It may be a good idea to conduct dredging of the basin adjacent to Terminal T 3 outside the summer season in the spring, fall, and winter.

21. The planned dredging-replenishment works do not require any precautionary measures or shielding that would need to be incorporated in the design if a mechanical backfill suction dredger is used for the works and the speed of the dredger does not exceed 1 knot (this speed also applies to the movement of the scarps disposing of the spoil on the spillway in order to enable an even distribution of the spoil on the seabed in the spillway area). Since other types of dredgers are better suited for certain activities - the possibility of using other dredgers for these purposes should not be excluded, e.g. grab dredgers for bottom levelling, but in this case grab dredgers with tight clamps to reduce turbidity should be used.

- When discharging dredged material on a dumping site, the position of the dump barge should be controlled by navigational or other devices that determine the vessel's position to ensure that the discharge is in the correct location. Besides, underwater currents and the speed of the vessel's movement should be taken into account when discharging the dredged material into the spillway, so that the suspended solids generated during the discharge are formed in the spillway area.
- The results of the sediment cleanliness studies in the area of the port of Gdańsk and in the vicinity of the operating Terminal and the planned investment allow to assume that the dredged material coming from the area of the required dredging will not be contaminated. Prior to dredging, the dredging contractor should carry out reconnaissance and testing to determine whether the provisions of the Waste Act apply to the dredged material, applying in this case the provisions of the Regulation of the Minister of Environment of 23 September 2016 on the detailed conditions for

considering hazardous waste as non-hazardous waste. In the implementation of the first stage of the procedure described in the aforementioned regulation, the guidelines presented by the Helsinki Commission should be followed: "HELCOM Guidelines for the Disposal of Dredged Material at Sea.

- The volume of dredging works within the planned project was estimated at 4 million $m^{3.}$ According to the reconnaissance, which results from the information available for the projects planned to be executed in the area of the said project, 50-60% of this volume (2-2.4 million m^3) consists of silts requiring storage on the maritime flapjack, and 40-50% of sands (1.6-2 million m^3) suitable for use in flooding of the sea basin. On the other hand, flooding of 95 ha of the sea basin will require filling of approx. 10 million m^3 with earth and rock masses, construction materials, reinforcing elements, etc. Depending on the lithology and purity of the bottom sediments, an appropriate option of storing the excavated material will be selected, either at the maritime dumping site indicated by the Maritime Office in Gdynia or for filling the space to be flooded within the area of the planned project.
- In terms of ichthyofauna, the greatest potential impact has been diagnosed during construction and dredging of the harbour basin. This action could disrupt the migration of herring and sprat within the harbour area and adversely affect spawning. Bottom dredging will cause water turbidity and deterioration of physical and chemical conditions, including oxygen conditions, which may act as a barrier to fish movement. Also, the increased noise and vibration resulting from equipment operation and barge traffic will result in fish deterrence. Concentration of works may cause short-term isolation of the western eastern part of the area. This could disrupt fish spawning migrations and the dispersal of juvenile fish to habitats located in the rest of the basin. This impact can be mitigated by the method of dredging i.e. no dredging during April-June and taking measures to reduce the spread of suspended solids (scour runoff).

22. Waste management during the construction phase will include typical construction site-related process wastes, including earth masses and municipal wastes. It is not anticipated that the dredged material from the basin would have hazardous waste characteristics and would therefore need to be treated as waste.

    Waste management to be conducted at the terminal in the exploitation phase after expansion will refer to the same technological processes and the same types of waste as in the case of the already operating terminal, and only the amounts of waste generated will increase, which will not affect the possibility of conducting proper waste management.

23. Emergency events associated with the construction and operation of the T 3 Container Terminal may include various types of accidents and resulting effects involving transportation and handling equipment. For the most part, other than endangering the health and lives of service workers, they will not cause environmental hazards. In the event of a hazardous cargo container unsealing, appropriate technical equipment and handling procedures will enable the released cargo to be neutralized and isolated from the environment.

    - During construction or operation of the DCT terminal, the following situations may occur, which have the character of failures or other hazards with possible negative effects on the environment: fires, explosions and related emissions and the impact of fire effluents on water reservoirs, leaks to soil and water / emissions to the atmosphere of chemicals, failures of devices protecting or reducing the discharge of pollutants to the environment, disruptions in the supply of water, electricity, gas and other media, hazards associated with the surrounding fauna and flora, other uncontrolled releases of energy and substances.

- In order to minimize the risk of failure at the development stage,:
  - conduct dredging operations in the harbour channel area in favourable weather conditions;
  - arrange the construction site facilities taking into account the nature of the ground and possible safeguards to be used;
  - use technically efficient construction equipment;
  - have chemical agents (sorbents) to neutralize possible spills from construction equipment and thus minimize the possibility of ground contamination.
- These events may be the result of a collision between a ship and a quay or a ship and a ship, they may be caused by the impact of a container due to the above or other events - in which case fuel or the contents of the containers may leak out, the quay may also be damaged, in extreme cases the crane may be damaged/turned over, etc. Events that may result in fire may also be caused by the work of subcontractors, e.g. by improper performance of fire hazardous work. Flooding is also a natural hazard that could threaten the terminal, and during the construction phase a special hazard is posed by the potential presence of military explosives on or under the seabed. The terminal is not subject to major accident regulations because hazardous substances that are stored at the terminal are here in a transport mode and are subject to regulations related to the movement of hazardous materials by water, road and rail (IMDG, ADR, RID).
- Procedures and instructions as well as other internal documents describing how to prevent accidents, prepare for possible accidents and respond to accidents are elements of the site's management - also as part of the environmental management system compliant with the requirements of Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organizations in a Community eco-management and audit scheme (EMAS). Therefore, they are subject to periodic internal and external audits and the general principle of continuous improvement, which means that they are subject to modification, adaptation to needs, increasing their characteristics, effectiveness and practicality.
- The Port of Gdańsk operates, as an element of the national system, a system for combating threats and pollution at sea, the detailed organization of which on a national scale is defined by the Regulation of the Council of Ministers of 8 August 2017 on the manner of organization of combating threats and pollution at sea (Dz.U. 2017, item 1631). In the Port of Gdańsk all activities related to counteracting hazards and pollution in the Port are conducted on the basis of "The Plan for Combating Hazards and Pollution in Port Waters Managed by the Port of Gdańsk Authority S.A." approved by the Director of the Maritime Office in Gdynia with the decision no. 8201/5/04 dated 02.12.2004. The Plan was updated in April 2012 and approved by the Director of Maritime Office in Gdynia with the decision no. 076/46/12 dated 22.06.2012. In DCT there is in force "Plan of combating hazards and pollution of waters in the port basin (DCT/DOC/SC/27.04)", which is a part of the plan.
- DCT also operates an internal environmental management system verified to EMAS requirements. The system will cover the activities on T 3 - appropriate emergency

prevention, emergency preparedness and emergency response procedures will be developed and implemented.

24. The area of the planned project is located beyond the cultural objects identified so far lying on the seabed. According to the results of research carried out in the vicinity of the project, the Port of Gdańsk area is a rich archaeological basin of the Polish Baltic coast. Taking into account a significant area occupied by the planned investment (over 130 ha), one can therefore expect the occurrence of archaeological monuments. Therefore, appropriate preventive measures should be taken to preserve them:

- Prior to construction and dredging activities, sonar soundings should be conducted to identify any cultural objects present on the seabed within the project area.
- Notwithstanding this, all bottom intervention works, including dredging, should be carried out under archaeological supervision.

25. The following landscape units can be distinguished in the terrestrial surroundings of the planned project:

    - a complex of berths, equipment and port buildings of Port Północny (including the existing DCT) - directly adjacent to the investment area from the southern and western side;
    - dune shore landscape, with beach, white and gray dune shafts, and a strip of pine forest on the dunes - extending east and southeast approximately 350 to 500 m from the planned T3 terminal pier.

- The port complex of Port Północny forms a zone of an outstanding industrial and industrial-storage landscape, strongly transformed, with a complete lack of natural elements. At the same time, some of the elements of the existing DCT, such as large cranes and port gantries, are strong landscape dominants, enhancing the impression of a strong transformation of the physiognomy of the seaside landscape, especially in the absence of other, natural height elements, which constitute the cover. On the other hand, the terrestrial hinterland in the dune landscape zone has a distinctly different character. It has preserved natural features, there are no significant anthropogenic transformations, and the existing and visible elements of tourist and recreational buildings (rescue base and medical point) at the main entrance to Stogi beach have preserved proportions and dimensions, fitting it well into the surroundings of the beach strip and dunes. This part of the coastline can be regarded as a well-preserved fragment of the typical dune coastal zone of the Gulf of Gdańsk with high landscape values. An important element of the cultural landscape in the area of Stogi Island is the panorama of the sea, especially in the zone used for recreation. The development of Port Północny, and in particular the DCT Sea Container Terminal, has significantly changed the landscape of the analysed part of the Stogi Island coastline. In place of the beach and wooded dunes and part of the reservoir, wharves and storage yards and cubic objects were built, as well as communication infrastructure (access road, internal roads and railroad track). Currently, the view opening from Stogi to the sea in the northwest direction is dominated by elements of the industrial and infrastructural landscape of the existing DCT berth. Specific, highly visible features include a loading quay, moored container ships, cranes, and storage yards.
- Regardless of the construction method, it should be assumed that there will be an impact on the landscape values mainly due to: a) works related to dredging and artificial

flooding of up to 95 ha of the sea area, b) establishment and operation of temporary construction technological elements, e.g. dredgers, pile-driving machines, c) introduction of new hydrotechnical infrastructure in the form of an artificial pier in the existing fragment of the sea area of the Gulf of Gdańsk. Some of these activities, strictly related to construction works, will be of short-term and transitory nature, but in the end, after completion of the construction works, the berth with the Terminal infrastructure will constitute a new, completely artificial, anthropogenic fragment of the sea coast, constituting a strong dominant feature in the landscape. From the standpoint of the aesthetics of the eminently indrustrial port landscape, the planned DCT expansion will not worsen the status quo. This project fits within the intent and strategies of the development while preserving the land areas in the neighborhood without change. However, the implementation of the project will further increase the area occupied by this type of anthropogenic landscape and the creation of new specific waterfront landforms (,). At the same time, the container terminal is an element unambiguously identified with the port function, which is an important function of the city of Gdańsk and determines its identity. For certain segments of the population, a rapidly growing container terminal whose operations involve the presence of large, modern vessels can be seen as an attractive form of industrial landscape.

26. The impact of the planned investment on the living conditions of the residents of Stogi, taking into account the predicted condition of the environment in the places of permanent residence as well as within the recreational areas, should be considered insignificant. No exceedances of acceptable environmental quality standards will occur in these areas. It should be noted, however, that in the case of the analysed project the impact on the recreational conditions of people should be considered also from the point of view of close proximity of a large industrial facility, which affects the negative perception of the recreational landscape, regardless of the actual state of the quality of its components (acoustic climate, air pollution, water purity). The close proximity of the port quays, reloading facilities, the movement of large container ships, as well as the noise and air pollution emitted (despite maintaining acceptable standards) may have a subjective impact on people's recreational conditions and perception of the attractiveness of the seaside recreational space.

27. The nearest residential development is located approximately 1.7 km south of the planned project in the Stogi district, in the area of Pusty Staw. Much closer are the recreational use areas. Such include:
    - the designated bathing site in Stogi - is located approximately 610 m from the quay of the planned terminal (approximately 330 m from the area of the planned dredging works),
    - Stogi sea beach - the nearest beach entrance with seasonal facilities (trash garbage cans, etc.) is about 670 m from the planned pier, while the strip of beach currently used for recreation is at a minimum distance of about 430 m from the edge of the planned terminal and about 340 m from the dredging area
    - recreation areas in the area of Stogi - the nearest existing ones are located at a distance of approx. 850 m from the terminal and respectively approx. 720 m from the dredging site.

28. Potentially, the social conflict that emerged in 2018 in the context of the Stogi Sea Bathing site and the Stogi Beach, during the works on the draft Study of Conditions and Directions for Spatial Development of the City of Gdańsk, may be extended to the planned terminal expansion project. The conflict was over the designation of land adjacent to the marine bathing site for port functions. The Study, providing for such a direction of development, was adopted by Resolution No. LI/1506/18 of the Gdańsk City Council of April 23, 2018.

    The above conflict concerned the land areas covered by the provisions of the Study. The planned project will be entirely implemented in marine waters and within the boundaries of the Port of Gdańsk, therefore it can be assumed that the implementation of the project will not significantly escalate the existing conflict. This conflict may also be alleviated by an appropriate information policy regarding the extension of DCT, emphasizing the spatial scope of the project, drawing attention to the importance of the development of maritime economy and the unique role played by DCT in the Port of Gdańsk and the Polish economy in general.

29. The marine area in the vicinity of the DCT should be considered as potentially threatened by the presence of explosive objects of military origin. It is therefore recommended that procedures and techniques are employed to search for and clear the munitions from the project area.

30. There is no need to establish additional investment or post-investment monitoring for any of the animal groups found within the impact range of the project.

    - Continuous archaeological supervision should be provided during dredging operations.
    - Once Terminal T 3 is in operation, noise measurements should be conducted to determine the actual range of acoustic impact and to compare the calculated equivalent sound level A with the actual noise impact on the eastern, northern, southern and western boundaries of the plant and towards the nearest residential buildings in the Stogi district, as well as at the Stogi beach and bathing site. Noise measurements should be made during the day and night on the main directions of noise propagation from the DCT area.

31. Notwithstanding the other identified mitigation measures, it is recommended that additional recommendations be adopted in the environmental decision as follows:

    - The construction site shall have designated, paved and drained areas for material and product storage and waste storage;
    - Cars leaving the site shall be cleaned to protect public roads; for this purpose, a separate stand or temporary washing facilities shall be designated on the site and equipped with suitable washing facilities or otherwise provided to meet this condition.
    - Waste generated during the execution of the project should be collected selectively and stored in a designated place, inaccessible to third parties, in sealed and labelled containers appropriate for the type of waste, in a manner that does not reduce the suitability of the waste for further, assumed waste recovery or disposal processes.
    - Temporary access roads shall be constructed as drainable, demountable and with non-polluting elements.
    - The construction project should design ways to deal with uncontaminated earth masses displaced in connection with dredging of the approach fairway and seawater infilling.

32. Having analysed the scope of the planned project and having identified its environmental impacts and their scale in this environmental impact report, it should be concluded that the planned project will not cause a cross-border environmental impact.

17 Literature and resources

17.1 Set 1

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18 Appendices

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	Emitter parameters at the Terminal - operational phase	Zal_08.4-3_Powietrze_EKSPLOATACJA_Parametry emitorów na terenie Terminalu DCT etap eksploatacji.pdf
	Results of calculations of air pollutant concentrations in the receptor network - GRAPHIC	Zal_08.4-3_Powietrze_EKSPLOATACJA_Izolinie-eksploatacja.pdf
	Results of calculations of air concentrations of pollutants in the receptor network - TABULOGRAMS (electronic version only)	Zal_08.4-3_Powietrze_EKSPLOATACJA_Tabulogramy_TYLKO_ELEKTRONICZNIE.pdf
Appendix 8.5-1:	Acoustic field image common for daytime and nighttime	Zal_08.5-1_HALAS_Terminal_T3_skalowany_do_A3.PDF
	Results of acoustic analysis at observation points (electronic version only)	Zal_08.5-1_HALAS_Wyniki_punkty_obserwacji_Terminal_T3_TYLKO_ELEKTRONICZNIE.pdf
	Input data - noise sources (electronic version only)	Zal_08.5-1_HALAS_Źródła_hałasu_Terminal_T3_TYLKO_ELEKTRONICZNIE.pdf

Appendix 8.12-1:	Decision of the Marshal of Pomeranian Voivodeship, DROŚ-SO.7243.8.2007.EŻ, dated 7.4.2017 on the permission to produce waste resulting from the operation of the installation	Zal_08.812-1_Odpady_DROŚ-SO.7243.8.2017.EŻ_pozw_na_wytw_odpadow.pdf
Appendix 8.13-1:	Safety Data Sheet of the Inner Gdańsk Bay surface water bodies IVWB4	Zal_08.813–1_JCWP__Zał 1a. Karta charakterystki JCWP Zat. Gdańska WewnętrznaTWIVWB4.pdf
Appendix 9-1:	Internal procedure "DCT/SOP/OPS/1.11 Handling of IMDG Dangerous Goods"	Zal_09_1_DCT_SOP_OPS_1.11-OBSŁUGA-ŁADUNKÓW-NIEBEZPIECZNYCH-IMDG.pdf
Appendix 9-2:	"Port Basin Water Hazard and Pollution Control Plan (DCT/DOC/SC/27.04)"	Zal_09_2_DCT_DOC_SC_27.04_Plan zwalczania zagrożeń i zanieczyszczeń wód basenu po....pdf