

**REGIONAL DIRECTOR FOR  
ENVIRONMENTAL PROTECTION  
IN CRACOW**

OO.420.4.2.2018.BM

Cracow, 1 February 2019

**DECISION  
ON MODIFICATION OF DECISION  
ON ENVIRONMENTAL CONDITIONS  
DATED 01/27/2017, REF. NO.: OO.4233.4.2016.BM**

Based upon Article 104, Article 107 (1), Article 108, and Article 155 and Article 49 (1) of the Act of 14 June 1960 Administrative Proceeding Code (OJ of 2018, item 2096, as amended), and also based upon Article 87 in reference to Article 63, Article 71 (2) item 2, Article 74 (1) and (3), Article 75 (1) item 1 letter i), and Article 75 (1) item 1 letter p), as well as Article 75 (1) item 1a, and Article 84 and Article 85 (2) item 2 of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments (OJ of 2018, item 2081, as amended), and based upon Article 17 of the Act of 8 July 2010 on the special preparation rules for flood protection investments (OJ of 2018, item 433, consolidated text), as well as Article 3 (1) items 60 and 65 of the regulation of the Council of Ministers of 9 November 2010 on the investments which may significantly affect the environment (OJ of 2016, item 71, consolidated text),

**after considering**

the application dated 05/07/2018 (reception date: 05/10/2018), ref. no.: KR.JRP.081.8.11.2018, as provided by the Investor, i.e. State Water Holding Polish Waters Regional Water Management Authority in Cracow, 22. Marszałka J. Piłsudskiego Street, 31-109 Cracow, represented by Mr. Radosław Radoń – Manager of the Odra-Vistula Flood Management Project Implementation Office at the Regional Water management Authority in Cracow, supplemented with formal parts with notes: dated 06/06/2018 (reception date: 06/07/2018), ref. no.: KR.JRP.081.8.11.2018; dated 06/27/2018 (reception date: 06/27/2018), ref. no.: KR.JRP.081.8.11.2018; dated 07/05/2018 (reception date: 07/06/2018), ref. no.: KR.JRP.081.8.11.2018; and dated 07/13/2018 (reception date: 07/16/2018), ref. no.: HTK/AD/1500/1310/18; and supplemented with substantial parts related to the IDS with notes: dated 09/17/2018 (reception date: 09/17/2018), ref. no.: HTK/AD/15008/1627/18; dated 11/09/2018 (reception date: 11/09/2018), ref. no.: HTK/AD/15008/1932/18; and dated 12/07/2018 (reception date: 12/20/2018), ref. no.: HTK/AD/15008/2067/18; updated with clarifications submitted by e-mail on 12/20/2018, ***on modification of a decision on environmental conditions issued by the Regional Director for Environmental Protection in Cracow dated 01/27/2017, ref. no.: OO.4233.4.2016.BM for the investment titled: "Completion of the rehabilitation of the flood embankments of the Vistula River in Kraków: Section 1- the left embankment of the Vistula from the Wanda bridge to the Przewóz barrage, together with the backwater embankments of the Dłubnia River; Section 2 - the left embankment of the Vistula from the Przewóz barrage to Suchy Jar"***, in the following scope:

- Modification of chainage provided, including division of the investment into tasks and a scale of embankment raising;
- Implementation of additional data on the area of properties or their parts, which would remain a part of the investment, and are necessary for its implementation, and which become properties of the State Treasury;
- Implementation of additional plots under impact, which is associated with inclusion of a ditch discharging water from embankment lock no. P.2.3 at chainage km 2+813 in the decision;
- Modification of chainage for deposits;
- Implementation of a provision on possible shaping of the embankment slope to the value of 1:1.5;
- Modification of chainage provided for particular types of typical embankment sections;
- Modification of provisions related to descend roads and embankment crossings in the scope of names of works, as result from the construction law and from the description of descend roads' courses, as agreed with ZIKiT;
- Inclusion of information associated with desilting of a ditch discharging water from embankment lock at chainage km 2+813 (in section 2), i.e. in a reach from the lock to the estuary to Vistula – it shall be desilted over a length of about 330 m, and its cross-section shall be restored;
- Implementation of corrective data for breaks in a shield underneath of road bodies and culverts of MPWiK, where the culvert construction provides tightness for the embankment and for the subbase;
- Modification of provisions for protected areas, including protection zones of water-intakes and for protected areas of in-land water reservoirs;

**after obtaining an opinion of the**

State District Sanitary Inspector in Cracow of 11/27/2018 (reception date: 11/29/2018), ref. no.: NZ-PG-420-339/18 ZL/2018/11/355, and of the Minister of Maritime Affairs and Inland Navigation dated 12/21/2018 (reception date: 12/21/2018), ref. no.: DOK.DOK2.9750.14.2018.SL PW:69432,

**I hereby decide as follows:**

I. I state that it is not necessary to perform an environmental impact assessment for the subject modification of the decision on environmental conditions.

II. I modify the decision of the Regional Director for Environmental Protection in Cracow on environmental conditions dated **01/27/2017**, ref. no.: **OO.4233.4.2016.BM**, as follows:

**In the conclusion:**

1. I modify item 2 of the environmental decision dated 01/27/2017, ref. no.: OO.4233.4.2016.BM, in reference to characteristics of the investment, and provide new contents titled **“Appendix no. 1 – New Characteristics of the Investment”**, which forms an integral part of the modified decision.

**In the justification:**

**2. Item 1a. “Type and character of the investment including the following:”**

a) *“Scale of the investment and size of acquired land, and their mutual proportions, as well as significant solutions specific for the investment.”*

**gains the following new meaning:**

The planned investment comprises the redevelopment and extension of about 10 km long section of embankments for the River Vistula, including backwater embankments at the River Dłubnia, except for the short section of the final reach of the embankment.

Except for the redevelopment and extension of embankments for the River Vistula, including backwater embankments at the River Dłubnia, the scope of application also covers redevelopment, protection or liquidation of the related accompanying infrastructure (embankment locks, descend roads and embankment crossings, and service roads), and construction, redevelopment, protection or liquidation of the existing road infrastructure (roads, culverts, ramps – descend roads and embankment crossings), power network, gas network, IT network, water supply network and sewerage network.

The planned investment shall be implemented in accordance with the requirements of the regulation of the Minister of Environment of 04/20/2007 *on the technical conditions for hydraulic structures and their location*, with required safe freeboard for hydraulic structures as in Class I, with deviation related to determination of design flow and control flow in reference to Q1% and Q0.2%, respectively, without estimation mistake. The deviation from technical and engineering regulations for that section of embankments is a result of continuation of gradeline for the embankments, based upon the same rules for the entire length within Cracow. A section between the Dębnicki Bridge and Wawel was a deciding factor for deviation from technical and engineering regulations and for lowering of the gradeline, due to the following reasons:

- Practically unrealistic implementation of extensive redevelopment of control network for bridges and access roads within the historic city center,
- Technical difficulties associated with extension of the existing embankments in the area of dense urban development, and especially extension of the existing stone walls located in a small distance from windows of buildings located e.g. along Kościuszki Street,
- Architectural and landscape reasons – necessary rising of the stone wall on the crest of the left embankment between the Dębnicki Bridge and Wawel, a height of which would need to reach not about 1.0 m, as it is now, but about 2.3 m or even about 4.0 m.

The same level of flood protection is continued within the current section.

The table given below provides chainage of the embankments covered by the investment, including corresponding working chainage.

Task	Register chainage km		Working km
	Embankment km	Respective river km	Embankment km
Section 1. Left embankment of the Vistula River (from the Wandy Bridge to the estuary of Dłubnia River)	87+600	87+900	0+000
	88+800	89+040	1+142
Section 1. Left embankment of the Vistula River (downstream of the estuary of Dłubnia River)	89+640	89+640	1+142
	90+560	90+550	2+097
Section 1. Left embankment of the Vistula River (downstream of the estuary of port channel)	90+638	90+640	2+097
	91+797	91+540	3+317
Section 1. Right embankment of the Dłubnia River	0+000	0+000	0+000
	1+832	2+373	1+830

Section 1. Left embankment of the Dłubnia River	0+000	0+000	0+000
	1+220	1+609	1+263
Section 2. Left embankment of the Vistula River (from the Przewóz Barrage to Suchy Jar)	91+997	91+990	0+000
	95+162	96+680	2+875

As it is not possible to raise and close the final section of the left embankment for the River Dłubnia at the existing route, the Investor decided about the following:

- Limitation of redevelopment and extension of that embankment at chainage from km 1+136 (river chainage km 1+577) to km 1+263 (river chainage km 1+609), i.e. up to the registered end of the embankment, including grading or total demolition of that reach of the embankment, which depends on obtaining the final consent from owners (private persons) of plots no. 358, 357, 354, area no. 46 – Nowa Huta;
- Development of a new closing embankment reaching the high bank (in the area of plots no. 510 and 624), covering all of the buildings, including those, which are currently located within the embanked area in a direct flood hazard area. The existing course of the embankment disables its rising and extension due to dense development; thus it is necessary to demolish a part of the embankment and to extend its remaining part beyond the developed area.  
A design for development of the new embankment shall be done based upon a separate investment task, for which an environmental decision has already been provided. The investor declares that both investments shall be implemented simultaneously, so the same level of flood protection would be provided.

The planned scale of rising for the embankments under the investment in question within particular sections:

- **Section 1** covers:
  1. Left embankment of Vistula from the Wandy Bridge to the estuary of the River Dłubnia – max. by about 0.5 m, about 0.3 m on average (embankment raising is not expected in a reach of embankments from km 0+000 to 0+985, but only development of a membrane at the embankment crest);
  2. Right embankment of Dłubnia from the estuary to the area of Ptaszyckiego Street - max. by about 1.2 m, about 0.75 m on average;
  3. Left embankment of Dłubnia from the estuary to the area of Bardosa Street - max. by about 1.2 m, about 0.65 m on average;
  4. Left embankment of Vistula from the estuary of Dłubnia to the Przewóz Barrage – max. by about 1.0 m, about 0.3 m on average.
- **Section 2** covers:
  - Left embankment of Vistula from the Przewóz Barrage to Suchy Jar - max. by about 1.2 m, about 0.75 m on average.

The subject investment is located within the Municipality of Cracow, on the left bank of the River Vistula.

**Section 1** begins at the Wandy Bridge, and then it overlaps Podbięty Street (Mogilski Forest joins it within that reach). Behind the lock, in the area of Zakarnie Street, Podbięty Street runs north on its own embankment. An independent flood embankment starts in that place. About 160 m further there is a registered beginning of the right backwater embankment of Dłubnia. It runs north and –

running parallel to the River Dłubnia – reaches the area of Ptaszyckiego Street. Length of the right backwater embankment is about 1814 m.

The left backwater embankment on the River Dłubnia reaches the area of Bardosa Street. It is significantly shorter than the right one and has a length of about 1220 m, and is divided into two parts (length of about 758 m and about 462 m) before the estuary channel of the Smelter. Similarly as in case of the right one, it runs parallel to the River Dłubnia. In a distance of about 500 m from its estuary it runs south-east and turns – in registry meaning – into the River Vistula embankment. Na Niwach Street runs along the embankment in that section. The embankment crosses the newly constructed embankment of S7 road, passes the Thermal Treatment Waste Plant, and runs parallel to the Vistula River and joins the embankments of the Przewóz port channel. That section is about 1116 m long. Register course of the further sections – running between the Vistula channel and embankments of sediment tanks of the Kujawy waste treatment plant, and ending in the area of the inlet to the upstream channel of the lock at the Przewóz Barrage – starts on the other bank of the channel. This section is about 1212 m long.

**Section 2** starts in the area of the downstream abutment of the lock, runs as a curve on the high bank of the Vistula flooding terrace, and then parallelly to the Vistula course, and ends – according to the register – at embankments of the Suchy Jar Stream. That section is about 2875 m long.

Currently the height of the flood embankment existing in **Section 1** is from about 2.6 m to about 4.8 m. Width of the crest in sections beyond the crossings is from about 2.0 to about 2.8 m. Grade of the riverside slope is from 1:2.15 to 1:2.32. Grade of the landside slope is from 1:1.8 to 1:1.9. The height of the flood embankment existing in **Section 2** is from about 2.8 m to about 4.0 m. Width of the crest in sections beyond the crossings is from about 2.3 to about 3.6 m. Grade of the riverside slope is from 1:1.8 to 1:2.7. Grade of the landside slope is from 1:1.8 to 1:2.35.

In case of the designed embankment the minimum parameters were adopted as follows: crest width of about 4.0 m (except for Podbipięty Street, where the width is greater and results from dimensions of the road course), grade of the riverside slope of 1:2.5 and of the landside slope of 1:2.0 (locally – within short sections – 1:1.5). The maximum height of the embankment shall rise to about 5.4 m for **Section 1** and to 4.6 m for **Section 2**.

The embankment performs its main function of a flood embankment within the entire section. The slopes and the embankment crest are covered with grass. Sectionally, there are some roads of various courses on the crest. The embankments are and will be regularly mown. The embankments crosses such technical infrastructure as roads, water supply system, sewerage, heating and gas networks, and power and teletechnical lines.

Currently, the width of the River Vistula embanked area and of the Dłubnia river embanked area are as follows:

- a. Between the Dąbie Barrage and the Wandy Bridge (from km 80+900 to 87+900) – from 311 m (at the Dąbie Barrage – transient section between the boulevard facilities and the embankments) to 511 m in the area of Białuchna estuary (about km 82+000). The embanked area's width in that section is about 420 m, on average.
- b. Between the Wandy Bridge and the Przewóz Barrage (from km 87+900 to km 92+000) – from 404 m to 500 m, 460 m on average. An exception is the area of the Przewóz Barrage, where the embankments also protected the Vistula's oxbow lake with the estuary of Drwina, where the embanked area's width reaches 1100 m.
- c. Between the Przewóz Barrage and the estuary of Suchy Jar (from km 92+000 to 96+500) – from 445 m to 482 m, 460 m on average.

- d. Section of the Dłubnia River estuary between the estuary to the River Vistula and Ptaszyckiego Street – from 161 m to 270 m.

Due to rising the crest of existing embankments and due to their extension toward the embanked area, it shall be narrowed, in reference to the maximum relocation of the crest towards the Vistula River – by 2 m, and embankments' bases are as follows:

- a. For Vistula embankments, section no. 1, up to 4 m,
- b. For Vistula embankments, section no. 2, up to 7 m,
- c. For Vistula embankments, section no. 3, up to 4 m,
- d. For the right embankment at Dłubnia, up to 6 m,
- e. For the left embankment at Dłubnia – 4 m.

At inclusion of the modernization scope for embankments in sections 1, 2, and 3, the minimum narrowing of the embanked area is as follows:

- a. Between the Dąbie Barrage and the Wandy Bridge (from km 80+900 to 87+900) – embanked area narrowed by 3 m, i.e. 0.7% of average width.
- b. Between the Wandy Bridge and the Przewóz Barrage (from km 87+900 to km 92+000) – embanked area narrowed by 6 m, i.e. 1.3% of average width.
- c. Between the Przewóz Barrage and the estuary of Suchy Jar (from km 92+000 to 96+500) – embanked area narrowed by 4.5 m, i.e. 1.0% of average width.
- d. Section of the Dłubnia River estuary between the estuary to the River Vistula and Ptaszyckiego Street – embanked area narrowed by 7 m, i.e. 4.3% of average width.

The impact of narrowing value for the embanked area on additional flood water damming has been estimated in conditions of gradually varied steady flow. At estimations for design water Q1%, which decided on the target height of embankments, the calculations – done with efficiency of 0.01 m – did not prove a necessity of additional height correction due to that reason. In case of the River Dłubnia in its estuary section a deciding factor is a flood on Vistula, backwater of which does not reach Ptaszyckiego Street at very low velocities of water flowing through the Dłubnia riverbed. Therefore, the width of embankments at the Dłubnia River and the volume of water flowing in it do not decide on the height of backwater embankments from the estuary to Vistula to Ptaszyckiego Street, despite the small spacing between them. To sum up, one shall state that potential additional damming associated with narrowing of the embanked area due to modernization works does not exceed 0.01 m, which is a negligible value for the adopted safety margin of 1.0 m above the elevation of design water.

For the purpose of redeveloping and extending the embankments it is mostly planned to apply the basic section – so-called type I. It is specified by extension of the embankment body on the embanked area's (river) side, reinforcement of the crest with gravel mix on geo-textile and voussoir, and service road at the buttress or at the landside embankment's foot (locally the road may move away from the embankment basis to e.g. bypass and protect objects of habitats located within the embankment route), hardened with sand ballast on geo-textile, breakstone and voussoir for the purpose of service vehicles' traffic.

Where it was not possible to develop the service road at the buttress or at the slope basis (e.g. due to the lack of space for the buttress or fenced premises directly neighboring the embankment, which collide with the route), so-called typical section was applied – type II, which – in comparison to type I – includes a service road on the embankment crest and it does not have a buttress.

Furthermore, in accordance with information provided in supplementation to the IDS, in locations where due to environmental and maintenance reasons or due to the lack of space it would not be possible to provide redevelopment according to type I and type II sections, type III was introduced, which comprises development of a membrane starting from the embankment crest, using the same technology as in case of the membrane applied in the subbase for type I and type II section.

Type of sections applied within analyzed sections of the redeveloped embankment are given in the table below.

<b>Section 1:</b>		
<i>Left embankment of Vistula from the Wandy Bridge to the estuary of Dłubnia</i>		
0+000	0+983	Type III – no rising of the embankment
0+983	1+142	Type II
<i>Left embankment of Vistula from the estuary of Dłubnia to the Przewóz Barrage</i>		
1+142	2+097	Type I
2+097	3+038	Type II
3+038	3+273	Type I
3+273	3+317	Type II
<i>Right embankment of Dłubnia from the estuary to the area of Ptaszyckiego Street</i>		
0+000	0+429	Type II
0+429	0+439	Existing road embankment at Podbipięty Street
0+439	<b>1+830</b>	Type II
<i>Left embankment of Dłubnia from the estuary to the area of Bardosa Street</i>		
0+000	0+363	Type I
0+363	0+394	Existing road embankment at Podbipięty Street
0+394	0+835	Type II
0+835	1+136	Type II
<b>Section 2:</b>		
0+000	0+308	Type II
0+308	1+274	Type I
1+274	1+482	Type II
1+482	1+611	Type I
1+611	1+746	Type II
1+746	1+941	Type I
1+941	2+143	Type II
2+143	2+740	Type I
2+740	2+875	Type II

In a reach from 1+700 to 1+830 (working chainage km, registered end of embankments) the works shall practically include development of crest reinforcement only, according to section type II, without developing a visible rising of the embankments (sufficient land elevation), within a registered route of the embankments (the embankment is present in a registry kept by MZMiUW – the Investor). An exception for that section is a break provided to bypass a sewerage chamber at chainage from km 1+778 to 1+802, developed in a form of descend roads from the crest.

In a reach from km 0+000 to km 0+983 it is not planned to raise the existing embankments. That section is included in the investment implementation scope and impact range, due to possible occurrence of necessary sealing for the embankment and / or the subbase. Currently, it is planned to develop a membrane in that section – driven from the crest into the subbase onto a depth of 6 m.

The rising designed for any of the sections does not run beyond the existing embankment. The rising reaches the embanked area mainly. It is most often caused by neighboring development or facilities

on the landside (area beyond the embankment). The correction of the embankment section is visible along the stand of hermit beetle and results from the necessary maintenance of that valuable environmental habitat. The table given below provides location of the correction for the embankment course.

Location	Description
Section 1. Left backwater embankment of Dłubnia, km 0+190 to 0+000 River Vistula embankment 1+142 to 1+180	Relocation of the designed axis towards the area beyond the embankment by about 2.5-3 m, resulting from the necessary protection of a valuable environmental stand – lane of willows inhabited by hermit beetle

Within the framework of the planned investment a membrane was designed for the following sections:

- **Section 1 left embankment of the River Vistula from km 0+008 to km 0+993**, with a membrane developed from the crest towards the subbase to a depth of 6 m. Embankment body sealed using the same technology as in case of the subbase.
- **Section 1 left embankment of the River Vistula from km 0+993 to km 1+142**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section no. 1 right embankment of the River Dłubnia from km 0+000 to km 1+180** (with a break at chainage km 0+420-0+457 after crossing Podbipięty Street), with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section no. 1 left embankment of the River Dłubnia from km 0+845 to km 1+136**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 3 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section no. 1 left embankment of the River Dłubnia from km 0+190 to km 0+835** (with a break at chainage km 0+359-0+397 after crossing Podbipięty Street), with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 1 left embankment of the River Dłubnia from km 0+000 to km 0+190**, with a membrane developed from the crest towards the subbase to a depth of 6 m. Embankment body sealed using the same technology as in case of the subbase.
- **Section 1 left embankment of the River Vistula from km 1+142 to km 1+200**, with a membrane developed from the crest towards the subbase to a depth of 6 m. Embankment body sealed using the same technology as in case of the subbase.
- **Section 1 left embankment of the River Vistula from km 1+200 to km 2+097**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 1 left embankment of the River Vistula from km 3+000 to km 3+315**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 2 left embankment of the River Vistula from km 0+080 to km 2+870** (with a break at chainage km 1+050-1+067 for the discharge from an embankment culvert at the MPWiK's pumping station), with a membrane developed at the riverside basis of the embankment towards



*the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.*

Depth of the membrane results from the specific geological structure of the river subbases in Carpathian dales, which has been proved with geological surveys.

Within the framework of the investment it is planned to redevelop, construct, remove embankment crossings and descend roads, and embankment culverts (locks). The planned new descend roads most often join the embankment crest with a shelf on the embankment or they remain a bypass of objects in the embankment course (e.g. existing sewerage chambers) or a link with bicycle path.

*Reinforced-concrete openwork road slabs were applied for embankment crossings and descend roads, and in case of asphalt roads administered by ZIKiT in Cracow – asphalt concrete. Their application is necessary to protect the embankment crest against excessive passing over. The application of openwork slabs shall allow for simultaneous maintenance of the surface as partially permeable. Descend roads from the crest to a service shelf have a course made of voussoir. In order to limit the area acquired by embankments of embankment crossings and descend roads – as those often are arable fields – the grade of slopes beyond the embankment was increased to 1:1.5 and within the embanked area to 1:2.*

The table given below presents location of the existing and of new descend roads and crossings.

No.	Embankment section	Embankment km	Existing/new descend road	Remarks
1	Vistula section 1	0+983	Existing, extended	Descend from the crest to the road
2	Vistula section 1	0+992	Existing, extended	Descend from the crest to a private plot
3	Vistula section 1	1+080	Existing, extended	Embankment crossing
4	Dłubnia right embankment	0+374	Existing, extended	Embankment crossing
5	Dłubnia right embankment	0+421	Existing, extended	Descend from the crest to the road
6	Dłubnia right embankment	0+428	Existing, extended	Descend from the crest to the road
7	Dłubnia right embankment	0+439	Existing, extended	Descend from the crest to the road
8	Dłubnia right embankment	0+487	Existing, extended	Embankment crossing
9	Dłubnia right embankment	0+697	new	Descend from the crest to the sewerage chamber
10	Dłubnia right embankment	1+045	Existing, extended	Embankment crossing
11	Dłubnia right embankment	1+188	Existing, extended	Descend from the crest to the road
12	Dłubnia right embankment	1+441	Existing, extended	Descend from the crest to a private plot
13	Dłubnia right embankment	1+712	Existing, extended	Descend from the crest to a private

				<i>plot</i>
14	<i>Dłubnia right embankment</i>	<i>1+772 to 1+806</i>	<i>new</i>	<i>Descend from the crest – bypass of the sewerage chamber</i>
15	<i>Dłubnia right embankment</i>	<i>1+829</i>	<i>new</i>	<i>Descend from the crest to a bicycle path</i>
16	<i>Dłubnia left embankment</i>	<i>0+951</i>	<i>Existing, extended</i>	<i>Embankment crossing</i>
17	<i>Dłubnia left embankment</i>	<i>0+823</i>	<i>Existing, extended</i>	<i>Embankment crossing</i>
18	<i>Dłubnia left embankment</i>	<i>0+470</i>	<i>Existing, extended</i>	<i>Embankment crossing</i>
19	<i>Dłubnia left embankment</i>	<i>0+369</i>	<i>Existing, extended</i>	<i>Descend from the embankment shelf to the road</i>
20	<i>Dłubnia left embankment</i>	<i>0+357</i>	<i>Existing, extended</i>	<i>Embankment crossing</i>
21	<i>Vistula section 1</i>	<i>1+346</i>	<i>Existing, extended</i>	<i>Descend from the embankment shelf to the State Treasury's plot</i>
22	<i>Vistula section 1</i>	<i>1+433</i>	<i>Existing, extended</i>	<i>Embankment crossing</i>
23	<i>Vistula section 1</i>	<i>2+086</i>	<i>Existing, extended</i>	<i>Descend from the crest to the State Treasury's plot</i>
24	<i>Vistula section 1</i>	<i>2+097</i>	<i>Existing, extended</i>	<i>Descend from the crest to the State Treasury's plot</i>
25	<i>Vistula section 1</i>	<i>2+153</i>	<i>Existing, extended</i>	<i>Descend from the crest to the State Treasury's plot</i>
26	<i>Vistula section 1</i>	<i>2+403</i>	<i>Existing, extended</i>	<i>Embankment crossing</i>
27	<i>Vistula section 1</i>	<i>2+975</i>	<i>Existing, removed</i>	<i>Removal of the crossing</i>
28	<i>Vistula section 1</i>	<i>3+028</i>	<i>Existing, extended</i>	<i>Embankment crossing</i>
29	<i>Vistula section 1</i>	<i>3+139</i>	<i>Existing, extended</i>	<i>Embankment crossing</i>
30	<i>Vistula section 1</i>	<i>3+204</i>	<i>Existing, extended</i>	<i>Descend to the State Treasury's plot</i>
31	<i>Vistula section 1</i>	<i>3+314</i>	<i>Existing, extended</i>	<i>Descend to the plot of the Municipality of Cracow</i>
32	<i>Vistula section 2</i>	<i>0+259</i>	<i>Existing, extended</i>	<i>Embankment crossing</i>

33	Vistula section 2	0+308	Existing, extended	Descend from the embankment shelf to the road
34	Vistula section 2	0+433	Existing, extended	Descend from the shelf to a public plot
35	Vistula section 2	0+511	New	Descend from the embankment shelf to a public plot
36	Vistula section 2	0+551	Existing, extended	Embankment crossing
37	Vistula section 2	1+030	Existing, extended	Embankment crossing
38	Vistula section 2	1+211	Existing, extended	Embankment crossing
39	Vistula section 2	1+327	Existing, extended	Descend from the crest to a private plot
40	Vistula section 2	1+327	New	Descend from the crest to the embankment shelf
41	Vistula section 2	1+429	Existing, extended	Embankment crossing
42	Vistula section 2	1+429	New	Descend from the crest to the embankment shelf
43	Vistula section 2	1+655	New	Descend from the crest to the embankment shelf
44	Vistula section 2	1+655	Existing, extended	Embankment crossing
45	Vistula section 2	1+684	Existing, extended	Embankment crossing
46	Vistula section 2	1+702	New	Descend from the crest to the embankment shelf
47	Vistula section 2	1+979	Existing, extended	Embankment crossing
48	Vistula section 2	1+979	New	Descend from the crest to the embankment shelf
49	Vistula section 2	2+040	New	Descend from the crest to the road
50	Vistula section 2	2+094	Existing, extended	Embankment crossing

51	Vistula section 2	2+099	New	Descend from the crest to the embankment shelf
52	Vistula section 2	2+780	New	Descend from the crest to the embankment shelf
53	Vistula section 2	2+784	Existing, extended	Embankment crossing

Tabulated summary of culverts (embankment locks) planned for redevelopment.

Culvert no.	Embankment km	River km	Diameter [cm]	Remarks	A [ha]	Q1% [m³/s]	Designed diameter [cm]	Remarks
<b>Section 1</b>								
P.1.1	0+875	88+784	Ø115	Object underneath Longinusa Podbipięty Street. Reinforced-concrete, not to be redeveloped.	137	0.980	-	No changes to the culvert
<b>Diubnia embankments</b>								
P.1.5	0+842	1+188	Ø60	Left embankment. Outlet from the pumping station, reinforced-concrete.	0.16	0.045	Ø60	Extension of the culvert.
<b>Section 2</b>								
P.2.1	1+059	94+524	2 x (230x205)	Reinforced-concrete object, outlet from the pumping station.	205	1.92	-	Redevelopment and extension of the abutment
P.2.3	2+813	96+481	80x120 bell-shaped	Reinforced-concrete object.	183	1.76	Ø100	Extension of the culvert.

It is also planned to demolish a closed culvert at chainage km 1+073 of the embankment in section 2 (chainage km 94+538 of the Vistula River).

As a result of increasing the embankment section it shall be necessary to locally redevelop or protect such infrastructure as: power and IT lines, and gas, water-supply, sewerage and heating networks.

A tabulated summary on information concerning collisions between technical infrastructure with the planned investment, which not necessarily requires redevelopment, was given below.

No.	Embankment section	Embankment km	Description
1	Vistula section 1	0+016	Overhead IT line
2	Vistula section 1	0+089	Ground power cable network
3	Vistula section 1	0+111	Ground power cable network
4	Vistula section 1	0+808	Ground power cable network
5	Vistula section 1	0+809	Ground power cable network
6	Vistula section 1	0+910	Overhead IT line
7	Vistula section 1	0+973	Overhead IT line

8	Vistula section 1	1+001	Overhead IT line
9	Vistula section 1	1+105	Overhead power line
10	Dłubnia right	0+421	Overhead IT line
11	Dłubnia right	0+427	Ground power cable network
12	Dłubnia right	0+709	Sewerage network 2xk1800
13	Dłubnia right	0+844	Gas network g150 L/P
14	Dłubnia right	0+905	Overhead power line
15	Dłubnia right	1+068	Overhead power line
16	Dłubnia right	1+201	Gas network g250 H/P
17	Dłubnia right	1+218	Gas network g100 L/P
18	Dłubnia right	1+255 – 1+678	Gas network g300 M/P
19	Dłubnia right	1+429	Overhead power line
20	Dłubnia right	1+441 – 1+828	Gas network g200 PS/C
21	Dłubnia right	1+617	Sewerage network k550
22	Dłubnia right	1+646	Ground power cable network
23	Dłubnia right	1+678	Gas network g300 M/P
24	Dłubnia right	1+784	Sewerage network k1000
25	Dłubnia right	1+789	Sewerage network k1950/1200
26	Dłubnia right	1+825	Water-supply system w400
27	Dłubnia right	1+827	Sewerage network k300
28	Dłubnia right	1+828	Overhead power line
29	Dłubnia left	0+305	Water-supply pipe w230, w160
30	Dłubnia left	0+353	Overhead IT line
31	Dłubnia left	0+000 – 0+353	Ground IT line
32	Dłubnia left	0+368	Ground power cable network
33	Dłubnia left	0+635	Sewerage network 2xk1200, 2xk500
34	Dłubnia left	0+638	Gas pipe g150 L/P
35	Dłubnia left	0+672	Gas pipe g500 H/P
36	Dłubnia left	0+681	Gas pipe g250 H/P
37	Dłubnia left	0+720	Gas pipe L/P
38	Dłubnia left	0+927	Overhead power line
39	Dłubnia left	0+845	Overhead power line
40	Vistula section 1	1+142 – 1+560	Ground IT network
41	Vistula section 1	1+256	Gas pipe g300 H/P
42	Vistula section 1	1+304	Gas pipe g300 H/P
43	Vistula section 1	1+351	Gas pipe g500 H/P
44	Vistula section 1	1+407	Gas pipe g500 H/P
45	Vistula section 1	1+505	Water-supply system
46	Vistula section 1	1+605	Overhead power line
47	Vistula section 2	0+063	Sewerage k300
48	Vistula section 2	1+541	Overhead power line
49	Vistula section 2	1+726	Overhead power line

*The planned area determined in the application is about 79.8 ha – section 1, and about 33.7 ha – section 2. The area of properties or their parts, which remain a part of the investment, necessary for its implementation – becoming properties of the State Treasury or a unit of local self-government – is about 12 ha – section 1, and about 9 ha – section 2.*

*Within the framework of the investment it is also necessary to restore the existing condition of a discharge ditch from the embankment lock no. P.2.3 at chainage km 2+813. As the existing ditch*

*discharging water through the embanked area was – due to accumulation of sediments brought by flood water in the embanked area – significantly silted and it does not allow for the proper discharge of rainfall from the embankment lock at chainage km 2+813; the lack of discharge hampers closing of the return valve of the embankment lock and forms a risk of flooding for the area beyond the embankment at the event of flood. The works shall include restoring the original cross-section of the ditch through the removal of soil deposits, rotten plants, and other pollutions. It is not planned to modify the depth or to extend the cross-section of the ditch.*

The basic scope of works contains the works associated with redevelopment and extension of the embankments. Those shall mainly be the earthworks including e.g.:

- Removal of top top-soil layer from the slopes and from the embankment crest, and from the land strip adjacent to the embankment in order to prepare the site for extension (development of embankment);
- Profiling of uncovered slopes for the earth-fill embankment (so-called stair-shaping) and ploughing of the strip of land for the purpose of extension;
- Development of a membrane in the subbase;
- Development of an earth-fill embankment – extension;
- Placement of bentomat;
- Completion of the embankment – extension;
- Placement of a transition layer made of mineral soil;
- Placement of a top-soil layer with sowing using mix of grass.

Works associated with redevelopment of embankment locks – which shall be extended (what is related to the development of new reinforced-concrete abutments and to the redevelopment of descend roads, crossings through the embankment in the course of service roads, field roads or private roads, as well as asphalt public roads) – shall be directly associated with those works.

The basic membrane shall be developed using a bucket-ladder excavator under cover of a thixotropic suspension. Locally, the membranes shall be developed using different excavators, drills for deep soil mixing with injection of cement leaven, or they shall be driven using a pile-driver (vibro-hammer).

The investment shall be implemented with the application of general engineering technologies basing upon earthworks, concrete works, reinforced-concrete works, piling works, and installation works mainly. During the works one shall apply such machines as excavators, loaders, trucks, cranes, rollers, concrete mixers, concrete pumps, vibrators and compactors.

Implementation of the investment shall not affect landscape values adversely, as the course would not change and new elements would not be introduced to the landscape.

### **3. Item 1c “Type and character of the investment including the following”**

*c) “Biological diversity, use of natural resources, including soil, water and earth surface.”*

**gains the following new meaning:**

It was originally planned to take the soil for construction of the embankments from deposits present in the following locations:

- a) *Deposit no. 1 – chainage of the Vistula River about km 82+500, right bank, embanked area – area of 3.94 ha;*
- b) *Deposit no. 2 – chainage of the Vistula River about km 89+500, left bank, embanked area – area of 5.59 ha;*
- c) *Deposit no. 3 – chainage of the Vistula River about km 86+000, right bank, embanked area – area of 2.53 ha;*

- d) *Deposit no. 4 – chainage of the Vistula River about km 88+900, left bank, embanked area – area of 2.01 ha;*
- e) *Deposit no. 5 – chainage of the Vistula River about km 91+200 right bank, embanked area – area of 1.24 ha;*
- f) *Deposit no. 6 – chainage of the Vistula River about km 93+700, left bank, embanked area – area of 1.18 ha;*
- g) *Deposit no. 7 – chainage of the Vistula River about km 85+500, right bank, embanked area – area of 1.68 ha;*
- h) *Deposit Brzegi, area of 3.09 ha – purchase of materials from KZEK Kraków.*

However, after performing geological tests of deposits' utility for the intake of soil and after establishments made with land owners, the following deposits were left only:

- a) *Deposit no. 1 – chainage of the Vistula River about km 82+500, right bank, embanked area. Due to the significant amount of waste materials deposited in the past that deposit may be used in a small part only for the intake of non-cohesive soil above the table of ground water.*
- b) *Deposit no. 4 – chainage of the Vistula River about km 88+900, left bank, embanked area. The deposit is made of up to 3.0 m deep layer of cohesive soil (loam and loamy sand) placed on non-cohesive soil (medium sand, dusty sand). The level of ground water is about 3.3 m below the ground level. The expected use of up to 3.0 m deep below the level of ground.*
- c) *Deposit no. 6 – chainage of the Vistula River about km 93+700, left bank, embanked area. The deposit is made of up to 1.6 m deep layer of cohesive soil (sandy dust) placed on non-cohesive soil (fine sand). The level of ground water is about 5.7 m below the ground level. The expected use of up to 3.0 m, including cohesive soil and non-cohesive soil.*
- d) *Deposit – Brzegi. The area of aggregate extraction by the Krakowskie Zakłady Eksploatacji Kruszyw [Aggregate Extraction Plant of Cracow - KZEK]. In case of layers located at surface layers soil placed in that deposit is waste (KZEK extracts non-cohesive soil and sorts it) for the extraction plant, but it would be a valuable material for the construction of a static body of the embankments. That soil shall be bought from KZEK and delivered to the embedding location. Due to the need for soil in the amount of about 300 K m<sup>3</sup>, the most of materials to be embedded shall be taken from the deposit in Brzegi.*

Sites indicated for the intake of soil from deposits are located within land where plant production is not done, and location of the pits shall not effect in a risk of damaging the flood embankments during the accommodation of flood waves. The adopted extraction levels above the table of ground water – depending on the water level in Vistula dammed at the Przewóz Barrage – allow for the intake of soil in condition allowing for embedding into the embankment body without drying. Simultaneously the scope of extraction would not result in the occurrence of water pits after rainfall or flood, because the pit bottom would be left at the level of highly permeable ground, above the table of ground water. Some kind of inconsistency during floods is the occurrence of water table in the pit with elevation compliant with the water level in the Vistula River (not related to the Brzegi deposit). To sum up, leaving of the pits would not affect the ground water levels and the water environment as the adopted extraction level would not allow for the occurrence of any water environment. In accordance with the extraction project for deposits no. 1, 4, and 6, the contractor shall be obliged to shape the slopes at edges of pits, with grade of 1:2.5, including top-soiling and sowing, after completion of the works.

The materials purchase from the Brzegi deposit are natural soil, without pollution, and they shall be embedded above the ground water level; thus, no impact on the water environment and on the water-ground environment is expected in that case.

Furthermore, it is expected to use the following on the investment implementation stage:

- Water: volume of about 1.2 m<sup>3</sup>/day on average, up to about 3.6 m<sup>3</sup>/day at the peak of the works;
- Power: depending on the quantity and quality of the equipment used for the work, e.g. concrete mixer. Estimated demand for power on the construction site is about 25 kW.

**4. Item 2e. “Location of the investment, including possible hazard to the environment, and especially at the existing and planned land use, self-purification possibilities for the environment and renewal of natural resources, environmental and landscape values and local conditions under spatial management plans.”**

*e) “Areas requiring special protection due to the presence of plant, animal, and fungi species or their habitats or natural habitats under protection, including Natura 2000 sites and other forms of environmental protection.”*

**gains the following new meaning:**

*Implementation and operations of the planned investment shall not adversely affect legally protected areas established based upon the Act of 16 April 2004 on the conservation of nature. The analyzed investment is located beyond the boundaries of European Ecological Network Natura 2000. The closest site – Łąki Nowohuckie PLH120069 – is located in a distance of about 1.1 km north from the closest boundary of the investment site. The area is placed within the Vistula valley (in the former flood terrace). On the south it borders the Vistula’s oxbow lake, on the north – the center of Nowa Huta, precinct of Cracow. Łąki Nowohuckie is the last well-kept part of meadows at Vistula in Nowa Huta. One can find over 10 diversified plant groups within a small area. The main objective of protection within the aforementioned area is the protection of meadow habitats (moor-grass meadows and oat-grass meadows) as habitats of butterflies remaining the main subject of protection. There is no adverse impact of the investment on subject of Natura 2000 site protection.*

*The biggest impact of the investment on the environment shall be seen on implementation stage. Due to the works and machines applied the following emission shall occur: gas and dust to the air, noise, waste; those shall however be short-term and reversible nuisances. Acoustic nuisance associated with the development time shall end at the completion of works.*

*The planned earthworks in the area of valuable habitats present on parts of riparian patches in the area of Cracow (codes 91E0 and 91F0) shall be maximally limited. Materials shall be delivered to the construction site using public roads, and temporary roads shall be developed beyond the aforementioned areas of valuable habitats.*

*The analysis done for the environmental inventory completed for the task proves that at the bank of Vistula and within the embanked area, on site grown with trees and shrubs, presence of beavers was noted. The biggest number of fresh traces was noted in **section no. 1**, from the Wandy Bridge to the Przewóz Barrage. In **section 2** the Vistula riverbed is deep, with steep and sliding banks, and agricultural land and wasteland dominate within the embanked area. In that section there are no spots inhabited by beavers. The designed land acquisition boundaries for the planned construction works runs in a distance of max. 5 m from the embankment foot. As a consequence, it shall be necessary to obtain a decision of the Regional Director for Environmental protection in Cracow allowing for deviation in case of protected animal species. During the construction works an adverse*



impact – i.e. scaring and disturbance of beavers – shall be exerted in case of specimens inhabiting spots grown with trees and shrubs in vicinity of the embankments and within the embanked area. After completion of the works the adverse impact shall stop.

Based upon the site tests species of plants to be strictly or partially protected were not identified within the discussed section of Vistula embankments. A habitat of hermit beetle occurs on willows growing along the basis of the left Dłubnia embankment at chainage from km 0+000 to 0+185. As a consequence, the axis of designed extension and the temporary road – to be used as a service road during the construction phase – were moved away, so the scope of works and deliveries were done beyond the roots; and during the works in that section of embankment they would be protected with a temporary barrier on the temporary road's side and the trunks would be wrapped with protective mat. They shall also not be covered. The embankment foot shall be left in the present place.

Necessary logging of trees and shrubs is planned under the investment. The logging shall be limited only to trees and shrubs growing just at the spot of redevelopment and extension, and trees growing in the direct vicinity of the works shall be protected against damaging.

In order to minimize nuisance associated with implementation of the subject task, the Investor obliged itself to apply the following solutions protecting the environment:

- Any work during implementation of the investment shall be performed under constant supervision of environmental team,
- It is forbidden to undertake any actions to dry the Vistula's oxbow lake in vicinity of Brzegi, what may adversely affect diverse humidity and humid habitats formed in that area,
- Works shall not be done where valuable environmental habitats occur – riparian forests (91E0, 91F0). Those patches are usually located in a distance from flood embankments, but one shall take care in planning the works, to avoid damaging, e.g. during deliveries of construction material to the construction site. It is forbidden to set the technological roads out through or in a direct vicinity of that habitat. In case of a small distance any work associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment.
- In case of a habitat with oak-elm-ash riparian forest (91F0) at chainage km 0+250 to 0+350 of the Vistula embankment in section 2, the riparian forest grows on both sides of the embankment. In that case any works associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment. One is not allowed to set the technological roads out or located temporary backyard facilities within that habitat. Any work shall be done with high care to avoid damaging of the surrounding riparian tree-stand.
- It is forbidden to perform works, take materials, as well as set the technological roads out in the area of habitat of hay meadows (6510). Any works associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment.
- As a result of identifying a stand of very valuable species of hermit beetle, which is located in old, rotting willows growing at the embankment on the embanked area's side, the works at redevelopment of the embankments in that section were designed to avoid threatening to the existing stand. Relocation of the embankment shall assure the protection of the trees as well as their root system. A technological road shall be placed on the opposite side, i.e. in the area beyond the embankment. Prior to the commencement of works it was expected to protect the trees additionally against damaging and covering using protection made of straw mats and wooden fences. All of the protection works shall be supervised by an environmentalist,
- Any work shall be done to avoid drying of water pits, Vistula oxbow lakes,

- Any locations of back-up facilities shall be placed beyond the area of valuable environmental habitats, and also beyond areas of medium and high ornithological value, and beyond habitats of amphibians and beavers,
- The Contractor for the investment is obliged to inspect vehicles and construction machines in terms of technical efficiency. In case of machine failure any leakage of operating fluid and fuel shall be neutralized with relevant amount of absorbent stored at every back-up facility.
- Tree trunks located within the work site or in its direct vicinity under risk of mechanical damaging shall be protected against damaging at height not smaller than 1.5 m from the ground level, and materials shall not be stored and new delivery routes shall not be set out in a distance of 1 m from trunks of trees and shrubs,
- The area of back-up facilities, where machines and trucks would operate, shall be protected. Parts of back-up facilities, tightly insulated from the ground, shall be designated for servicing and fueling of the machines.
- Waste produced during implementation of the investment shall be segregated and selectively stored in containers or in separated sites adapted to that purpose, in conditions preventing dusting and blowing light fractions away, and preventing adverse impact on the environment; they should be consecutively taken over by units certified for their further treatment,
- Logging shall be done only beyond the hatching period for birds, i.e. from the beginning of October to the end of February. In case it would be necessary to perform an additional logging within the hatching period, the works may be done only under supervision of an ornithologist.
- Any work performed in vicinity of hatching habitats of amphibians – identified on an ongoing basis by the environmental supervisor – may be performed only at application of herpetological fencing protecting the construction site against migration of amphibians. In case of identifying specimens of amphibians, they will be caught on an ongoing basis and relocated to substitute habitats existing in a safe distance. A list of those habitats shall be developed for an application on the issuance of derogation for measures forbidden in reference to protected species.

Prior to the commencement of spring migration of amphibians the construction site in the area of culverts, ditches and water-courses shall be surrounded with a temporary herpetological fencing. During the migration the amphibians gathering at the fencing shall be caught and relocated to a relevant habitat, i.e. in spring from the embanked area to a flowage in the area beyond the embankment, and in autumn – the other way round. After completion of the works the temporary fencing shall be removed.

In case of the works in occurrence locations from March to October, adult specimens of amphibians, their eggs (spawn) and larvae (tadpoles) shall be caught and relocated based upon a decision of the RDOŚ in Cracow on the deviation from bans related to the protected species of amphibians. Potential covering of habitats shall be done in autumn and in winter (November – February).

Considering the: character, location of the investment and planned mitigation measures, it was identified that its implementation shall not significantly and adversely affect the protected items of the closest Natura 2000 site Łąki Nowohuckie PLH120069 and the cohesion of the European Ecological Network Natura 2000.

**5. Item 2 K. *“Location of the investment, including possible hazard to the environment, and especially at the existing and planned land use, self-purification possibilities for the environment***

***and renewal of natural resources, environmental and landscape values and local conditions under spatial management plans”***

f) *“Water and environmental objectives referring to it.”*

**gains the following new meaning:**

The planned modernization of embankments: section 1 – Left embankment of the Vistula River from km 87+900 to km 91+540 (Wandy Bridge – Klasztorna Street at the Przewóz Barrage), and section 2 – Left embankment of the Vistula River from km 91+990 to km 96+680 (Przewóz Barrage to Suchy Jar Stream); is located at two bodies of surface water BSW *Wisła od Skawinki do Podłężanki* (having the European code PLRW2000192137759) and BSW *Dłubnia od Minóžki (bez Minóžki) do ujścia*, (having the European code PLRW2000921376), where partially the modernized backwater embankments of the River Dłubnia are located.

In accordance with the Water Management Plan for the Vistula River Basin, adopted with a regulation of the Council of Ministers of 18 October 2016 on the Water Management Plan for the Vistula River Basin (OJ of 2016, item 1911), both of the BSW were classified as highly transformed body of water with bad water status. The environmental objective for highly modified and artificial water bodies is protection of those waters and enhancement of their ecological potential and chemical status in order to achieve the good ecological potential and good chemical status.

In case of BSW *Dłubnia od Minóžki (bez Minóžki) do ujścia* a moderate ecological potential decided about bad water status, and the determining factors were phytobenthos and ichthyofauna. The environmental objective for that BSW is the good ecological potential and good chemical status; however, achievement of the aforementioned objective was assumed as under risk, thus time derogation 4(4)-1 was implemented and the deadline for achievement of the environmental objective was rescheduled to 2021. Implementation of derogation was justified by the lack of technical possibilities for removal of reasons for the bad status. Pressure, which may be a reason for exceedance of quality rates, was not identified in catchment of BSW *Dłubnia od Minóžki (bez Minóžki) do ujścia*. It is necessary to recognize the reasons in details in order to properly plan the recovery measures. Identification of the reasons for not achieving the good status shall be secured by implementation of measures on the national level: development of a state database on hydro-morphological changes, performance of deep pressure analysis in terms of hydro-morphological changes, development of good practices for hydraulic works and maintenance works, including establishment of implementation rules and development of a state renaturalization programme for ground water. The proposed modernization of flood embankments shall not deteriorate hydromorphological elements, thus it shall not contribute to not achieving the environmental objectives.

In case of BSW *Wisła od Skawinki do Podłężanki*, bad ecological potential decided on the bad water status. The environmental objective for that water body is the good chemical status, good ecological potential of water, migration possibilities for water organisms in a reach of significant water-course, i.e. *Wisła od Podłężanki do Skawinki*. Update of the Water Management Plan for the Vistula River Basin stated that there is a risk of not achieving the established environmental objectives, thus derogation 4(5)-1 and 4(5)-2 was implemented. Implementation of derogation was justified with a lack of technical possibilities and disproportionate costs. Impact of human pressure on the status of BSW and on the absence of technical possibilities to limit that impact on the water generates necessary establishment of less rigorous objectives in case of coefficients specifying the salinity. Simultaneously, the time necessary for implementation of the measure comprising establishment of a boundary value for the good status/potential – for parameters, for which the environmental

objective was decreased – results in necessary rescheduling of achieving the environmental objectives by the BSW until 2021. The present business activity is strictly associated with the occurrence of natural resources and with the industrial character of the river basin.

The planned investment shall not deteriorate biological elements and supporting physical and chemical elements and hydromorphological elements, and it shall not affect the chemical status of water adversely on the use stage. The use of flood embankments does not cause emission of pollutions, which may affect physical and chemical elements of water or their chemical status. In case of normal flow in Vistula the existing embankments are neutral for the water and soil environment. Water discharges from the river basin naturally or is pumped out to the embanked area and flows down to Vistula (or to Dłubnia), and modernization of the embankments would not change that, as it results from few tens of years of embankments' presence. Previous discharge conditions would be kept in case of the river basin, and due to repairs, redevelopment and maintenance work done they would even be improved. Development of a water-tight membrane in the embankment body would result in its smaller saturation with rainfall water and with flood water. It would however not result in the total reduction of the inflow of rainfall water, and it would not affect capillary suction, thus plants growing on embankment slopes and on the crest would be kept, as in case of previously developed embankments (in sections developed earlier). A serious threat of deterioration of physical-chemical or hydromorphological elements of the Vistula River or the Dłubnia River would also not occur during implementation of the assignment. During the performance it is not expected to close the embankment locks completely for the water flow, and therefore there will be no long time damming of water within the area beyond the embankment. New outlets developed, new return valves assembled, and enhance capacity of discharge ditches shall reduce a failure risk and shall improve the discharge. Therefore those shall be positive measures.

*In accordance with a division of bodies of ground water given in the Water Management Plan for the Vistula River Basin, the investment site is mostly located within the body of ground water BGW no. 148 (European code: PLGW2000148), and in the south-eastern area – within BGW no. 131 (European code: PLGW2000131). In case of BGW no. 148 and BGW no. 131, the quantitative status and the chemical status was determined as good and it is not under risk of not achieving the environmental objective. The environmental objective for the bodies of ground water is preventing or limiting implementation of pollution, preventing the deterioration and improvement of their status, protecting and undertaking recovery measures, as well as assuring the balance between the discharge and feeding for that water in order to achieve its good status.*

Impact of the investment shall mainly be seen during the implementation, during the: intake of materials for construction purposes from deposits located within the embanked area – short-time silting up of ground water at uncovering spot. Construction excavations shall be dug above the level of ground water (which is usually located on a depth of about 4-5 m, locally shallower – about 2-3 m b.g.l.), and it is not necessary to decrease the water-table for ground water.

Rising of the embankments shall not affect the ground water. However, the designed anti-filtration membrane shall remain a suspended membrane, i.e. it shall not reach non-permeable soil and it shall not affect the ground water. Non-permeable soil is present on a depth of about 12 m b.g.l., whereas the designed membrane shall reach maximally up to about 6 m b.g.l. The calculations prove that in regular flow conditions in the river the membrane shall affect the ground water table by about 5-10 cm, what – in comparison to seasonal ground water level fluctuations of 1-2 m – remains an omittable value. A distinct impact of the membrane on the level of ground water shall be seen during

floods only – the membrane shall reduce velocity of ground water filtration towards the area beyond the embankment; thus it would reduce a risk of hydraulic puncturing and of flooding of the area beyond the embankment. In case of embankment redevelopment the designed “suspended” anti-filtration membrane shall not adversely affect the ground water, and its impact during floods shall be positive. Such materials applied for the membrane development as cement, bentonite and steel shall be certified materials, not having adverse impact on the ground water.

The designed investment shall not affect the quantity and the quality of water, it shall not change resources of surface water and of ground water. It is not associated with conditions justifying derogation. Therefore, there is no impact on the achievement of environmental objectives for the aforementioned BSW and BGW.

III. The requested modification of the environmental decision comprises additional plots due to the necessary restoration of the existing condition in case of the discharge ditch from the embankment culvert no. P.2.3 at chainage km 2+813.

IV. The remaining contents of the decision on environmental conditions, as issued by the Regional Director for Environmental protection, dated 07/27/2017, ref. no.: OO.4233.4.3016.BM, **remain unchanged.**

V. Based upon the Investor Proxy’s decision filed in writing on 01/03/2019, ref. no.: PK/OI/15008/12/2019, **I make the modified decision immediately enforceable.**

### **Justification**

The State Water Holding Polish Waters Regional Water Management Authority in Cracow, 22. Marszałka J. Piłsudskiego Street, 31-109 Cracow, represented by Mr. Radosław Radoń – Manager of the Odra-Vistula Flood Management Project Implementation Office at the Regional Water management Authority in Cracow, applied on 05/07/2018 (reception date: 05/10/2018), ref. no.: KR.JRP.981.8.11.2018 to the local authorities for modification of the decision on environmental conditions, as issued by the Regional Director for Environmental Protection on 01/27/2017, ref. no.: OO.4233.4.2016.BM, for the investment titled: **“Completion of the rehabilitation of the flood embankments of the Vistula River in Kraków: Section 1- the left embankment of the Vistula from the Wanda bridge to the Przewóz barrage, together with the backwater embankments of the Dłubnia River; Section 2 - the left embankment of the Vistula from the Przewóz barrage to Suchy Jar”**, due to necessary extension of implementation boundaries and of the investment impact range, as results from provision of details and from establishments made on design solutions for the subject investment, for which the decision of the Regional Director for Environmental Protection in Cracow dated 01/27/2017, ref. no.: OO.4233.4.2016.BM, was issued.

In the course of proceedings the application was supplemented with formal parts with notes: dated 06/06/2018 (reception date: 06/07/2018), ref. no.: KR.JRP.081.8.11.2018; dated 06/27/2018 (reception date: 06/27/2018), ref. no.: KR.JRP.081.8.11.2018; dated 07/05/2018 (reception date: 07/06/2018), ref. no.: KR.JRP.081.8.11.2018; and dated 07/13/2018 (reception date: 07/16/2018), ref. no.: HTK/AD/1500/1310/18; and supplemented with substantial parts with notes: dated 09/17/2018 (reception date: 09/17/2018), ref. no.: HTK/AD/15008/1627/18; dated 11/09/2018 (reception date: 11/09/2018), ref. no.: HTK/AD/15008/1932/18; and dated 12/07/2018 (reception

date: 12/20/2018), ref. no.: HTK/AD/15008/2067/18; updated with clarifications submitted by e-mail on 12/20/2018 (those clarifications have been directly submitted by the Proxy to the Ministry of Navigation and Maritime Affairs).

On 06/27/2018 the Investor's representative, i.e. Mr. Radosław Radoń, informed the local authorities that a Proxy acting on behalf of the Investor shall be Mr. Jarosław Maciaś of SWECO Engineering Sp. z o.o., 30. Wielicka Street, 30-552 Cracow. Subsequently, from 09/03/2018 Mr. Piotr Kutylński of SWECO Engineering Sp. z o.o., 30. Wielicka Street, 30-552 Cracow, was assigned as the Investor's Proxy. The power of attorney for Mr. Jarosław Maciaś was therefore withdrawn.

Required documents – as listed under Article 74 (1) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments (OJ of 2018, item 2081, as amended) – have also been filed, and they remain appendices to the application.

The subject investment task is qualified to group II of investments, which may potentially significantly affect the environment, for which it may be required to implement an environmental impact assessment, in accordance with **Article 3 (1) item 65** – *“flood defenses, except for redevelopment of flood embankments including sealing of the embankment body and its subbase, to limit the possibility of washing-out and failure during accommodation of flood water, as well as regulation of water or its channeling understood as water management allowing for its use for navigation purposes”*, and with **Article 3 (1) item 60** – *“roads with hardened course with a total investment length of over 1 km, other than ones listed under Article 2 (1) items 31 and 32, and bridge objects in an artery of a road having hardened course, except for redevelopment of roads and bridge objects used for servicing of power stations, and located beyond areas under environmental protection, as discussed under Article 6 (1) items 1-5, 8, and 9 of the Act of 16 April 2004 on conservation of nature”* – regulation of the Council of Ministers of 9 November 2010 on the investments which may significantly affect the environment (OJ of 2016, item 71, consolidated text).

The applied modification of the decision on environmental conditions for the aforementioned investment, in accordance with the investor's application, shall be necessary to obtain a decision on investment project implementation permit, as discussed under provisions of the Act of 8 July 2010 on the special preparation rules for flood protection investments; thus – in compliance with Article 75 (1) item 1 letter i) of the *EIA Act* – the unit relevant for the issuance of decisions on environmental conditions is the Regional Director for Environmental Protection in Cracow.

In accordance with Article 75 (1) item 1a of the *EIA Act* the, in case the application on the issuance of environmental decision covers at least two assignments implemented under one investment, the unit relevant for the issuance of decision on environmental conditions is the regional director for environmental protection in Cracow.

In conformity with provisions under Article 155 of the Administrative Procedure Code, in reference to Article 75 (1) item 1 letter p) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments, the unit relevant for the issuance of modified decision on environmental conditions, for the issuance of which the Regional Director for Environmental Protection was the relevant unit, shall also be the Regional Director for Environmental Protection.

In accordance with Article 87 of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental

impact assessments, in case of modifying the decision on environmental conditions, provisions under Section V shall be respectively applied.

Formally complete documentation allowed for commencing proceedings by the Regional Director for Environmental Protection in Cracow on modification of the aforementioned decision on environmental conditions. The Regional Director for Environmental Protection in Cracow informed the parties in notification dated 07/25/2018, ref. no.: OO.420.4.2.2018.BM, about commencement of the proceedings and about a possibility of acknowledging with the case documents. The subject notification dated 07/25/2018, ref. no.: OO.420.4.2.2018.BM, was successfully placed on the noticeboard of the Regional Directorate for Environmental Protection, as well as on the noticeboard of the City Office of Cracow. Furthermore, information on the commencement of proceedings was included in the Public Information Bulletin at the website of the Regional Directorate for Environmental Protection in Cracow, and also in the publicly accessible data register at the website of the Center on Information on the Environment.

Contents of the notification of 07/25/2018, ref. no.: OO.420.4.2.2018.BM, by mistake inform that the Proxy representing the Investor, i.e. the State Water Holding Polish Waters RZGW in Cracow, was Mr. Dariusz Adamek of SWECO Engineering Sp. z o.o., 30. Wielicka Street, 30-552 Cracow, whereas the actual Proxy representing the Investor was Mr. Jarosław Maciaś of SWECO Engineering Sp. z o.o., 30. Wielicka Street, 30-552 Cracow. That mistake was clarified in a notification of the Regional Director for Environmental Protection in Cracow dated 08/14/2018, ref. no.: OO. 420.4.2.2018.BM.

The list of proceeding parties for the aforementioned investment was adopted in accordance with the boundaries of implementation area and if investment impact range, in the scope of its modification. Based upon the provided site plan and extracts from the land register it was established that the number of proceeding parties exceeded 20. As a consequence, in accordance with Article 74 (3) of the Law of 3 October 2008 on access to information on the environment and its protection, public participation in environmental protection and environmental impact assessments, Article 49 of the Administrative Proceeding Code – stating notification of the parties through a public announcement – was applied.

After two substantial updates of the investment data sheet, the Regional Director for Environmental Protection in Cracow applied in the note dated 11/13/2018, ref. no.: OO. 420.4.2.2018.BM, to the State District Sanitary Inspector in Cracow and to the Ministry of Maritime Affairs and Inland Navigation in Warsaw for opinions on an obligation to provide an environmental impact assessment for the investment in question and for potential establishment of the range of report. Information on application for opinions has been placed on the noticeboard of the Regional Directorate for Environmental Protection in Cracow, as well as in the Public Information Bulletin at the website of the Regional Directorate for Environmental Protection in Cracow.

The Regional Director for Environmental Protection in Cracow has also informed the proceeding parties about a change of the Proxy. From 09/03/2018 a new proxy representing the Investor is Mr. Piotr Kutyrński of Sweco Engineering Sp. z o.o.

The Minister of Maritime Affairs and Inland Navigation – after previous call for update of the investment data sheet (dated 11/27/2018, ref. no.: DOK.DOK2.9750.14.2018.SL) – issued through the RDOŚ in Cracow (note dated 12/07/2018, ref. no.: OO.420.4.2.2018.BM) and after direct submission of clarification by e-mail by the Proxy an opinion dated 12/21/2018 (reception date: 12/21/2018), ref. no.: DOK.DOK2.9750.14.2018.SL PW: 69432, confirming that it is not necessary to provide an environmental impact assessment.

The State District Sanitary Inspector in Cracow informed its standpoint in the note dated 11/27/2018 (reception date: 12/29/2018), ref. no.: NZ-PG-420-339/18 ZŁ/2018/11/355, and stated therein that it is not necessary to provide an environmental impact assessment.

The Regional Director for Environmental Protection in Cracow issued the decision on environmental conditions dated 01/27/2017, ref. no.: OO.4233.3.2016.BM, for the investment titled **“Completion of the rehabilitation of the flood embankments of the Vistula River in Kraków: Section 1- the left embankment of the Vistula from the Wanda bridge to the Przewóz barrage, together with the backwater embankments of the Dłubnia River; Section 2 - the left embankment of the Vistula from the Przewóz barrage to Suchy Jar”**.

Due to provision of details and to establishments made on design solutions for the subject investment, the Investor applied for modification of the aforementioned decision on environmental conditions. The subject of modification is related to the following:

- *Modification of chainage provided, including division of the investment into tasks and a scale of embankment raising;*
- *Implementation of additional data on the area of properties or their parts, which would remain a part of the investment, and are necessary for its implementation, and which become properties of the State Treasury;*
- *Implementation of additional plots under impact, which is associated with inclusion of a ditch discharging water from embankment lock no. P.2.3 at chainage km 2+813 in the decision;*
- *Modification of chainage for deposits;*
- *Implementation of a provision on possible shaping of the embankment slope to the value of 1:1.5;*
- *Modification of chainage provided for particular types of typical embankment sections;*
- *Modification of provisions related to descend roads and embankment crossings in the scope of names of works, as result from the construction law and from the description of descend roads' courses, as agreed with ZIKiT;*
- *Inclusion of information associated with desilting of a ditch discharging water from embankment lock at chainage km 2+813 (in section 2), i.e. in a reach from the lock to the estuary to Vistula – it shall be desilted over a length of about 330 m, and its cross-section shall be restored;*
- *Implementation of corrective data for breaks in a membrane underneath of road bodies and culverts of MPWiK, where the culvert construction provides tightness for the embankment and for the subbase;*
- *Modification of provisions for protected areas, including protection zones of water-intakes and for protected areas of in-land water reservoirs.*

The remaining design solutions for the embankment to be redeveloped: *Completion of the rehabilitation of the flood embankments of the Vistula River in Kraków: Section 1- the left embankment of the Vistula from the Wanda bridge to the Przewóz barrage, together with the backwater embankments of the Dłubnia River; Section 2 - the left embankment of the Vistula from the Przewóz barrage to Suchy Jar*, as informed under the environmental decision issued by the Regional Director for Environmental Protection in Cracow on 01/27/2017, ref. no.: OO.4233.4.2016.BM, remain unchanged.

Changes to the aforementioned environmental decision, as applied by the Investor, are presented in details below:



- A summary of division of the investment into tasks (chainage of the embankments covered by the decision, with corresponding working chainage) and the scale of embankment rising shall be modified.

Task	Register chainage km		Working km
	Embankment km	Respective river km	Embankment km
Section 1. Left embankment of the Vistula River (from the Wandy Bridge to the estuary of Dłubnia River)	87+600	87+900	0+000
	88+800	89+040	1+142
Section 1. Left embankment of the Vistula River (downstream of the estuary of Dłubnia River)	89+640	89+640	1+142
	90+560	90+550	2+097
Section 1. Left embankment of the Vistula River (downstream of the estuary of port channel)	90+638	90+640	2+097
	91+797	91+540	3+317
Section 1. Right embankment of the Dłubnia River	0+000	0+000	0+000
	1+832	2+373	1+830
Section 1. Left embankment of the Dłubnia River	0+000	0+000	0+000
	1+220	1+609	1+263
Section 2. Left embankment of the Vistula River (from the Przewóz Barrage to Suchy Jar)	91+997	91+990	0+000
	95+162	96+680	2+875

As it is not possible to raise and close the final section of the left embankment for the River Dłubnia at the existing route, the Investor decided about: limitation of redevelopment and extension of that embankment at chainage from km 1+136 (river chainage km 1+577) to km 1+263 (river chainage km 1+609), i.e. up to the registered end of the embankment, including grading or total demolition of that reach of the embankment, which depends on obtaining the final consent from owners (private persons) of plots no. 358, 357, 354, area no. 46 – Nowa Huta; and development of a new closing embankment reaching the high bank (in the area of plots no. 510 and 624), covering all of the buildings, including those, which are currently located within the embanked area in a direct flood hazard area. The existing course of the embankment disables its rising and extension due to dense development; thus it is necessary to demolish a part of the embankment and to extend its remaining part beyond the developed area.

A design for development of the new embankment shall be done based upon a separate investment task, for which an environmental decision has already been provided. The investor declares that both investments shall be implemented simultaneously, so the same level of flood protection would be provided.

- The scale of rising for the embankments was modified, as results from correction of the chainage.

- Section 1 covers:

5. Left embankment of Vistula from the Wandy Bridge to the estuary of the River Dłubnia – max. by about 0.5 m, about 0.3 m on average (embankment raising is not expected in a reach of embankments from km 0+000 to 0+983, but only development of a membrane at the embankment crest);
6. Right embankment of Dłubnia from the estuary to the area of Ptaszyckiego Street - max. by about 1.2 m, about 0.75 m on average;

7. Left embankment of Dłubnia from the estuary to the area of Bardosa Street - max. by about 1.2 m, about 0.65 m on average;
  8. Left embankment of Vistula from the estuary of Dłubnia to the Przewóz Barrage – max. by about 1.0 m, about 0.3 m on average.
- Section 2 covers:
    - Left embankment of Vistula from the Przewóz Barrage to Suchy Jar - max. by about 1.2 m, about 0.75 m on average.
  - The planned area determined in the application was modified, and it amounts to about 79.8 ha – section 1, and about 33.7 ha – section 2. However, the area of properties or their parts, which remain a part of the investment, necessary for its implementation – becoming properties of the State Treasury or a unit of local authorities – is about 12 ha – section 1, and about 9 ha – section 2.
  - Due to necessary restoration of the existing condition of a discharge ditch from the embankment lock no. P.2.3 at chainage km 2+813 additional plots are included in the decision (register no.: 345, 347, 348, 349, 350, 351, 422, 425, 546, 547, 550 – area no. 39), and they remain within the investment impact range.
- The existing ditch discharging water through the embanked area was – due to accumulation of sediments brought by flood water in the embanked area – significantly silted and it does not allow for the proper discharge of rainfall from the embankment lock no. P.2.3 at chainage km 2+813. The lack of discharge hampers closing of the return valve of the embankment lock and forms a risk of flooding for the area beyond the embankment at the event of flood. The works shall include restoring the original cross-section of the ditch through the removal of soil deposits, rotten plants, and other pollutions. It is not planned to modify the depth or to extend the cross-section of the ditch.
- Chainage of location for particular deposits and areas of deposits no. 4, 6, and Brzegi were modified.

It was originally planned to take the soil for construction of the embankments from deposits present in the following locations:

- a) Deposit no. 1 – chainage of the Vistula River about km 82+500, right bank, embanked area – area of 3.94 ha;
- b) Deposit no. 2 – chainage of the Vistula River about km 89+500, left bank, embanked area – area of 5.59 ha;
- c) Deposit no. 3 – chainage of the Vistula River about km 86+000, right bank, embanked area – area of 2.53 ha;
- d) Deposit no. 4 – chainage of the Vistula River about km 88+900, left bank, embanked area – area of 2.01 ha;
- e) Deposit no. 5 – chainage of the Vistula River about km 91+200 right bank, embanked area – area of 1.24 ha;
- f) Deposit no. 6 – chainage of the Vistula River about km 93+700, left bank, embanked area – area of 1.18 ha;
- g) Deposit no. 7 – chainage of the Vistula River about km 85+500, right bank, embanked area – area of 1.68 ha;
- h) Deposit Brzegi, area of 3.09 ha – purchase of materials from KZEK Kraków.

However, after performing geological tests of deposits' utility for the intake of soil and after establishments made with land owners, the following deposits were left only:

- a) Deposit no. 1 – chainage of the Vistula River about km 82+500, right bank, embanked area. Due to the significant amount of waste materials deposited in the past that deposit may be used in a small part only for the intake of non-cohesive soil above the table of ground water.
- b) Deposit no. 4 – chainage of the Vistula River about km 88+900, left bank, embanked area. The deposit is made of up to 3.0 m deep layer of cohesive soil (loam and loamy sand) placed on non-cohesive soil (medium sand, dusty sand). The level of ground water is about 3.3 m below the ground level. The expected use of up to 3.0 m deep below the level of ground.
- c) Deposit no. 6 – chainage of the Vistula River about km 93+700, left bank, embanked area. The deposit is made of up to 1.6 m deep layer of cohesive soil (sandy dust) placed on non-cohesive soil (fine sand). The level of ground water is about 5.7 m below the ground level. The expected use of up to 3.0 m, including cohesive soil and non-cohesive soil.
- d) Deposit – Brzegi. The area of aggregate extraction by the Krakowskie Zakłady Eksploatacji Kruszyw. In case of layers located at surface layers soil placed in that deposit is waste (KZEK extracts non-cohesive soil and sorts it) for the extraction plant, but it would be a valuable material for the construction of a static body of the embankments. That soil shall be bought from KZEK and delivered to the embedding location. Due to the need for soil in the amount of about 300 K m<sup>3</sup>, the most of materials to be embedded shall be taken from the deposit in Brzegi.

- Information on possible grading of embankment slopes to the value of 1:1.5 has been implemented. For each type of cross-section it was adopted – as a rule confirmed with static calculations for the slope inclination – that: the grade of the riverside slope is 1:2.5, and of the landside slope is 1:2. In exceptional cases the slopes may be even graded to the value of 1:1.5 to limit the acquisition of protected land or the collision with buildings or structures.

- Information on chainage for particular types of typical sections of embankments is modified.

<b>Section 1</b>		
<b>From km</b>	<b>To km</b>	<b>Type</b>
Left embankment of Vistula from the Wandy Bridge to the estuary of Dłubnia		
0+000	0+983	Type III – no rising of the embankment
0+983	1+142	Type II
Left embankment of Vistula from the estuary of Dłubnia to the Przewóz Barrage		
1+142	2+097	Type I
2+097	3+038	Type II
3+038	3+273	Type I
3+273	3+317	Type II
Right embankment of Dłubnia from the estuary to the area of Ptaszyckiego Street		
0+000	0+429	Type II
0+429	0+439	Existing road embankment at Podbięty Street
0+439	<b>1+830</b>	Type II
Left embankment of Dłubnia from the estuary to the area of Bardosa Street		
0+000	0+363	Type I
0+363	0+394	Existing road embankment at Podbięty Street
0+394	0+835	Type II
0+835	1+136	Type II
<b>Section 2:</b>		

From km	To km	Type
0+000	0+308	Type II
0+308	1+274	Type I
1+274	1+482	Type II
1+482	1+611	Type I
1+611	1+746	Type II
1+746	1+941	Type I
1+941	2+143	Type II
2+143	2+740	Type I
2+740	2+875	Type II

- Names of descend roads and embankment crossings are modified in the scope of names of works, as result from the construction law and from the description of descend roads' courses, as agreed with ZIKiT, and from implementation of the register chainage for the embankment. Changes in the table do not modify the scope of works performed, as well as of objects developed, as listed in the original environmental decision.

Within the framework of the investment it is planned to redevelop, construct, remove embankment crossings and descend roads, and embankment culverts (locks). The planned new descend roads most often join the embankment crest with a shelf on the embankment or they remain a bypass of objects in the embankment course (e.g. existing sewerage chambers) or a link with bicycle path.

Reinforced-concrete openwork road slabs were applied for embankment crossings and descend roads, and in case of asphalt roads administered by ZIKiT in Cracow – asphalt concrete. Their application is necessary to protect the embankment crest against excessive passing over. The application of open-work slabs shall allow for simultaneous maintenance of the surface as partially permeable. Descend roads from the crest to a service shelf have a course made of voussoir.

In order to limit the area acquired by embankments of embankment crossings and descend roads – as those often are arable fields – the grade of slopes beyond the embankment was increased to 1:1.5 and within the embanked area to 1:2.

Tabulated summary of locations for the existing and for the new descend roads and crossings, according to chainage of the embankments.

No.	Embankment section	Embankment km	Existing/new descend road	Remarks
1	Vistula section 1	0+983	Existing, extended	Descend from the crest to the road
2	Vistula section 1	0+992	Existing, extended	Descend from the crest to a private plot
3	Vistula section 1	1+080	Existing, extended	Embankment crossing
4	Dłubnia right embankment	0+374	Existing, extended	Embankment crossing
5	Dłubnia right embankment	0+421	Existing, extended	Descend from the crest to the road
6	Dłubnia right embankment	0+428	Existing, extended	Descend from the crest to the road
7	Dłubnia right embankment	0+439	Existing, extended	Descend from the crest to the road
8	Dłubnia right embankment	0+487	Existing, extended	Embankment crossing

9	Dłubnia right embankment	0+697	new	Descend from the crest to the sewerage chamber
10	Dłubnia right embankment	1+045	Existing, extended	Embankment crossing
11	Dłubnia right embankment	1+188	Existing, extended	Descend from the crest to the road
12	Dłubnia right embankment	1+441	Existing, extended	Descend from the crest to a private plot
13	Dłubnia right embankment	1+712	Existing, extended	Descend from the crest to a private plot
14	Dłubnia right embankment	1+772 to 1+806	new	Descend from the crest – bypass of the sewerage chamber
15	Dłubnia right embankment	1+829	new	Descend from the crest to a bicycle path
16	Dłubnia left embankment	0+951	Existing, extended	Embankment crossing
17	Dłubnia left embankment	0+823	Existing, extended	Embankment crossing
18	Dłubnia left embankment	0+470	Existing, extended	Embankment crossing
19	Dłubnia left embankment	0+369	Existing, extended	Descend from the embankment shelf to the road
20	Dłubnia left embankment	0+357	Existing, extended	Embankment crossing
21	Vistula section 1	1+346	Existing, extended	Descend from the embankment shelf to the State Treasury's plot
22	Vistula section 1	1+433	Existing, extended	Embankment crossing
23	Vistula section 1	2+086	Existing, extended	Descend from the crest to the State Treasury's plot
24	Vistula section 1	2+097	Existing, extended	Descend from the crest to the State Treasury's plot
25	Vistula section 1	2+153	Existing, extended	Descend from the crest to the State Treasury's plot
26	Vistula section 1	2+403	Existing, extended	Embankment crossing
27	Vistula section 1	2+975	Existing, removed	Removal of the crossing

28	Vistula section 1	3+028	Existing, extended	Embankment crossing
29	Vistula section 1	3+139	Existing, extended	Embankment crossing
30	Vistula section 1	3+204	Existing, extended	Descend to the State Treasury's plot
31	Vistula section 1	3+314	Existing, extended	Descend to the plot of the Municipality of Cracow
32	Vistula section 2	0+259	Existing, extended	Embankment crossing
33	Vistula section 2	0+308	Existing, extended	Descend from the embankment shelf to the road
34	Vistula section 2	0+433	Existing, extended	Descend from the shelf to a public plot
35	Vistula section 2	0+511	New	Descend from the embankment shelf to a public plot
36	Vistula section 2	0+551	Existing, extended	Embankment crossing
37	Vistula section 2	1+030	Existing, extended	Embankment crossing
38	Vistula section 2	1+211	Existing, extended	Embankment crossing
39	Vistula section 2	1+327	Existing, extended	Descend from the crest to a private plot
40	Vistula section 2	1+327	New	Descend from the crest to the embankment shelf
41	Vistula section 2	1+429	Existing, extended	Embankment crossing
42	Vistula section 2	1+429	New	Descend from the crest to the embankment shelf
43	Vistula section 2	1+655	New	Descend from the crest to the embankment shelf
44	Vistula section 2	1+655	Existing, extended	Embankment crossing
45	Vistula section 2	1+684	Existing, extended	Embankment crossing
46	Vistula section 2	1+702	New	Descend from the

				crest to the embankment shelf
47	Vistula section 2	1+979	Existing, extended	Embankment crossing
48	Vistula section 2	1+979	New	Descend from the crest to the embankment shelf
49	Vistula section 2	2+040	New	Descend from the crest to the road
50	Vistula section 2	2+094	Existing, extended	Embankment crossing
51	Vistula section 2	2+099	New	Descend from the crest to the embankment shelf
52	Vistula section 2	2+780	New	Descend from the crest to the embankment shelf
53	Vistula section 2	2+784	Existing, extended	Embankment crossing

- Inclusion of information associated with desilting of a ditch discharging water from embankment lock at chainage km 2+813 (in section 2).

The ditch discharging water from the embankment lock at chainage km 2+813 (in section 2), in a reach from the lock to the estuary to Vistula, i.e. over a length of about 330 m, shall be desilted and its cross-section shall be restored. The works result from the hampered discharge of water from the area beyond the embankment, which may additionally disable closing of the return valve of the embankment lock. The aforementioned works shall not modify the investment's environmental impact.

- Implementation of corrective data for breaks in a shield underneath of road bodies and culverts of MPWiK, where the culvert construction provides tightness for the embankment and for the subbase.

A membrane was designed for the following sections:

- a. Section 1 left embankment of the River Vistula from km 0+008 to km 0+993, with a membrane developed from the crest towards the subbase to a depth of 6 m. Embankment body sealed using the same technology as in case of the subbase.
- b. Section 1 left embankment of the River Vistula from km 0+993 to km 1+142, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- c. Section no. 1 right embankment of the River Dłubnia from km 0+000 to km 1+180 (with a break at chainage km 0+420-0+457 after crossing Podbipięty Street), with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.

- d. Section no. 1 left embankment of the River Dłubnia from km 0+845 to km 1+136, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 3 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- e. Section no. 1 left embankment of the River Dłubnia from km 0+190 to km 0+835 (with a break at chainage km 0+359-0+397 after crossing Podbipięty Street), with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- f. Section 1 left embankment of the River Dłubnia from km 0+000 to km 0+190, with a membrane developed from the crest towards the subbase to a depth of 6 m. Embankment body sealed using the same technology as in case of the subbase.
- g. Section 1 left embankment of the River Vistula from km 1+142 to km 1+200, with a membrane developed from the crest towards the subbase to a depth of 6 m. Embankment body sealed using the same technology as in case of the subbase.
- h. Section 1 left embankment of the River Vistula from km 1+200 to km 2+097, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- i. Section 1 left embankment of the River Vistula from km 3+000 to km 3+315, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- j. Section 2 left embankment of the River Vistula from km 0+080 to km 2+870 (with a break at chainage km 1+050-1+067 for the discharge from an embankment culvert at the MPWiK's pumping station), with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.

- Modification of provisions for protected areas, including protection zones of water-intakes and for protected areas of in-land water reservoirs. The Investor applied for modification of informed distance between the investment boundaries and the closest protected site of Natura 2000 Ecological Network, and for modification of data on bodies of ground water.

Implementation and operations of the planned investment shall not adversely affect legally protected areas established based upon the Act of 16 April 2004 on the conservation of nature. The analyzed investment is located beyond the boundaries of European Ecological Network Natura 2000. The closest site – Łąki Nowohuckie PLH120069 – is located in a distance of about 1.1 km north from the closest boundary of the investment site.

In accordance with a division of bodies of ground water given in the Water Management Plan for the Vistula River Basin, the investment site is mostly located within the body of ground water BGW no. 148 (European code: PLGW2000148), and in the south-eastern area – within BGW no. 131 (European code: PLGW2000131). In case of BGW no. 148 and BGW no. 131, the quantitative status and the chemical status was determined as good and it is not under risk of not achieving the environmental objective. The environmental objective for the bodies of ground water is preventing or limiting implementation of pollution, preventing the deterioration and improvement of their status, protecting and undertaking recovery measures, as well as assuring the balance between the discharge and feeding for that water in order to achieve its good status. The remaining provisions of the decision related to the BGW remain unchanged.



The applied modification of the decision on environmental conditions would not change the adopted volume of pollution emission to the air in case of gas and dust substances, emission of pollution to water, and the volume of waste emission, as well as it would not change the volume of necessary water, raw materials, materials, fuel, and power. It is also not expected to change the applied solutions protecting the environment. Any assumptions remain coherent with the ones adopted on the stage of obtaining the decision on environmental conditions dated 01/27/2017, ref. no.: OO.4233.4.2016.BM.

Analysis of information provided in the valid IDS – in terms of conditions associated with qualification of the investment for development of an environmental impact assessment, as listed under Article 63 (1) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments – allows for stating that the applied modifications, as listed above and as results from the provision of details and from establishments made on design solutions for the subject investment, do not refer to modification of the investment locations in relation to shores, mountainous and forest areas, areas under protection, areas requiring special protection due to occurrence of plant species and animal species and their habitats, as well as natural habitats under protection – including Natura 2000 sites – where environmental quality standards have been exceeded, areas of direct protection for water intakes, areas of health-resort protection, and areas with landscape of historic, cultural or archaeological significance.

It shall be additionally emphasized that due to the type of investment, the impacts shall be of local reach, without a risk of transboundary impact. Due to the range of planned investment there is no possibility of impact accumulation, and application of natural resources, emission risk, occurrence of other nuisance, or occurrence of a serious industrial failure is minor. Implementation of the investment in question shall also not cause not reaching the environmental objectives included in the water management plan for the Vistula river-basin. All those and other required aspects determined under Article 63 (1) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments have been analyzed in details on the stage of obtaining the decision of the Regional Director for Environmental Protection in Cracow dated 01/27/2017, ref. no.: OO.4233.4.2016.BM, and they are still binding.

The applied modification of the environmental decision includes additional plots, due to the necessary restoration of the existing condition for the discharge ditch from the embankment lock no. P.2.3 at chainage km 2+813.

In case of the subject investment it is not obligatory to provide an environmental impact assessment. An analysis of materials provided along with the application on the issuance of modified decision on environmental conditions for the investment in question proved that the majority of conditions determined under Article 63 (1) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments shall not occur in case of the subject investment, and the remaining ones shall have a minor effect. As a consequence, it was stated that the planned investment shall not significantly affect the environment; thus, it is not necessary to provide the environmental impact assessment.

Considering the above, the Regional Director for Environmental Protection in Cracow, while taking into account opinions of units participating in the proceeding, stated in its resolution dated 01/04/2019, ref. no.: OO.420.4.2.2018.BM, that it is not obligatory to implement an environmental

impact assessment for the investment in question. The parties could not claim against that resolution; however, they were able to claim as an appeal against this decision only. Information on the issued resolution was placed on the noticeboard of the RDOŚ in Cracow, included in the Public Information Bulletin at the website of the Regional Directorate for Environmental Protection in Cracow, and also in the publicly accessible data register at the website of the Center on Information on the Environment.

In the note dated 01/03/2019 (reception date: 01/03/2019), ref. no.: PK/OI.15008/11/2019, the Investor's Proxy applied for deviation from application of Article 10 (1) of the Act of 14 June 1960 Administrative Procedure Code (OJ of 2018, item 2096, as amended – hereinafter referred to as the APC). The application was reasoned by stating that *"quick issuance of the subject modification to the decision on environmental conditions is necessary for purposes of the investment in question, which is to protect the citizens of Cracow against the effects of floods. The investment – due to its character – is to protect health and life of people, and to protect national business against heavy losses – especially due to bad technical condition of the existing embankments – in the scope of the assignment under application (in case of the structure's technical assessment, as well as a shortage in embankment height) and very long time of use (over 100 years) without thorough, complex modernization of objects, which do not meet technical requirements of the regulation of the Minister of Environment of 20 April 2007 on technical conditions for hydraulic structures and their location. That results in numerous leaks and damages to the embankment noted during the flood of May 2010, which form a real threat to the inhabitants, as well as remain a serious risk for such industrial plants and service providers as e.g.:*

- *Some technological facilities of the Sędzimir Smelter;*
- *Waste treatment plants in Kujawy and in Płaszów;*
- *Thermal Waste Processing Plant;*
- *Thermal-electric power station in Łęg (PGE Kraków).*

*The area under risk of flooding is inhabited by 9 K people, and 1939 buildings are placed therein, including 1817 residential buildings and 122 industrial buildings within the area of 10.87 km<sup>2</sup>.*

*If in the previous years the modernized sections of embankments protected residential estates and the historic center of Cracow mainly, sections of the embankments planned for modernization under this investment are also to protect objects strategic for the city, which affect operations within the entire city.*

*Delays in implementation of that task also remain a realistic threat to the investment (flood protection objective), due to the funding method for the task in question (World Bank), which may cause the loss of funds and stoppage of the investment for the following years."*

Considering the arguments stated above and the fact that the subject assignment is a "flood protection" investment, and lack of applications or remarks during the proceedings, notification of the parties in the mode under Article 10 (1) of the Act of 14 June 1960 Administrative Procedure Code (OJ of 2018, item 2096, as amended – hereinafter referred to as the APC) about completeness of the evidence and the possibility of commenting its contents was omitted. Therefore, in accordance with Article 10 (2) of the APC one has resigned of the rule determined under (1) of that Article, and did not provide the parties with a final notification on the collection of complete evidence, what would be associated with a potential possibility of final discussion of the parties on the collected materials and evidence.

Based upon an application of the Investor, acting through the Proxy – Mr. Piotr Kutyrński, dated 01/03/2019 (reception date: 01/03/2019), ref. no.: PK/OI/15008/12/2019, this decision has been made immediately enforceable based upon the mode under Article 108 (1) of the APC.

In accordance with Article 108 of the APC, in case of a decision against which one may appeal, immediate enforceability mode made be implemented, if it is necessary due to protection of health or life of people or for protection of the national business against heavy losses or due to other social interest or extremely overriding interest of the party.

While reasoning its application the Investor informed the overriding social interest, i.e. especially protection of the citizens of Cracow against the effects of floods. It added that the area under risk of flooding is inhabited by 9 K people, and 1939 building are placed therein, including 1817 residential buildings and 122 industrial buildings within the area of 19.91 km<sup>2</sup>. The investment – due to its character – is to protect health and life of people, and to protect national business against heavy losses – especially due to bad technical condition of the existing embankments – in the scope of the assignment under application (in case of the structure's technical assessment, as well as a shortage in embankment height) and very long time of use (over 100 years) without thorough, complex modernization of objects, which do not meet technical requirements of the regulation of the Minister of Environment of 20 April 2007 on technical conditions for hydraulic structures and their location. This results in numerous leaks and damages to the embankment noted during the flood of May 2010, which form a real threat to the inhabitants, as well as remain a serious risk for industrial plants and service providers.

It also emphasized that a delay in implementation of that task also remains a realistic threat to the investment, due to the funding method for the task in question (World Bank), which may cause the loss of funds and stoppage of the investment for the following years.

Considering the arguments stated above, the request of the Investor's Proxy on making the decision immediately enforceable was accepted, as the arguments provided refer to the rationale indicated under Article 108 of the APC.

It shall furthermore be added that in accordance with a legal statement included in the sentence of SAC dated 21 June 1999 (IV SA 1425/97), making the decision – which is to e.g. remove an obstacle in implementation of planned investment assignments – immediately enforceable cannot be considered as a violation of law.

As an obligation to perform an environmental impact assessment for the investment was not imposed, it was not necessary to assure the possibility of public participation in the proceedings, in accordance with Article 79 of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments.

Analysis of the provided application and of information on the planned investment proves that the intended investment shall not cause nuisance to the environment exceeding the standards.

As a result it was decided as given in the conclusion.

### **Instruction**

One may appeal against this decision to the General Director for Environmental Protection in Warsaw (00-922 Warsaw, 52/54. Wawelska Street) through the Regional Director for Environmental Protection in Cracow within 14 days from its serving date.

One may relinquish the right to appeal to the public administration unit, which issued the decision, in case of this decision. On the day the public administration unit received statements relinquishing the right to appeal by the last of the proceeding parties, the decision becomes final and binding.

Regional  
Director for Environmental Protection  
In Cracow  
Rafał Rostecki MSc

**Recipients:**

1. Mr. Piotr Kutyrński – Investor's Proxy,
2. Remaining parties of the proceeding notified in the mode under Article 49 APC,
3. OO.BM file.

**CC:**

1. State District Sanitary Inspector in Cracow, 15. Gazowa Street, 31-060 Cracow (epuap),
2. Ministry of Maritime Affairs and Inland Navigation in Warsaw, 6/12. Nowy Świat Street (epuap).

*Stamp charge in the amount of PLN 10.00 was paid for the issuance of this modification of the decision, in accordance with the Act of 16 April 2007 on stamp charge (i.e.: OJ of 2018, item no. 1044, as amended).*

## **NEW CHARACTERISTICS OF THE INVESTMENT**

The subject investment is located within the Municipality of Cracow, on the left bank of the River Vistula.

The planned investment includes redevelopment and extension of about 10 km long section of embankments at the River Vistula, including backwater embankment at the River Dłubnia, except for a short final section of the left embankment.

Section 1 begins at the Wandy Bridge, and then it overlaps Podbięty Street (Mogilski Forest joins it within that reach). Behind the lock, in the area of Zakarnie Street, Podbięty Street runs north on its own embankment. An independent flood embankment starts in that place. About 160 m further there is a registered beginning of the right backwater embankment of Dłubnia. It runs north and – running parallel to the River Dłubnia – reaches the area of Ptaszyckiego Street. Length of the right backwater embankment is about 1814 m.

The left backwater embankment on the River Dłubnia reaches the area of Bardosa Street. It is significantly shorter than the right one and has a length of about 1220 m, and is divided into two parts (length of about 758 m and about 462 m) before the estuary channel of the Smelter. Similarly as in case of the right one, it runs parallel to the River Dłubnia. In a distance of about 500 m from its estuary it runs south-east and turns – in registry meaning – into the River Vistula embankment. Na Niwach Street runs along the embankment in that section. The embankment crosses the newly constructed embankment of S7 road, passes the Thermal Treatment Waste Plant, and runs parallel to the Vistula River and joins the embankments of the Przewóz port channel. That section is about 1116 m long. Register course of the further sections – running between the Vistula channel and embankments of sediment tanks of the Kujawy waste treatment plant, and ending in the area of the inlet to the upstream channel of the lock at the Przewóz Barrage – starts on the other bank of the channel. This sections is about 1212 m long.

Section 2 starts in the area of the downstream abutment of the lock, runs as a curve on the high bank of the Vistula flooding terrace, and then parallel to the Vistula course, and ends – according to the register – at embankments of the Suchy Jar Stream. That section is about 2875 m long.

*The planned area determined in the application is about 79.8 ha – section 1, and about 33.7 ha – section 2. The basic scope of works shall be the works associated with redevelopment and extension of the embankments.*

*The area of properties or their parts, which remain a part of the investment, necessary for its implementation – becoming properties of the State Treasury or a unit of local self-government is about 12 ha – section 1, and about 9 ha – section 2.*

Those shall mainly be the earthworks including e.g.:

- Removal of top top-soil layer from the slopes and from the embankment crest, and from the land strip adjacent to the embankment in order to prepare the site for extension (development of embankment);
- Profiling of uncovered slopes for the earth-fill embankment (so-called stair-shaping) and ploughing of the strip of land for the purpose of extension;

- Development of a membrane in the subbase;
- Development of an earth-fill embankment – extension;
- Placement of bentomat;
- Completion of the embankment – extension;
- Placement of a transition layer made of mineral soil;
- Placement of a top-soil layer with sowing using mix of grass.

The table given below provides chainage of the embankments covered by the investment, including corresponding working chainage.

<b>Planned investment</b>	<b>Register chainage km</b>		<b>Working km</b>
	<b>Embankment km</b>	<b>Respective river km</b>	<b>Embankment km</b>
Section 1. Left embankment of the Vistula River (from the Wanda bridge to the estuary of Dłubnia River)	87+600	87+900	0+000
	88+800	89+040	1+142
Section 1. Left embankment of the Vistula River (downstream of the estuary of Dłubnia River)	89+640	89+640	1+142
	90+560	90+550	2+097
Section 1. Left embankment of the Vistula River (downstream of the estuary of port channel)	90+638	90+640	2+097
	91+797	91+540	3+137
Section 1. Right embankment of the Dłubnia River	0+000	0+000	0+000
	1+832	2+373	1+830
Section 1. Left embankment of the Dłubnia River	0+000	0+000	0+000
	1+220	1+609	1+263
Section 2. Left embankment of the Vistula River (from the Przewóz Barrage to Suchy Jar)	91+997	91+990	0+000
	95+162	96+680	2+875

As it is not possible to raise and close the final section of the left embankment for the River Dłubnia at the existing route, the Investor decided about correcting the application in question through:

- Limitation of redevelopment and extension of that embankment at chainage from km 1+136 (river chainage km 1+577) to km 1+263 (river chainage km 1+609), i.e. up to the registered end of the embankment, including grading or total demolition of that reach of the embankment, which depends on obtaining the final consent from owners (private persons) of plots no. 358, 357, 354, area no. 46 – Nowa Huta;
- Development of a new closing embankment reaching the high bank (in the area of plots no. 510 and 624), covering all of the buildings, including those, which are currently located within the embanked area in a direct flood hazard area. The existing course of the embankment disables its rising and extension due to genes development; thus it is necessary to demolish a part of the embankment and to extend its remaining part beyond the developed area.

The planned scale of rising for the embankments under the investment in question within particular sections:

- **Section 1** covers:
  1. Left embankment of Vistula from the Wandy Bridge to the estuary of the River Dłubnia – max. by about 0.5 m, about 0.3 m on average (embankment raising is not expected in a reach of

*embankments from km 0+000 to 0+985, but only development of a membrane at the embankment crest);*

- 2. Right embankment of Dłubnia from the estuary to the area of Ptaszyckiego Street - max. by about 1.2 m, about 0.75 m on average;*
  - 3. Left embankment of Dłubnia from the estuary to the area of Bardosa Street - max. by about 1.2 m, about 0.65 m on average;*
  - 4. Left embankment of Vistula from the estuary of Dłubnia to the Przewóz Barrage – max. by about 1.0 m, about 0.3 m on average.*
- **Section 2 covers:**
    - *Left embankment of Vistula from the Przewóz Barrage to Suchy Jar - max. by about 1.2 m, about 0.75 m on average.*

The subject investment is located within the Municipality of Cracow, on the left bank of the River Vistula.

In case of the designed embankment the minimum parameters were adopted as follows: crest width of about 4.0 m (except for Podbieli Street, where the width is greater and results from dimensions of the road course), grade of the riverside slope of 1:2.5 and of the landside slope of 1:2.0 (locally within short sections – 1:1.5). The maximum height of the embankment shall rise to about 5.4 m for Section 1 and to 4.6 m for Section 2.

The planned modernization of the embankments contains sealing of the embankment body according to three typical sections.

**Basic type I of typical section** includes extension of the embankment body on the embanked area's side (riverside), crest shall be hardened using gravel mix on geo-textile and breakstone, service roads shall be developed at the buttress or at the landside embankment foot (locally the road may move away from the embankment slope's basis to e.g. bypass and protect objects or habitats located within the embankment route), hardened with sand ballast on geo-textile, breakstone and voussoir for the purpose of service crossings. Section of that type shall be implemented in case of the most of the embankment sections to be redeveloped.

However, in locations where it is not possible to develop a service road at the buttress or at the slope basis (e.g. due to the lack of space for the buttress or fenced premises in a direct vicinity of the embankment colliding with the route) it is planned to apply **the so-called type II of typical section**, which differs from type I with placement of the service road on the embankment crest and with the absence of a buttress.

Furthermore, in location, where – due to environmental and conservatory reasons or the lack of space – it is not possible to perform redevelopment according to type I and II sections, **type III of typical sections was implemented**, which contains development of a membrane from the embankment crest, but using the same technology as in case of membrane arranged in the subbase for type I and II sections.

Except for the redevelopment and extension of embankments for the River Vistula, including backwater embankments at the River Dłubnia, the scope of application also covers redevelopment, protection or liquidation of the related accompanying infrastructure (embankment locks, descend roads and embankment crossings), and construction, redevelopment, protection or liquidation of the existing road infrastructure (roads, culverts, ramps – descend roads and embankment crossings), power network, gas network, IT network, water supply network and sewerage network. The planned new descend roads most often join the embankment crest with a shelf on the embankment or they

remain a bypass of objects in the embankment course (e.g. existing sewerage chambers) or a link with bicycle path.

Reinforced-concrete openwork road slabs were applied for embankment crossings and descend roads, and in case of asphalt roads administered by ZIKiT in Cracow – asphalt concrete. Their application is necessary to protect the embankment crest against excessive passing over. The application of open-work slabs shall allow for simultaneous maintenance of the surface as partially permeable. In order to limit the area acquired by embankments of embankment crossings and descend roads – as those often are arable fields – the grade of slopes beyond the embankment was increased to 1:1.5 and within the embanked area to 1:2. New descend roads most often link the embankment crest with a shelf on the embankment or remain a bypass for objects within the embankment course (e.g. existing sewerage chambers).

*Within the framework of the investment it is also necessary to restore the existing condition of a discharge ditch from the embankment lock no. P.2.3 at chainage km 2+813. As the existing ditch discharging water through the embanked area was – due to accumulation of sediments brought by flood water in the embanked area – significantly silted, it does not allow for the proper discharge of rainfall from the embankment lock at chainage km 2+813. The lack of discharge hampers closing of the return valve of the embankment lock and forms a risk of flooding for the area beyond the embankment at the event of flood. The works shall include restoring the original cross-section of the ditch through the removal of soil deposits, rotten plants, and other pollutions. It is not planned to modify the depth or to extend the cross-section of the ditch.*

The greatest impact of the planned investment on the environment shall be seen during the implementation phase. As a result of the works done and machines applied the impact shall occur in the form of emission of: gas and dust to the air, noise, waste; those however shall be temporary and reversible nuisance. Acoustic nuisance shall be associated with the construction time, and it shall stop at the completion of works. Materials shall be delivered to the investment site using public roads, and temporary engineering works shall be developed beyond the aforementioned areas of valuable habitats.

In order to minimize nuisance associated with implementation of the task in question, the Investor obliged itself to apply the following solutions protecting the environment:

- Construction works to be performed during the day, i.e. from 6.00 am to 10.00 pm;
- Any work done during implementation of the investment shall be performed under constant environmental supervision;
- It is forbidden to undertake any measures to dry the Vistula's oxbow lake in vicinity of Brzegi, as it may affect habitats of various humidity and humid habitats formed there adversely;
- Works shall not be done where valuable environmental habitats occur – riparian forests (91E0, 91F0). Those patches are usually located in a distance from flood embankments, but one shall take care in planning the works, to avoid damaging, e.g. during deliveries of construction material to the construction site. It is forbidden to set the technological roads out through or in a direct vicinity of that habitat. In case of a small distance any work associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment.
- In case of a habitat with oak-elm-ash riparian forest (91F0) at chainage km 0+250 to 0+350 of the Vistula embankment in **section 2**, the riparian forest grows on both sides of the embankment. In that case any works associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment. One is not allowed to set the



technological roads out or locate temporary backyard facilities within that habitat. Any work shall be done with high care to avoid damaging of the surrounding riparian tree-stand.

- It is forbidden to perform works, take natural materials, as well as set the technological roads out in the area of habitat of hay meadows (6510). Any works associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment.
- As a result of identifying a stand of very valuable species of hermit beetle, which is located in old, rotting willows growing at the embankment on the embanked area's side, the works at redevelopment of the embankments in that section were designed to avoid threatening to the existing stand. Relocation of the embankment shall assure the protection of the trees as well as their root system. A technological road shall be placed on the opposite side, i.e. in the area beyond the embankment. Prior to the commencement of works it was expected to protect the trees additionally against damaging and covering using protection made of straw mats and wooden fences. All of the protection works shall be supervised by an environmentalist.
- Any work shall be done to avoid drying of water pits, Vistula oxbow lakes.
- Delivery of construction materials shall be done using hardened roads.
- Delivery of loose materials shall be done using adopted vehicles (transport boxes covered with tarpaulins).
- The Contractor for the investment is obliged to inspect vehicles and construction machines in terms of technical efficiency. In case of machine failure any leakage of operating fluid and fuel shall be neutralized with relevant amount of absorbent stored at every back-up facility.
- Time of operations for diesel machines and vehicles working at idle shall be limited to the minimum through application of an effective work organization.
- Any locations of back-up facilities shall be placed beyond the area of valuable environmental habitats, and also beyond areas of medium and high ornithological value, and beyond habitats of amphibians and beavers.
- Tree trunks located within the work site or in its direct vicinity under risk of mechanical damaging shall be protected against damaging at a height not smaller than 1.5 m from the ground level, and materials shall not be stored and new delivery routes shall not be set out in a distance of 1 m from trunks of trees and shrubs,
- The area of back-up facilities, where machines and trucks would operate, shall be protected. Parts of back-up facilities, tightly insulated from the ground, shall be designated for servicing and fueling of the machines.
- Waste produced during implementation of the investment shall be segregated and selectively stored in containers or in separated sites adapted to that purpose, in conditions preventing dusting and blowing light fractions away, and preventing adverse impact on the environment; they should be consecutively taken over by units certified for their further treatment,
- Logging shall be done only beyond the hatching period for birds, i.e. from the beginning of October to the end of February. In case it would be necessary to perform an additional logging within the hatching period, the works may be done only under supervision of an ornithologist.
- Any work performed in vicinity of hatching habitats of amphibians – identified on an ongoing basis by the environmental supervisor – may be performed only at application of herpetological fencing protecting the construction site against migration of amphibians. In case of identifying specimens of amphibians, they will be caught on an ongoing basis and relocated to substitute

habitats existing in a safe distance. A list of those habitats shall be developed for an application on the issuance of derogation for measures forbidden in reference to protected species.

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