NON-SPECIALIST SUMMARY

OF THE ENVIRONMENTAL IMPACT REPORT

Construction of the S17 expressway

(Warsaw) Zakręt – Lublin – Zamość – Hrebenne (Lviv) from the borderline of the Masovian and Lubelskie Voivdeships

Sielce Interchange (near Kurów)

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Lublin, 2008
Updated March 2010

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1. General information

The undertaking consists in the construction of the S17 Expressway (Warsaw) Zakręt – Lublin – Zamość – Hrebenne (Lviv) from the borderline of the Masovian and Lubelskie Voivodeships to the Sielce Interchange (near Kurów).

The investment is one of a number of investments that may deteriorate the condition of environment and require an environmental impact report according to § 2, sec. 1, item 29 of the Ordinance of the Council of Ministers of 9 November 2004 on determining the types of project that may have a considerable impact on the environment and on the detailed conditions related to qualifying the project for drawing up an environmental impact report (Journal of Laws No. 257, item 2575 as amended).

The discussed part of the S17 expressway is entirely situated in the administrative area of the Lubelskie Voivodeship, poviats: Ryki and Puławy.

The road runs through the administrative areas of the following communes:

Commune	Section [km]	Poviat
Ryki	74+883 ÷ 80+598	Ryki
Town of Ryki	80+ 598 ÷ 84+961	
Ryki	84+961 ÷ 88+488	
Ułęż	88+488 ÷ 91+029	
Żyrzyn	91+029 ÷ 105+663	Puławy
Końskowola	105+663 ÷ 109+900	

The execution of the expressway is possible only outside of municipal developments, where due to the lack of limitations resulting from land development technical parameters of expressways can be applied and the road will be much less burdensome for the residents of adjacent areas.

The execution of the expressway will certainly improve traffic conditions. As shown in the traffic analysis, in 2010 traffic conditions on the national road will be at D freedom level (uneven traffic, limited choice of speed and manoeuvring, low driving comfort, temporary increases in intensity causing traffic disruptions). In 2030, after the completion of the expressway, traffic conditions will be at B freedom level (even traffic, speed and manoeuvring freedom limited only to a small degree).

The planned construction of a Ryki bypass on the expressway and limitation of its availability for local traffic (in association with the execution of interchanges and road crossings and roads for local traffic) will improve traffic safety and decrease the number of accidents and collisions.

2. Location and parameters of the undertaking

The discussed part of the S17 expressway is entirely situated in the administrative area of the Lubelskie Voivodeship, poviats: Ryki and Puławy.

The following developed areas are along the road:

- Niwa Babicka village,
- Stara Dąbia village,
- Ryki town,
- Moszczanka village,
- Kośmin/Strzyżowice village,
- Żyrzyn village.

The distance between the developments and the road varies. The buildings closest to the road are found on the Ryki section, where the national road is a typical, municipal street with directly adjacent buildings.

The planned expressway partially runs through forest complexes on the following sections:

- from km 89+375 to km 90+535,
- from km 95+720 to km 98+560,
- from km 99+403 to km 100+840,
- from km 101+502 to km 102+188.

From km 105+600 to km 109+900 the S17 expressway runs along a forest complex established as the Kozi Bór Protected Landscape Area. The distance from the protected area varies and is approx. 150 m.

Special attention was paid to searching for the most favourable course of the road with regard to the following areas:

a) Ryki town,
b) Natura 2000 Dolny Wieprz PLH060051 Special Protection Area,
c) The Pradolina Wieprza Protected Landscape Area,
d) The Kozi Bór Protected Landscape Area.

The individual areas have been described as follows:

Ref. a)

The existing national road runs through the town centre. It is a historic transport route (Trakt Warszawski) which was systematically extended. On this section the road is a typical municipal street without limitations of availability. It needs to be concluded that the possibilities of extending the existing route have already been exploited and the technical parameters of the existing road and method of developing the adjacent area (dense bilateral developments) prevent using the road to route the expressway.

The Local Spatial Development Plan of the town and commune of Ryki provides a bypass of the town on the eastern side.

The possibility of bypassing the town on the west was analysed in detail.

As shown in the analysis of maps and field investigation, considering national road no. 17 as reference, the western side of Ryki and the adjacent area is much more developed than the eastern part. Apart from the intensive municipal development reaching approx. 2 km from the national road, there are the following elements of development: breeding ponds along the Dęblin – Łuków railway line at a length of approx. 4 km, a forest complex along a belt of up to 2 km between the towns of Sarny (Ryki) and Dęblin, Ryki Railway Station and industrial areas concentrated near the railway station. The town of Dęblin is situated approx. 7 km from the town of Ryki. A military airport is situated between the towns of Dęblin and Bobrowniki.

Routing the expressway in a possibly collision-free manner with regard to the existing elements of land development would require going through a dense forest complex. On the section from the existing national road no. 48 to the end of the bypass the forest complex is a part of the Pradolina Wieprza Protected Landscape Area, meaning that at a length of at least 11 km there would be very significant interference with this area.

Moreover, routing the road on the western side will lead to an unfavourable way of crossing the Dolny Wieprz Natura 2000 Special Protection Area characterised by a longer section running through the Area with regard to the existing road.

In conclusion, the optimum solution is routing the S17 expressway bypassing the town of Ryki on the eastern side.

Such an assumption has been adopted for further concept works.

Ref. b)

The concept of the S17 expressway course with regard to the Dolny Wieprz Natura 2000 Special Protection Area situated in the Wieprz River Valley is the subject of particularly thorough analyses.

The existing national road no. 17 runs through the area at a length of 0.45 km and borders the Area along a length of 1.15 km.

Assuming the existing national road as a reference, the Dolny Wieprz Natura 2000 Special Protection Area is situated as follows:

- to the west of the road the Area runs within a belt of variable width at the length of 33 km, at the height of Wólka Rozwadowska leaning against the existing national road no. 19,
- to the south-western direction of the road, the Area runs within a belt of variable width at a length of 7 km, reaching the town of Bobrowniki on the outskirts of Dęblin and approaching the Vistula River.

The enclosed map presents the location of the Dolny Wieprz Natura 2000 Special Protection Area.

Considering the possibility of routing the expressway in a collision-free manner with regard to the Natura 2000 Area, it needs to be emphasised that to avoid collision with the Area the expressway would have to be moved away from the existing national road no. 17 by 33 km east, routing it in the vicinity of the existing national road no. 19, Białystok – Lublin – Rzeszów (near the towns of Wólka Rozwadowska/Wola Skromowska). Moving it outside of the borderlines of the Area to the west (at least 7 km) would require routing the road through a densely urbanised area of Bobrowniki and Dęblin. At the same time, it should be noted that moving the expressway so far from the existing corridor of national road no. 17 and routing it along an entirely new course would contribute to the strong objection of local communities.

Therefore, the S17 expressway cannot be routed in a collision-free manner with regard to the Natura 2000 Area.

Also, the TEN-T Network international corridor, in the area of which national road no. 17 and the planned S17 expressway run, was taken into consideration. It comprises an important transport route in the national perspective, but its primary significance lies in the provision of efficient connection between the most important industrial centres of the Lubelskie Voivodeship (Lublin and Zamość, Puławy and Chełm), as well as with Warsaw and central Poland. National road no. 17 and the planned S17 is at the same time a historic, established access road from these economic centres, Warsaw and central Poland to the road border crossing with Ukraine in Dorohusk, Zosin and Hrebenne.

The concept works focused on minimising the impact of the S17 road on the Natura 2000 area.

Ref. c)

The Pradolina Wieprza Protected Landscape Area is in a location close to the Dolny Wieprz Natura 2000 Special Protection Area, however, including a much wider belt of land.

The solutions aimed at maximum protection of the Natura 2000 Area protect also the Pradolina Wieprza Protected Landscape Area.

Ref. d)

The purpose of the concept works is the maximum protection of the Kozi Bór Protected Landscape Area.

The maximum distance from the Kozi Bór Protected Landscape Area, approx. 150 m, was maintained.

The following variants of the discussed road were pre-considered in the Technical, Economic and Environmental Study:

- **Variant 0** – non-investment variant, the S17 expressway runs along the line of the existing national road no. 17,

  It is not possible to adjust the existing national road no. 17 with its current course

to the parameters of an expressway without significant interference with the current developments and demolishing linear (multi-linear) dense developments in the towns of: Niwa Babicka, Ryki, Moszczanka and Żyrzyn. Thus, it is necessary to route the S12 road outside of the area of dense residential development in the towns through which it runs and at the same time route the expressway through the protected areas of the lowest possible sensitivity to the impact of such investment.

- **Variant A** – investment variant, the route of the expressway was (in general) designed on the right (western) side of the existing national road no. 17,
- **Variant A1** – investment variant; Variant **A1** was developed as part of Variant **A**, at a section crossing Ułęż commune the expressway was routed on the left (east) side of the existing national road (on other sections the road runs according to Variant **A**),
- **Variant B –** investment variant; the existing national road no. 17 is planned to be used to route the western side roadway of the expressway, while the second roadway is planned to be located on the eastern side of the existing national road,
- **Variant C –** investment variant; this variant can function both within Variant **A**, and within Variant **B**; the course of the road in this variant is characterised by lower interference with the forest areas and a greater distance from the special protection area of habitats,
- **Variant D** – investment variant; Variant **D** has been developed within Variant **A**, at a section from the borderline of the voivodeships to Ryki the expressway was routed on the eastern side of the national road, bypassing the developments of Niwa Babicka and Stara Dąbia villages (further the route runs in line with Variant **A**).

The table below presents scores for individual variants.

A 5-point scale was adopted; from the most favourable (5 points) to the least favourable solution for a particular criterion.

No.	CRITERION	VARIANT					
		0	A	A1	B	C	D
1.	2.	3.	4.	5.	6.	7.	8.
1.	Length	5	5	5	5	4	4
2.	Length of engineering facilities	1	5	5	5	4	4
3.	Length of access roads	1	4	4	1	5	5
4.	Land surface to be purchased	1	5	4	5	2	3
5.	Compliance with LSDP	5	5	5	5	1	3
6.	Collision with elements of environmental protection	4	5	5	5	2	5
7.	Occupation of protected area	5	4	4	4	2	5
8.	Percentage decrease in the surface of natural habitats	5	3	3	3	4	5
9.	Collision with elements of conservator's protection	5	5	5	5	1	5
10.	Area protected against noise within excessive range	1	3	3	3	3	5
11.	Public consultations	1	3	1	2	1	5
-	**TOTAL**	**34**	**47**	**44**	**43**	**29**	**49**

As a result of a comparison of individual variants of the expressway, it is concluded that the most favourable variants are **A** and **D**. For social and technical reasons the authors of this report recommend **Variant D.**

Considering the postulates and expectations of the local community, the recommended variant is **D.**

Basic technical parameters of the Investment:

1) S17 Expressway

Basic road parameters of the road:

- technical road class – S (expressway),

- design speed – V_p = 100 km/h,
- operating speed – V_m = 110 km/h,
- type of cross-section – mainline,
- number of roadways – 2
- number of lanes – 2 x 2 = 4, ultimately – 2 x 3 = 6,
- lane width – 3.50 m,
- roadway width – 2 x 7.00 m, ultimately – 2 x 10.50 = 21.00 m,
- emergency lane width – 2 × 2.50 m,
- ground shoulder width – 1.75 m,
- width of the roadway dividing lane – 12.00 m (including hardened belts – 2 x 0.50 m), ultimately – 5.00 m (including hardened belts – 2 x 0.50 m),
- vertical clearance – 5.00 m,
- traffic category – KR6,
- pavement load – 115 kN/axle.

2) Road interchanges

a) Ryki Road Interchange

- type of interchange – trumpet, servicing all directions,
  - number of inlets to the interchange – 3.

b) Moszczanka Road Interchange

- type of interchange – semi-cloverleaf with opposite quarters, servicing all directions,
  - number of inlets to the interchange – 4.

c) Skrudki Road Interchange

- type of interchange – flat diamond, servicing all directions,
  - number of inlets to the interchange – 4.

d) Żyrzyn Road Interchange

- type of interchange – trumpet, servicing all directions,
  - number of inlets to the interchange – 3.

e) Sielce Interchange

- type of interchange – trumpet, servicing all directions,
  - number of inlets to the interchange – 3.

3. Environmental elements within the undertaking

3.1. Geological structure

The surface geological formation in the area of Ryki and Żyrzyn are Quaternary formations of 20-40 m in thickness. A sediment complex of the fluvioglacial, glacial lake and glacial accumulation comes from the stadial of the maximum Wolstonian Stage. It is formed by fluvioglacial fine and medium-grained sands, partially with fine gravel, found in numerous places and levelling the irregularities of the surface and fluvioglacial sands with gravels, glacial till, clay and glacial lake silts, river sands and gravels. The eastern and northern part of the Żyrzyn commune is occupied by Holocene formations. These include river sands and gravels, river silts and sands and alluvial soils (the Wieprz River Valley). Eolic formations (sands and dune-forming sands).

3.2. Surface water

The discussed area is located in the catchment area of the Wieprz River and its direct tributary, the Zalesianka (from Ryki).

The Wieprz River in this area is in a vast valley with strong meandering. The annual flow of the Wieprz River in Kośmin ranges from 22.0 m^3/s to 70.0 m^3/s.

The surface of the Wieprz River catchment area is 10,415.2 km^2, including 10,230.6 km^2 up to the Kośmin water level indicator.

The Zalesianka River (from Ryki) is a small, right tributary of the Wieprz River. At a

significant distance (~8.0 km) it flows in the south-eastern direction parallel to, and at a small distance from, the planned road. The surface of the Zalesianka River catchment area is 104.0 km^2. In the valley (Ryki, Chrusty, Moszczanka) there are numerous ponds. Ponds are also located in Żyrzyn in the Duży Piotr River Valley. Moreover, there are bodies of standing water represented by numerous old river beds filled with water and old peat holes.

The water quality in the Wieprz River at this section in 2006 corresponded with Class IV (unsatisfactory). The water quality of the Zalesianka River corresponded to Class III (satisfactory).

3.3. Groundwater

The investment area belongs to the Lublin subregion. The surface formations in that area are poorly permeable (only in the Wieprz River Valley – semi-permeable). There is one, main, functional aquifer in the gaizes, marlstones and limestone of the Upper Cretaceous. The depth to the first table of groundwater increases to 5 m on the west and to 20 m on the east.

During the geotechnical works in October and November of 2007 groundwater was found in most geotechnical holes. Depending on the location of the investigated site, the table was stable or tense. The vicinity of such rivers as the Wieprz and the Zalesianka and nameless watercourses, breeding ponds and broads had a definite impact on its depth with regard to the surface level.

The southern part of the planned undertaking is located within the Main Groundwater Reservoir No. 406 (Niecka Lubelska) and the northern part within the Main Groundwater Reservoir No. 215 (Subniecka Mazowiecka). The borderline between these reservoirs runs along the route of the current Wieprz River bed. Within the MGWR No. 406 the functional aquifer is the Upper Cretaceous level, and in the MGWR No. 215 the Tertiary water level occurring mostly in the sands of the Oligocene and secondary – of the Miocene.

3.4. Mineral deposits

No documented deposits of common minerals occur in the area of the planned road. The closest existing currently exploited deposit is situated approx. 600 m away in Sierskowola. It is a deposit of natural aggregate.

There are areas of forecast resources of peat deposits, natural aggregate and clay materials for the production of construction ceramics.

Peat deposits of subeconomic resources are found:

1) between Moszczanka and Sierskowola
2) north from Chrustne
3) to the east from Ryki Królewskie.

There is a potential area of deposits of natural aggregate between Brzezinka and Chrustne. The resources of this aggregate are estimated at 900,000 tonnes; these are mostly sands for construction works. No documentation in at least category C_2 to apply for a licence to exploit the deposit has been prepared yet. The areas of potentially possible exploitation of natural aggregate closest to the planned road are found in the area of:

1) Zalesie (approx. 2,000 m)
2) Kolonia Swaty (approx. 2,500 m)
3) Brzeziczka (approx. 200 m)
4) Kośmin (approx. 1,200 m)
5) Cezaryn, Parafianka, Jaworów (approx. 500 m)
6) Borysów. (approx. 1,200 m)

Moreover, north from Żyrzyn at a distance of approx. 1,000 m there is a deposit of clay materials of subeconomic resources.

3.5 Air

According to the available materials (including: The Report on Environmental Conditions in the Lubelskie Voivodeship in 2004 – WIOŚ Lublin July 2005) presenting the assessment results of air conditions in the Lubelskie Voivodeship in recent years, it may be concluded that the values of maximum levels of individual contaminants are much lower than the permissible values.

3.6. Acoustic climate

Noise measurements were performed to determine the acoustic background. The results and calculations show that the permissible noise level both for day and night-time is exceeded at all points.

3.7. Animated nature

The vegetation and landscape includes typical elements for extensively used lowland areas and lowland river valleys.

In the northern part (borderline of the voivodeship – Ryki) the investment is situated in an agricultural landscape with a low proportion of forests. From km 81+000 in the north-eastern direction from Ryki behind Sarny (km 90) the road runs in an agricultural landscape with a distinctly greater proportion of forests and meadows. The proportion of damp habitats is associated with the Zalesianka River Valley (right-bank tributary of the Wieprz River).

The investment crosses Pradolina Wieprza in its eastern part. The bottom of the valley is relatively narrow – approx. 1 km. Within the ice-marginal there is a distinct elevation (Strzyżowice) and near the village of Skrudki there is the southern borderline of the ice-marginal valley.

The southern part of the investment in the area of the Lubartów Plain crosses an extensive agricultural landscape. In contrast to the central and northern part, there are also greater forest areas.

Due to the geological surface, the botanical landscape in the investment area can be described as coniferous and partially alluvial forests (in river valleys).

Due to the dominant use of the land as arable land, pastures and development areas, the vegetation is mostly synanthropic: segetal (fields, fallow land), ruderal (hard shoulder, developed areas). Only in the Wieprz and Zalesianka Valleys and in the forests is there semi-natural vegetation typical of extensively used river valleys and economic forests.

There are not many protected or rare species of plants in the area adjacent to the planned investment. Stands can be found mostly in the Wieprz River Valley near Strzyżowice, Kośmin and Sarny

The area outside of the Wieprz River Valley is poorly populated with rare species.

The alder buckthorn *Frangula alnus* (partially protected), a part of brushwood and forests, is a common species.

The investment area is diversified with regard to fauna habitats. The Wieprz River Valley is dominated by meadows of a varying degree of transformation and dampness. There are old river beds and periodically flooded or damp depressions forming an attractive site for numerous species of animals, including birds.

In the southern and eastern part of Ryki there is a complex of fish ponds of special importance for many species of birds, both breeding and birds of passage. Other pond complexes have a significantly lower importance.

The section of the Wieprz River crossed by the investment is only slightly covered with brushes. There are no greater avenues of arborescent plants. There are birds characteristic for the entire valley of the Wieprz River which runs through fields and wasteland.

The fauna of agricultural land and areas of rural developments is distinctly poorer and less diversified from that in other areas.

A particular role in the maintenance of biological diversity is played by water reservoirs and marshy land. There are many species of fish in the Wieprz River and

ponds.

The ponds, old river beds and the meadows of varying degree of dampness are places of high importance for amphibians.

The mammals are typical of agricultural areas of the Polish lowland.

The main refuges for large ungulates can be found in the southern part of the area in larger forests near Żyrzyn and in the Wieprz River Valley.

In the area of the planned investment numerous bat species have been observed.

In the area of the investment invertebrate fauna is not recognised in detail. Studies were performed only with regard to the species of insects listed in Appendix 2 of the DS. Only one species of butterfly was observed: Large copper (*Lycaena dispar*).

Observed protected species include the Ground beetle (*Carabidae*) and bumblebee (*Bombus*). Due to the lack of a permit for live catching, it was not possible to recognise the species.

3.8. Protected areas

In the area of the planned undertaking, there are the already established Kozi Bór and Pradolina Wieprza Protected Landscape Areas and a Natura 2000 area.

The Kozi Bór Protected Landscape Area occupies the surface of 12,681 ha. In the western part the area is occupied by the Kozi Bór Forest, and the borderline of the area runs along the borderline of the forest near national road no. 17 from km 105+600 to km 107+900. The closest vicinity of the planned road to the Kozi Bór Protected Landscape Area is 150 m.

The Pradolina Wieprza Protected Landscape Area occupies 33,159 ha and covers a vast ice-marginal valley of the lower course of the Wieprz River. It is situated in the communes of: Puławy, Żyrzyn, Ryki, Ułęż, Jeziorzany, Baranów, Michów, Kock and Firlej. The eastern edge of the area reaches the Firlej – Kock road.

On the section:

- Variant A – from km 89+360 to km 102+210 (length – 12.85 km),
- Variant D – from km 89+490 to km 102+340 (length – 12.85 km), the designed investment crosses the Protected Landscape Area.

On the section:

- Variant A – from km 98+550 to km 99+680 (length – 1.13 km),
- Variant D – from km 98+670 to km 99+800 (length – 1.13 km), the designed investment borders on the PLA.

Pradolina Wieprza, apart from landscape protection, is subject to protection as the Dolny Wieprz Natura 2000 PLH060051 Special Protection Area (approved on 1 December 2008). Surface: 8,182.3 ha.

On the section:

- Variant A – from km 90+460 to km 91+110 (length – 0.65 km),
- Variant D – from km 90+580 to km 91+230 (length – 0.65 km), the designed investment crosses the SPA.

On the section:

- Variant A – from km 92+500 to km 93+650 (length – 1.15 km),
- Variant D – from km 92+620 to km 93+770 (length – 1.15 km), the designed investment borders on the SPA.

4. Types and degree of environmental impact of the planned undertaking

The road construction may generate environmental impact. The impact includes:

1. Permanent road structure situated on the land – decreasing the land surface and creating a discrepancy in the landscape

The road construction, which is a linear investment, will become a permanent part of the surroundings. Due to the richness of the landscape it will be necessary to transform the land through embankments and excavations. Also, in locations of road crossings and interchanges elevated bodies of the crossing roads will be necessary.

The construction of the road along the new route will be associated with a noticeable impact on the ground and soil. The impact during the construction and later operation will be permanent land occupation for the body of the main road, as well as the technological and collective roads.

The entire surface of the roadway is:
- in Variant **0** – 119.4 ha,
- in Variant **A** – 351.2 ha,
- in Variant **A1** – 351.1 ha,
- in Variant **B** – 350.9 ha,
- in Variant **C** – 352.6 ha,
- in Variant **D** – 352.4 ha.

2. Impact on climate in the area of the investment – evaluated as negligible for both variants of the road,

3. Possible disturbance of water relations and contamination of surface water

The basic method of draining the road is surface drainage where water running off the body of the road (whose elements are appropriately sloped horizontally and transversely) are directed to roadside ditches, dished or trapezoidal. Sediment traps for the sedimentation of suspensions are planned on outlets of the ditches. The ditches are introduced into receiving bodies, i.e. existing water courses. Within the interchanges and bridges the water will be drained to the rainwater sewage system and through pre-treatment devices into natural receiving bodies. The rainwater runoff is characterised by uneven quantity and quality depending on the intensity of traffic, season and time of day. It may form highly contaminated sewage, especially after a longer period of dry weather, as a result of high accumulation of contaminants on the surface and snow removed from the hard shoulder.

4. Impact on flora and fauna

As shown by the natural inventory, there are a number of rare and protected species and habitats in the area of the planned undertaking. The analysis of environmental impact of the planned investment shows that the main hazard for vegetation is direct impact during the performance of the undertaking. In this period, as a result of a direct collision or the performance of works valuable ecosystems may be partially or entirely destroyed. This may have an indirect impact on protected species of birds nesting in these ecosystems.

A direct impact on the flora and fauna during the execution of the investment applies especially to:

- threat to the stands of: the Floating fern, Yellow water-lily, Wolffia arrhiza (the Wieprz River Valley, Variants **A1, B**)

- disruptions in the movement of amphibians and reptiles during the construction

- hazard for the stand of the Large copper *Lycaena dispar* in the Zalesianka River Valley (Variant **C**)

The performance of the investment in Variants A, A1, B, C and D decreases the surface of natural habitats and their quality:

3150 – Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* – type vegetation;

6430 – Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels;

6510 – Lowland and mountain hay meadows extensively used.

The defect is minor and should be considered insignificant. The evaluation is based on the following premises:

a) size of defects against the resources in the Natura 2000 area is very small and does not exceed 0.2%;

b) size of defects against the resources in the region and voivodeship is minor;

c) condition of habitats to be destroyed is far from optimum and may be described as degenerative (national road no. 17 continues to impact the habitats)

Moreover, the execution of the road requires clearing approx. 60.0 ha of forests. The forests belong to the State Treasury (Puławy Forest District) or private owners. The natural condition of these forests can be evaluated as follows:

- tree stand: simplified with regard to the species, composition different from the habitat type, presence of foreign species, of the same age, partially with gaps;
- underbrush: simplified with regard to the species, large share of foreign elements (the Black cherry);
- undergrowth: degenerated, simplified, with foreign elements;
- abiotic conditions: continuous emission of gas and dust contaminants, locally high contamination of the soil with waste and faeces.

In conclusion, the condition of forest phytocenoses in the direct vicinity of national road no. 17 is low.

The performance of the investment will decrease the contamination of water and soil compared to the current condition. On bridges, it is planned to use a rainwater sewage system with sewage drainage by sets of pre-treatment devices.

The degree of impact on the Natura 2000 area is similar in all variants of the investment. A significant argument against Variant C is introducing into the valley a new anthropogenic linear structure at the length of 520 m which will increase the barrier effect and decrease the integrity of the area.

At the operational stage the impact of the undertaking on the flora and fauna will be minor.

5. Hazards related with the impact on living conditions and human health:

5.1. Contamination of air as a result of exhaust gases which, according to the calculations, exceed the permissible standards only within the borderlines of the planned roadway.

5.2. Noise emission – calculations indicate that on the borderline of the roadway the noise level exceeds 60 dB by day and 50 dB at night.

The noise emission for Variants **A** and **D** is similar as they mostly overlap. The analysis of noise impact shows that there are individual buildings or groups of buildings where permissible noise standards are exceeded.

For Variant 0, permissible noise levels are exceeded in Ryki along the developments. The

values will remain exceeded (after the execution of the investment) but the noise level will be significantly lower.

5. Waste management

Based on the Technical, Economic and Environmental Study of the undertaking, pursuant to the Act of 27 April 2001 on Waste and the Ordinance of the Minister of the Environment of 27 September 2001 on the catalogue of waste, it is expected that the impact of the undertaking includes generating waste at the construction stage related with building the new road and performing required demolitions. Similar waste will be generated for each variant. There will be differences in the quantity of waste from demolitions due to the fact that the number of buildings (of different sizes) to be demolished varies. The lack of their qualitative assessment does not allow specifying at this point an accurate amount of waste that will be generated during the execution.

Detailed information on the emissions can be presented at the stage of preparing a construction design.

Below is a list of the generated waste with the group of demolition waste:

Implementation stage				
No.	**Waste type**	**Code**	**Quantity [Mg/year]**	
			Execution of the road	
1	paper and cardboard packaging	15 01 01	0.02	
2	wooden packaging	15 01 03	0.04	
3	multi-material packaging	15 01 05	0.04	
4	waste from repairs and reconstruction of roads (stone aggregate, possibly granite brick) – without asphalt	17 01 81	8,000	
5	asphalt from the surface (destruct) – asphalt other than mentioned in 17 03 01	17 03 02	620	
6	iron and steel	17 04 05	2	
7	Soil, including stones other than those mentioned in 17 05 03	17 05 04	650,000	
8	other not mentioned waste (earth from drilling for foundation stilts)	01 05 99	20,000	
9	Waste vegetation mass	02 01 03	60	
		Demolition of buildings, Variants A, A1, B, C		**D**
1	concrete waste and concrete rubble from disassembly and renovation works	17 01 01	390	200
2	brick debris	17 01 02	390	190
3	waste from other ceramic materials and fittings	17 01 03	110	75
4	wood	17 02 01	40	30
5	glass	17 02 02	4	2
6	tar waste	17 03 80	20	9
7	metal mixtures	17 04 07	10	5
8	insulation materials with asbestos	17 06 01*	50	20

Note: code number – denotes hazardous waste*

The table includes waste from the disassembly of roof covers (tar, sheet metal, eternit) considering them as a roof-insulating, not construction materials.

Materials that can be used, such as:

- surface millings (17 03 02)
- metal elements – support structures, boards of road signs, protective barriers (17 04 05)
- waste from renovation and reconstruction of roads without asphalt (17 01 81)

are planned to be moved to the Material Base of the National Road Region and thus, the following will be recovered (R14):

- millings as an additive for the manufacturing of bituminous mass
- waste from the renovation and reconstruction of roads (without asphalt) after disintegration as road foundations
- metal elements to be used for own purposes or handed over to an authorised recipient.

It is also planned to transport wood to the Material Base of the National Road Region to be used for the manufacturing of lumber.

Removed soil and earth, organic soils from the sections of soil replacement and soils from the drillings for silt foundations of the flyover will be used to form embankments and as humus for the sowing of embankments and excavations.

Materials from the demolition of buildings will be managed by the Contractor. Apart from glass and asbestos-containing waste all types of waste from building demolitions can be handed over to individuals.

All waste can be used, provided it is disintegrated.

Due to its properties, hazardous waste containing asbestos is especially hazardous to humans and the environment at the moment of disintegration. Thus, asbestos-containing elements, i.e. asbestos and cement materials should be removed, packed and transported to designated storage locations by specialist companies with specially trained staff.

According to the Act on Waste, the generator shall use such methods of manufacturing or types of services and manufacturers of raw materials and materials which prevent the generation of waste or allow maintaining their amount at the lowest possible level and reduce the negative environmental impact. In the case of a road investment, the waste generator is the contractor, who is responsible for managing the waste generated during the construction by its maximum use or handing over to specialist companies for recovery or utilisation.

At this stage of construction it is required to control the accuracy of waste management.

<u>It is estimated that during the operation of the analysed road the following types of waste may be generated:</u>

- used mercury-containing light sources 20 03 01 – 0.2 Mg/year
- used light fixtures 16 02 16 – 0.3 Mg/year
- *waste from rainwater reservoirs* 13 05 08*– 5 Mg/year
- mixed municipal waste 20 03 01– 1.5 Mg/year
- street and yard cleaning residues – 20 03 03 – 30.0 Mg/year.

Detailed information on the emissions can be presented at the stage of preparing a construction design.

The waste generated at the stage of operation is planned to be temporarily stored at the Material Base of the National Road Region and systematically handed over to authorised

recipients. The waste from separators will be collected by the entity providing separator cleaning services.

Waste, including hazardous waste, may also be generated as a result of accidents or chance events. The following waste may be generated:

- showing hazardous properties 16 81 01* – 0.3 Mg/year
- not showing hazardous properties 16 81 02 – 0.8 Mg/year

The waste is to be collected by a specialist company.

The moved earth masses from excavations are not to be contaminated with oil-derivative substances.

In connection with Art. 2 of the Act on Waste earth masses generated during the implementation of the investment are not subject to the provisions of the act, if a decision on the conditions of building and development of the land or on the construction permit specifies the conditions and method of their management. Thus, at the stage of the construction design detailed conditions and method of managing earth masses shall be specified for the decision on construction permit to include a relevant provision on the management of earth masses generated during the implementation of the undertaking.

Provided the compliance with rules of proper waste management, its environmental impact will be minor. With the procedures resulting from the Environmental Law Act and the Waste Act and secondary legislation the use of additional protective measures will not be required.

6. Trans-border impact

There will be no environmental trans-border impact of the undertaking.

7. Risk of social conflicts

The risk of social conflicts for the investment is low. The currently applicable regulations (especially with regard to environmental protection) ensure the community's participation in the proceedings. Everyone has the right to submit remarks and applications in these proceedings.

At the stage of launching the process of investment preparation the Investor, the General Directorate of National Roads and Motorways organised public consultations to identify the needs of local communities related with the planned investment.

The consultations consisted in displaying the design materials in offices of local administrative authorities with relevant announcements in the press and on the website of the Lublin branch of the General Directorate of National Roads and Motorways. Additionally, information meetings with local governments, various institutions and residents were conducted. As a result of the public consultations, a number of remarks, opinions and suggestions with regard to the proposed design solutions were submitted. The presented remarks and requests are mostly taken into consideration in the design documentation.

This does not mean there will be no social conflicts, but the risk in individual cases is minimal.

8. Description of expected measures taken to prevent, limit or compensate for negative environmental impacts

The Environmental Protection Law Act states that transport lines shall be routed and executed in a way to ensure limitation of their environmental impact, including the protection of landscape value and possibility of movement for wildlife. The performance of an investment depends on the economical use of land during the preparation and execution of the investment. The Investor shall provide environmental protection during the construction

works at the construction site, including the protection of soil, greenery, natural topography and water relations. It is permitted to use and convert natural elements only in so far as is necessary in the execution of a particular investment. The forecast activities that may prevent, limit or compensate for the negative environmental impact are presented below.

8.1. Landscape, ground surface, vegetation

The following are indicated as the basic activities protecting the landscape, land surface and climate:

- **Harmonious introduction of road structures into the landscape of the Wieprz River Valley** by building a flyover in the line of the expressway to fulfil the following functions: crossing the Wieprz River, lower crossing for animals and crossing over commune road no. 107444L. Effects: minimisation of the transverse barrier in the river valley, reducing the surfaces of occupied natural habitats and decrease in their value, possibility of animal movement.
- **Harmonious introduction of road structures into the landscape of the Zalesianka River Valley** by building a flyover in the line of the expressway to fulfil the following functions: crossing the river valley and bed and a lower crossing for animals. Effects: minimisation of the transverse barrier in the river valley, reducing the surfaces of occupied natural habitats and decrease in their value, possibility of animal movement.
- **Maximum limitation of impact during construction** in the Wieprz River Valley by using technological roads located within the planned roadway, optimisation of transport work and proper organisation of works. Elimination of sewage from construction machines and devices, piling for the foundation of bridge supports in a way to prevent contamination of groundwater, ground replacement to ensure the level of groundwater outside of the ring road not changed in a significant manner after the construction. Effects: elimination of the risk to stands of protected species, reduction in defects in the feeding surface and potential nesting sites.
- **Reclamation of areas interfered with during the works** in compliance with the nature of the habitat: plantings of trees and brushes near the forest, restoration of meadow plants. The selection of plant species should be performed within the greenery design, taking account of the location of plantings with regard to the finally designed road elements. The selection of species should be based on the origin criterion: only local species, or its forms and varieties should be used. Due to the potential invasive character of foreign species, they should be excluded. The species of trees most often used for plantations within a roadway include: lime, maple, ash, sycamore and elm.

  Effects: reduced transition zone between the natural habitat and an anthropogenic structure, decreased surface of natural habitats of lower quality, reduced defects in the feeding surface and potential nesting sites.
- **Construction of a road water drainage system to ensure the pre-treatment of water to enable its removal to receiving reservoirs -** use of the rainwater sewage system on sections, flyovers and other bridge-like structures with sewage drainage by means of pre-treatment device sets. Effects: decreased amount of contaminants drained to the receiving reservoirs, including the Wieprz and Zalesianka rivers.

8.2. Surface water and groundwater

The following activities are used to protect surface water and groundwater and maintain water relations in an area:

- **Construction of bridges and culverts in places of existing water courses. Construction of a road water drainage system to ensure the pre-treatment of water to enable its removal to receiving reservoirs.**

The basic and sufficient method of pre-treating water from total suspended solids is the use of grass ditches. Clarifiers are planned at outlets of ditches to receiving reservoirs.

The location of rainwater and meltwater receiving reservoirs from drainage devices is presented in the table below.

Device/type of receiving reservoir	Range of location Variant A	Range of location Variant D
grass roadside ditches/existing drainage ditches, Zalesianka River, Wieprz River	entire discussed section	entire discussed section
rainwater sewage system/drainage ditches without name or chainage	83+050.00 ÷ 83+450.00	83+171.48 ÷ 83+571.48
	96+840.00 ÷ 98+580.00	96+961.48 ÷ 98+701.48
	101+013.91 ÷ 102+173.38	101+135.39 ÷ 102+294.86
drainage reservoirs/rainwater sewage system mentioned above	96+840.00 / left side and	96+961.48 / left side and
	102+173.38 / left and right side [2x300 m^2]	102+294.86 / left and right side [2x300 m^2]

It is suggested to perform the drainage of rainwater and meltwater in Variants A, A1, B, C in a similar manner.

- The presented method of rainwater drainage guarantees the reduction of contaminants in the total suspended solids to the level allowing for drainage to the surface water or ground. With the forecast traffic intensity, contamination with oil-derivative hydrocarbons will be below the permissible level. Thus, no treatment devices are necessary to be designed. Despite that, on long bridge-like structures (flyovers), it is planned to use a rainwater sewage system with sewage drainage by sets of pre-treatment devices. This applies especially to the Wieprz River, the Zalesianka River and road interchanges where the outlets of the sectional rainwater sewage system drain rainwater sewage directly to the receiving reservoirs and natural treatment in the ditches is not possible. An accurate location is the inlets of rainwater sewage system will be determined in the construction design. It is planned that the rainwater drainage to the Zalesianka River will be performed at approx. km 10+665 and 3+950 of the river, and to the Wieprz River at approx. km 17+900. Other receiving reservoirs, drainage ditches and nameless watercourses have no determined chainage
- **The performance of construction works related with the undertaking ensuring the protection of surface water and groundwater:** elimination of substance leaks

from construction machines and devices, piling for the foundation of bridge supports in a way to prevent contamination of groundwater.

8.3. Fauna

In the case of the road implemented to Variants A1 and B the following stands may be occupied: Floating fern *Salvinia natans*, Yellow water-lily *Nuphar lutea*, *Wolffia arrhiza*. In the case of Variant C the stand of Large Copper *Lycaena dispar* may be occupied. The course of the road for both variants (A and D) does not cause any significant impact on the flora and fauna. However, the following guidelines should be considered to mitigate the actual impact on the environment:

1. at the section at Akm 105+600 to Akm 107+900 (Dkm 105+721.48 to Dkm 108+021.48) the road runs in the vicinity of the Kozi Bór Protected Landscape Area. In this area (at Akm 106+500 /Dkm 106+621.48/) an upper crossing for animals was planned, thus no parking spaces or lots should be situated at this section.
2. parking spaces and lots should not be situated in the area of upper crossings for animals, i.e. in the area of Akm 96+650 and Akm 102+050 (Dkm 96+771.48 and Dkm 102+171.48).

1. To enable migration the following crossings for animals are planned:

Only for Variant A

77+790.00	lower medium crossing for animals 10.0 m x 2.5, relative tightness indicator 0.7

For Variant A and D, respectively

Location Variant A	Location Variant D	Description of crossing
81+323.80	81+445.28	lower large crossing for animals, clearance of supports > 20.0 m; h > 5.0 m
85+528.52	85+650.00	lower medium crossing for animals, 12.2 m x 5.0 m, relative tightness indicator >1.5 (at the stage of the construction design it is recommended to widen the crossing to 17.5 m)
87 + 741.52	87+863.00	lower large crossing for animals (crossing for animals within the planned flyover on the Zalesianka River) 20 m x 3.5 m
89+700.00	89+821.48	lower large crossing for animals >15.0 m x 3.5 m, relative tightness indicator 1.5
91+029.38	91+150.86	lower large crossing for animals (the Wieprz River), clearance of supports > 20.0 m; h > 5.0 m
92+350.00	92+471.48	lower large crossing for animals >15.0 m x 3.5 m, relative tightness indicator 1.5
95+250.00	95+371.48	lower small crossing for animals 2.0 m x 1.5 m, relative tightness indicator 0.07
96+650.00	96+771.48	upper large crossing for animals, at least 35.0 m in width
98+553.52	98+675.00	lower large crossing for animals >18.2 m x 5.0 m, relative tightness indicator E >1.5
102+050.00	102+171.48	upper large crossing for animals, at least 35.0 m in width (at the stage of the construction

		design it is recommended to widen the crossing to 50 m)
103+991.61	104+113.09	lower large crossing for animals, clearance of supports > 20.0 m; h > 5.0 m
105 + 100.00	105+221.48	lower large crossing for animals >15.0 m x 3.5 m, relative tightness indicator 1.5
106+500.00	106+621.48	upper large crossing for animals, at least 35.0 m in width (at the stage of the construction design it should be considered to widen the crossing to 80 m and include the collector roads)

The parameters of crossings for animals have been selected based on the paper entitled "Zwierzęta a drogi – Metody ograniczania negatywnego wpływu dróg na populacje dzikich zwierząt," Issue II, the Mammal Research Institute of the Polish Academy of Sciences, Białowieża 2006, Włodzimierz Jędrzejewski and others.

To ensure appropriate migration belts for amphibians and small mammals outside of these facilities culverts with appropriate shelves elevated above the normal water level with the following locations (Variant A and D) are planned:

No.	Km Variant A	Km Variant D	Culvert clearance [cm]
1.	80+732.64	80+853.14	1 Ø 150
2.	83+051.69	83+173.17	1 Ø 150
3.	84+244.69	84+366.17	1 Ø 150
4.	87+944.00	88+065.48	1 Ø 150
5.	89+267.46	89+388.94	1 Ø 150
6.	93+541.48	93+662.96	2 Ø 150
7.	96+840.00	96+961.48	1 Ø 150
8.	101+013.91	101+135.39	1 Ø 150
9.	102+173.38	102+294.86	1 Ø 150
10.	103+592.66	103+714.14	1 Ø 150
11.	105+284.82	105+406.30	3 Ø 150
12.	107+637.99	107+759.47	1 Ø 150
13.	108+545.00	108+666.48	2 Ø 150
14.	109+829.18	109+950.66	2 Ø 150

2. To minimise the losses in the populations of species, the areas adjacent to the ring road should remain as undisturbed as possible. The current management should be maintained. The recommendation applies especially to meadows and small peat lands.
3. To minimise the barrier effect of the planned S17 road for the development of amphibian populations listed in the Habitat Directive (Council Directive 92/43/EEC) as species from Annexes II (requiring the designation of special protective areas) and IV (requiring strict protection) and to maintain the genetic contact of protected amphibian species residing in ponds, old river beds and surrounding meadows, guiding fences for amphibians should be designed near the designed culverts. The fences should be of at least 0.5 m and C-shaped. The fences will reduce the mortality of amphibians on the road during the reproductive and trophic migration periods and will reduce the barrier

effect of the existing road for the population of other animals.

4. Large crossings for animals should be designed in a way for the abutments to be covered with a layer of earth and soil and ultimately reinforced with grass plants.
5. Concrete escarpments should be avoided to reinforce embankments,
6. All embankments should be incorporated into the surroundings in a way for the facilities to be least visible.

Culverts for Variants A1, B and C were designed appropriately on the same watercourses by projecting the location from Variants A and D.

8.4. Air

Due to the scope of impact of contaminants from traffic indicated in the analysis and limited to the planned roadway, no measures preventing, mitigating or compensating this impact are indicated.

8.5. Noise emission

The conducted calculations of forecast distribution of noise emission showed that the permissible noise level may be exceeded for a few residential buildings, requiring appropriate protective measures. **An efficient acoustic protection measure will be acoustic screens which will eliminate the negative impact of the investment**. They will be covering the noise source, i.e. the road, for the sound wave not to travel directly into the building. The screen should be at the same time considered as an element of space development influencing e.g. its perception by users.

Acoustic insulation of the screen (the degree of penetration of its structure by sound) should be no less than 20 dB, in general. Such insulation is ensured by special, attested structures of materials and panels for the construction of screens.

Location of acoustic screens

The screens have been calculated for night-time with the forecast traffic intensity for 2025. The screens were planned at a distance of 4.0 m from the roadway edge. Houses near the road are usually single-storey of the average and adopted height of 7 m. The calculations of screening efficiency of the developed areas was performed to check the feasibility of this method of mitigating the acoustic hazard. It was assumed that the height of the screen is that which provides an acoustic shadow at 7 m over the roadway surface with the noise emission level below the permissible level of noise (at night) at the first line of developments and up to 50 m behind the first development.

Suggested locations of acoustic screens for Variant A

No.	Starting point of the screen [km]	End point of the screen [km]	Side of the road	Screen length [m]	Screen height [m]
1.	76+600	76+800	eastern	200	5.0

2.	76+700	77+200	western	500	5.0
3.	76+900	77+500	eastern	600	3.0
4.	78+000	78+500	eastern	500	5.0
5.	78+100	79+100	western	1,000	5.0
6.	0+250	0+450	slip road	200	5.0
7.	80+500	80+800	eastern	300	5.0
8.	80+500	80+700	western	200	4.0
9.	81+000	81+530	western	530	4.0
10.	81+700	82+500	western	800	4.0
11.	81+950	82+700	eastern	750	5.0
12.	82+800	83+600	western	800	5.0
13.	83+150	83+500	eastern	350	3.0
14.	83+800	84+300	eastern	500	3.0
15.	85+200	86+350	western	1,150	5.0
16.	85+350	85+550	eastern	200	5.0
17.	85+615	0+050 *(slip road)*	eastern	1,647	3.0
18.	0+100 *(slip road)*	88+000	western	806	5.0
19.	88+100	88+200	eastern	100	4.0
20.	89+950	90+300	eastern	350	5.0
21.	91+380	91+750	eastern	370	5.0
22.	94+800	94+950	western	150	4.0
23.	100+500	101+440	eastern	940	3.0
24.	103+500	104+165	eastern	665	5.0

Suggested locations of acoustic screens for Variant D

No.	Starting point of the screen [km]	End point of the screen [km]	Side of the road	Screen length [m]	Screen height [m]
1.	76+400	76+900	western	500	5.0
2.	76+600	77+300	eastern	700	5.0
3.	77+500	78+000	western	500	4.0
4.	78+130	78+625	eastern	495	5.0
5.	78+500	78+700	western	200	4.0
6.	80+500	80+800	eastern	300	5.0
7.	80+500	80+700	western	200	4.0
8.	81+125	81+655	western	530	4.0
9.	81+825	82+625	western	800	4.0
10.	82+080	82+830	eastern	750	5.0
11.	82+925	83+725	western	800	5.0
12.	83+270	83+620	eastern	350	3.0
13.	83+930	84+430	eastern	500	3.0
14.	85+320	86+470	western	1,150	5.0
15.	85+470	85+670	eastern	200	5.0
16.	85+735	0+050 *(slip road)*	eastern	1,647	3.0
17.	0+100 *(slip road)*	88+120	western	806	5.0
18.	88+220	88+320	eastern	100	4.0
19.	90+070	90+420	eastern	350	5.0
20.	91+500	91+870	eastern	370	5.0
21.	94+925	95+075	western	150	4.0
22.	100+620	101+560	eastern	940	6.0
23.	103+620	104+285	eastern	665	5.0

Despite being specified for 2025, the screens should be erected along with the execution of the planned undertaking. It is suggested for the location of screens for Variants A1, B and C to be determined appropriately by projecting the location from Variants A and D in places exposed to the excessive spread of the acoustic wave.

9. Specification of assumptions for necessary studies of identified monuments in the area of the planned undertaking discovered during the construction works

Considering the potential hazard for archaeological monuments, the Historic Preservation Officer for the Lubelskie Voivodeship in Lublin indicates that it is necessary to perform the following pre-investment archaeological investigations:

1) verification of archaeological surface AZP investigations during the investment to specify the locations of stands with regard to the planned course of the road.
2) pre-investment excavation rescue studies on stands located within the belt occupied by the investment.
3) introduction of archaeological supervision for all earthworks performed within the investment, such as:

- earthworks related with the roadway construction, especially dehumusing on the route of the ring road,
- earthworks in the reconstruction of the necessary technical infrastructure (water, gas, electricity supply and telecommunication networks),
- earthworks related with the construction of auxiliary engineering facilities (flyover, bridge etc.)

4) in the case that cultural stratifications, archaeological objects, building development relics and movable historical objects are found within the area included in the investment project, all works must be stopped in order to carry out rescue archaeological investigations consisting in the documentation of discoveries and complete exploration of the objects.
5) According to Art. 36, section 1, item 5 of the Act on Historic Monument Protection and Custody, the performance of archaeological investigations requires a permit from the Lubuskie Voivodeship Monument Conservation Officer in Lublin.

10. Limited use area

For the planned undertaking a limited use area is not necessary due to:

- As indicated by the calculations, acoustic screens will efficiently eliminate the exceeded values of permissible noise levels
- Negative impact on the contamination of air falls within the borderlines of the planned roadway.

11. Suggested monitoring

In accordance with the Ordinance of the Minister of the Environment of 2 October 2007 on requirements for conducting measurements of the levels of substances or energy in the environment by the road, railway, tramway line, airport or port authority (Journal of Laws No. 192, Item 1392) the Administrator of the road shall perform periodical measurements of substance levels in the environment. The measurements will allow the actual impact related with the operation of the road to be determined and activities to minimise unfavourable impact to undertaken, if necessary. The ordinance specifies the reference

methodologies of performing periodical measurements and general rules of measurement point location.

12. Suggested scope of post-implementation analysis

The noise impact analysis shows that permissible noise levels for more than a dozen buildings may be exceeded. Thus, the method of decreasing the noise level by building acoustic screens was suggested. Due to the fact that these are theoretical calculations based on a mathematical model and a theoretical traffic forecast, it is suggested to perform a post-implementation analysis. The analysis should be carried out after 1 year of the facility commissioning date and submitted within 18 months of the facility commissioning date.

The post-implementation analysis should only evaluate noise level. The analysis should be based on field tests (measurements).

13. Final conclusions

The environmental impact in both variants (A and D) is similar.

The location of the road in both variants is in minor collision with the Pradolina Wieprza Protected Landscape Area and Dolina Wieprza Natura 2000 Area.

The acoustic screens will allow decreasing the noise to the permissible level.

The existing national road no. 17 runs through a number of developed areas, including the town of Ryki (10,000 residents). As shown by noise calculations in the area of the existing national road no. 17, permissible noise levels during the day and at night are already exceeded. Traffic analysis for the adopted timeframes showed that traffic intensity will increase.

A failure to execute the planned undertaking will contribute to a decrease in the road safety and an increase in the number of accidents and collisions. The long-term impact of excessive noise to which the residents of adjacent towns will be exposed is harmful to health.

Therefore, the higher public interest, including social and economic requirements, proves it is necessary to thoroughly execute the planned undertaking. This is required to ensure public safety and protect the health of residents.

The construction of the expressway is expected by the local community to be a way of improving living conditions and ensuring proper environmental policy.

The authors of the paper are in favour of executing the expressway according to Variant D. This variant includes the postulates and expectations of the local community and collides with the Natura 2000 Area to the least extent.

14. Appendices

1. Locations of variants of the planned S17 expressway. Scale 1:20,000.
2. Noise map. Isolines of continuous noise level. Location of measurement points:

- Variant A – without the location of acoustic measures – Scale 1:10,000.
- Variant A – with the location of acoustic measures – Scale 1:10,000.

- Variant D – without the location of acoustic measures – Scale 1:10,000.
- Variant D – with the location of acoustic measures – Scale 1:10,000.

- crossing through the town of Ryki – Scale 1:5,000

3. Spatial development map of Ryki – Dęblin 1:50,000
4. Existing transport system with regard to protected areas, including Natura 2000, contaminated range.