

Non-specialist summary of the Environmental Impact Assessment of the construction of the A1 motorway section between the Lodz/Silesia provincial border (399+742.51 km) and the Pyrzowice interchange (including the interchange itself), (475+327.65 km) and of an S1 expressway section linking the Pyrzowice Interchange with the Lotnisko Interchange (2 + 158 km)

NON-SPECIALIST SUMMARY

ENVIRONMENTAL IMPACT ASSESSMENT OF THE CONSTRUCTION OF THE A1 MOTORWAY SECTION BETWEEN THE LODZ/SILESIA PROVINCIAL BORDER (399+742.51 KM) AND THE PYRZOWICE INTERCHANGE (INCLUDING THE INTERCHANGE ITSELF), (475+327.65 KM) AND OF AN S1 EXPRESSWAY SECTION LINKING PYRZOWICE INTERCHANGE WITH THE LOTNISKO (AIRPORT) INTERCHANGE (2 + 158 KM)

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1. PROJECT DESCRIPTION

1.1 PROJECT SCOPE

The project involves the construction of the A1 Motorway and a section of the S1 Expressway together with the technical infrastructure required for the operation and maintenance of the roads discussed in the EIA and for the provision of services to their users, together with environmental protection systems, emergency communications systems and motorway systems, as well as diversion of the existing engineering services located in the way of the proposed sections of the A1 and the S1. Project scope includes:

1. The construction of road infrastructure:
 - a) A 75.585 km section of the A1 motorway, from the border of Lodz Province to Pyrzowice Interchange (2 carriageways with 2 traffic lanes each, forming the first stage of the final configuration of 2 x 3 traffic lanes)
 - b) A 2.158 km section of the S1 expressway (2 carriageways with 2 traffic lanes each)
 - c) The construction of motorway interchanges:
 - Koscielec, on District Highway 08019/08020
 - Rzasawa on National Highway 1
 - Lgota on the intersection with National Highway 43
 - Blachownia on the intersection with National Highway 46
 - Zawodzie on the intersection with District Highway 904
 - Wozniki
 - Pyrzowice on the intersection with the proposed S1 expressway
 - d) The construction of Lotnisko Interchange on the intersection of the proposed S1 expressway with District Highway 913
 - e) Two-level intersections of the motorway and expressway with roads cutting across the two
 - f) Roads to restore communication between areas bisected by the motorway and expressway, including access roads to fields and forests.
 - g) Engineering structures along the motorway and above it, and facilities associated with the construction of the S1 expressway.
 - h) Culverts under the motorway and the expressway
 - i) Road drainage facilities
 - j) Motorway Service Areas
 - k) Tolling Stations on the interchanges
 - l) Toll Plazas
 - m) Motorway Maintenance Depots
 - n) Emergency crossings across the central reservation
 - o) Emergency motorway entrance ramps
 - p) Facilities to mitigate adverse environmental impact of the motorway, including sound barriers, carriageway rainwater treatment facilities, buffer vegetation, screening vegetation and animal crossings.
 - q) Motorway Service Area and interchange access and exit ramps
 - r) Road safety devices, including horizontal and vertical signage, safety barriers, anti-glare screens, fencing and signage
 - s) An emergency motorway communications system
2. Reconstruction of:
 - a) Existing roads (regional, district and local)
 - b) Associated facilities, including power distribution, telecommunication, drainage, water, gas and oil piping and sewers.
3. Tasks supporting the construction of the A1 motorway and S1 expressway section:

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- a) Demolishing buildings and structures in the way of the proposed project facilities
- b) Clearance of vegetation interfering with the proposed development of the site.

The construction of the A1 motorway section and the S1 expressway section will transform an area of approximately 1200 ha, and require the removal of large areas of vegetation – approximately 200 ha of woodlands and individual tree stands.

The construction of the A1 motorway and the S1 expressway section will involve the demolition of approximately 196 residential houses and farm buildings.

1.2 PROJECT OPTIONS

Options have been proposed for the route of the A1 section under review, both at the Location Proposal and the Location Order stage.

The Location Proposal procedure resulted in a decision specifying the A1 route, published by the Minister of the Interior and Administration on 31 December 1999 (AB-5/WG/112/991).

Various route options were also considered at the Location Order stage. Analysis of the Location Proposal options was prompted by the public protests which followed its publication. The routing options related to the 471+000 – 476+000 km section of the motorway. The study considered two routing options: a route proposed by an NGO, the so-called Ozarowicki Option, and the route suggested in the Location Proposal.

The Environmental Impact Assessment and public consultations resulted in the option proposed by the NGO being recommended for further development. This option also formed the basis of the routing decision published by the Head of Silesian Provincial Administration.

The following Location Orders were obtained for the individual sections of the A1 motorway and the S1 expressway section:

- Location Order No RR-AG.III/JL/5344/1-02 of 30 July 2002 issued by the Head of Silesian Provincial Administration and relating to the section of the A1 toll motorway between the border Lodz/Silesia Provincial border (399+742,51 km) and Rzasawa Interchange (419+650,00 km).
- Location Order No RR-AG.III/JL/5344/1—3/03 of 8 December 2003 issued by the Head of Silesian Provincial Administration and relating to the section of the A1 toll motorway between Rzasawa Interchange (excluding the Interchange itself, 419+650,00 km) and the Wozniki Interchange (including the Interchange, 459+200 km).
- Location Order No RR-AU.II/JH/5344/1-5/05 of 27 September 2005 issued by the Head of Silesian Provincial Administration and relating to the section of the A1 toll motorway between Wozniki Interchange (including the Interchange, 459+200 km) to Piekary Slaskie (490+427 km) together with the section of the S1 expressway linking the Pyrzowice Interchange with the Lotnisko Interchange (0+000 km – 2+158 km).

No options were considered for the section of the S1 expressway under review.

1.3 ANALYSIS OF THE BASE OPTION (“0”) AND THE IMPACT OF A1 MOTORWAY AND S1 EXPRESSWAY CONSTRUCTION ON THE EXISTING ROAD NETWORK

The EIA analyses two options of the construction of the A1 motorway and the S1 expressway, one assuming that the project is implemented and one assuming that no action is taken (the “0 option”). It examines two aspects of the environmental impact of the construction project:

- a) The environmental impact of the construction of the A1 motorway and the S1 expressway relating to changes in traffic volumes on the existing road network and the associated changes in emission levels on the existing road network,

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- b) The environmental impact of abandoning the construction of the A1 motorway and the S1 expressway, on the grounds of increased traffic volumes on the existing road network and the associated change (increase) in emission levels on the existing road network,

The road sections selected for the study were sections of roads serving the area of the proposed motorway and S1 expressway: National Highway 1, National Highway 91, National Highway 913 and Regional Highway 789.

The analyses led to the conclusion that the construction of the motorway will significantly reduce the environmental pressures now generated by the existing roads, by reducing traffic volumes on the road network serving the area adjoining A1 motorway and S1 expressway.

In terms of the soundscape, abandoning the construction of the motorway and operating only the existing road network will by 2025 result in exposing to risk approximately 660 ha of noise-protected area, whereas the construction of the A1 motorway and the S1 expressway would reduce the exposure of those areas by approximately 50% (as compared with the 0 option).

In terms of air quality, abandoning the construction of the motorway and operating only the existing road network will by 2025 result in exposing to risk an area of approximately 660 ha whereas the construction of the A1 motorway and the S1 expressway will reduce the exposure of those areas by approximately 90% (as compared with the 0 option).

In terms of the soil and water environment, the construction of the motorway will significantly reduce pollutant concentration in motorway surface runoff. The extent of the reduction will vary and will depend on the forecast traffic volumes on the existing road network. On average, the suspended sediment load of the rainfall runoff will decrease by 30-50% by comparison with its level before the construction of the motorway.

4. ENVIRONMENT DESCRIPTION

3.1 ENVIRONMENTAL CONSIDERATIONS

The proposed A1 motorway will run North-South through the Province of Silesia.

In terms of administrative divisions, the proposed sections of the motorway and the S1 expressway will pass through the communes of Kamiensk, Redziny, the city of Czestochowa, the communes of Mykanow, Klobuck, Wreczyca Wielka, the Commune and City of Blachownia, and the Communes of Konopiska, Poczesna, Starcza, Wodniki, Ozarowice, Mierzecice and Miasteczko Slaskie.

In terms of its geology, the area is composed of Cretaceous, Lower, Middle and Upper Jurassic and Triassic formations. Recent Holocene deposits are represented by fen soils and alluvial deposits as well as river sands found in the valleys of contemporaneous streams and dune sands.

Most of the motorway will pass through areas with poorly differentiated relief. The greatest differences in elevation occur in the south of the motorway, in the vicinity of Pyrzowice, Woznik and Blachownia. The area's highest point is the Woznicka Gora mountain, rising 354 m above sea level. Triassic escarpments are separated by flats containing the river valleys of Mala Panwia, Liswarta and Upper Warta. The area's lowest point is to be found in the valley of the Warta, at 205 m above sea level.

The proposed motorway section lies within two climatic regions: Lodz and Czestochowa-Kielce. The area's average annual temperatures are 7-8°C. The prevailing winds are S-W and W, with average wind speeds not exceeding 5 m/s.

No active geodynamic processes have been identified in the area.

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The area has a well developed fresh water system, significantly transformed in the past by watercourse regulation and the creation of new surface flows in the form of drainage ditches. The motorway will cut across a number of surface streams and drainage ditches.

The sections of the A1 motorway and the S1 expressway under review lie mainly in the Odra catchment area, with only their southern parts in the Vistula basin. The surface waters originate from secondary basins: those of Mala Panwia, Liswarta and Warta. In addition, the route passes through the headwater areas of the Struga.

The proposed motorway route passes through small natural and artificial water bodies.

Neither the proposed A1 motorway nor the S1 expressway section cut across surface or ground water intakes.

The A1 motorway and the S1 expressway section under review cross four High Yield Aquifers, with some sections passing directly above a Maximum Protection Area and a High Protection Area.

The road sections under review do not cut across mineral deposits.

In terms of its soil types, the area consists mainly of grey-brown podzolic and rust-coloured soils, which are predominantly low grade Class IV and V soils accompanied by podzolic and brown forest soils. Near the rivers the soils are silty, while in the valley of the Warta they are alluvial river soils classified as Grade I grassland soils. In the districts of Tarnowskie Gory and Bedzin, the proposed motorway and expressway routes pass mainly through podzolic and pseudopodzolic and brown forest soils (mainly Grade III-VI). In the vicinity of rivers, the soils are silty and peaty, peaty, half-bog and mineral and alluvial (mainly Grade IV and V). Soils within the Tarnogorski Garb elevation, due to the natural occurrence of ore-bearing Triassic dolomites in the area (associated with zinc and lead ore mining) have high heavy metal content.

The District Environmental Protection Inspectorate has analysed the chemical composition of the soils within the proposed A1 motorway route and around Katowice International Airport in Pyrzowice. Most of the samples were within the allowable heavy metal concentration limits, although some were over the limit, due to the presence of lead, nickel, cadmium, chromium and zinc.

The whole of the A1 route avoids all **existing** protected areas, i.e. national parks, nature reserves, landscape parks, protected landscape areas, Natura 2000 areas, documentation stations, environmental lands and natural and landscape complexes) and because of its distance from them, does not affect them directly.

The motorway cuts across corridors of international, national, regional and local importance.

3.2 ENVIRONMENTAL AUDIT RESULTS

The Province of Silesia section of the proposed motorway will run initially along the existing National Highway 1 (approx. 19 km), and then take a new route to Mykanowo. It will bypass Czestochowa to the west, and continue south as far as the Pyrzowice Interchange.

The first section of the motorway (399+742.5 – 405+200 km) will pass through wooded areas, interspersed by arable land and woodland glades. In this section, woodland predominates (occupying approximately 60-65% of the neighbouring area). In the immediate vicinity of the motorway, within its boundaries, the forests have been cleared. Beyond the motorway boundaries, woodland is dominated by forest communities, with woodland monocultures occupying approx. 5% of the motorway neighbourhood. Plantings contained within its area usually consist of Scots pine, while the grassland within the motorway belt and in its vicinity consists of meadows and covers 5-10% of area, as does arable land. Waste land forms 5% of the future motorway area. Rural developments occupy a small area, representing 3-5% of the motorway surface and its vicinity. They consist mainly of high-density

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rural developments adjoining the proposed motorway. Individual rural buildings are found in the farmland areas.

The next section of the motorway (405+200 – 418+000 km) will also follow the existing National Highway 1. Here, the motorway will pass through areas with virtually no natural vegetation. The whole section is dominated by agricultural landscape consisting mainly of arable land, sometimes lying fallow and waste. Arable land accounts for 75% of the area, wasteland for approx. 10% and tree plantings for approx. 5% of the proposed motorway development area. The tree plantings, which are mainly pine and silver birch, are on land not classified as agricultural. Small tree plantings can also be found in the meadowlands, consisting mainly of black alder, poplar and birch. Meadowland forms approximately 5% of the area intended for motorway development. It is not of major economic importance, nor does it have an important impact on the agricultural landscape. Locally, the meadows follow small water bodies. Rural developments form approximately 5% of the proposed motorway development area.

In the next section of the motorway (418+000 – 433+700 km), the landscape is dominated by agricultural land, forming approx. 50-55% of the land set aside for the motorway development. Their use value is not high. Waste land forms approx. 20% of the area, while tree plantings occupy approx. 10% of the proposed motorway development area. The tree plantings cover areas where cultivation had been abandoned, now covered by self-seeded trees, consisting mainly of Scots pine, silver birch, aspen, mountain ash, blackthorn, pear, whitethorn, buckthorn and juniper. Meadowlands occupy approximately 3% of the area intended for motorway development, taking up a narrow belt around the Kocinka and Gorzelanka river beds. Rural development areas form 5-8% of the area intended for motorway development.

The next section of the motorway (433+700 – 444+850 km) runs from the valley of the Gorzelanka to Laziec. Here, the motorway passes mainly through areas transformed by abandoned iron ore mining operations. The landscape is dominated by various convex relief types produced by barren rock disposal, such as heaps, mounds, ridges and abandoned workings. Here, the dominant features of the landscape are flooded areas (troughs) and drained areas. The area under review is populated by various plant communities, from marsh plants through meadow plants to drier and sparser heathland and grassland vegetation. Waste land forms approx. 50% of the area, representing mainly post-mining land. Arable land forms approx. 30%, and grassland approx. 10-15% of the proposed motorway development area, consisting of hay meadows and pastures of moderate natural and landscape interest, located in the valley of the Stradomka, as well as water meadows of significant natural interest, both in terms of their flora and fauna. Tree plantings form approx. 5% of the proposed motorway development area, with the trees growing by the roadside and occasionally in meadows and consisting largely of black alder, silver birch, poplar and willow.

The area under review contains several areas of great natural interest:

- a) The water bodies in Walaszczyki, at 438+500 – 439+100 km. They are surrounded by meadows, rushes and willow scrub of considerable natural interest and containing many valuable protected plants, including marsh gentian, gladiolus imbricatus, Siberian iris and orchids – helleborine, marsh orchid, spotted orchid and butterfly orchid. The area's biodiversity has made it a hospitable habitat for a variety of vertebrates, above all birds, mammals and amphibians. The Walaszczyki meadow is the only place in the Czestochowa region containing populations of 8 protected plants and 6 rare species of meadow plants on a single site.
- b) Dzbowo meadows, at 439+700 – 440+800 km and 439+800 – 440-800 km. Here, the largest space is occupied by a reed grass community and moor grass meadows containing protected and rare meadow species including marsh gentian, gladiolus imbricatus, Siberian iris and orchids – marsh orchid, spotted orchid and butterfly orchid. It is also home to meadow plants rare for the region – meadow rue, meadowsweet, angelica and elecampane.
- c) Laziec meadows, at 444+450 – 444+650 km – the area around the low spoil heaps contains sparse mat-grass meadows.

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The next section of the motorway (444+850 – 460+600 km) runs mainly through agricultural land, which forms approx. 60% of the proposed motorway development area. Grassland occupies approx. 25% of the area, consisting of small hay meadow and pasture enclaves of moderate natural and landscape interest, located mainly along the local watercourses. Forests cover approx. 10% of the proposed motorway development area, dominated by Scots pine. Other tree varieties include native oak species – common and sessile oak as well as silver birch and black alder. Other deciduous species account for less than 1% of the tree stand, which consists mainly of planted pine stands of similar age, with poorly defined undergrowth and fairly uniform, not very plentiful ground cover. The sparse undergrowth consists of saplings, alder and mountain ash. Tree plantings cover approximately 5% of the area. They consist of roadside trees and occasional meadow specimens, represented mainly by black alder, silver birch, poplar and willow.

The next section of the motorway (460+600 – 464+400 km) abuts the Wozniki-Dyrdy road. In the south, the road runs along a large complex of meadows and rushes formed in the valley of the Lana. To the west and east they adjoin timber forests, mainly pinewoods. Arable land forms approx. 10% of the proposed motorway development area, while grasslands occupy approx. 60%. They consist of intensively farmed hay meadows, in places of considerable natural and landscape interest, containing occasional rare and protected species, such as the Siberian iris, spotted orchid and marsh gentian. Approximately 5% of the area is waste land – abandoned meadows or fields formerly under cultivation, frequently containing self-seeded willow stands. Trees growing along water courses and on the waste land are mainly willow and black alder. Forests are mainly managed pine plantations.

The next section of the motorway (464+400 – 471+000 km) passes mainly through woodlands, occupying approx. 90% of the proposed motorway development area and consisting largely of pine monocultures. The forests are timber forests. They can be locally waterlogged or even flooded. Grasslands occupy approx. 5% of the area, consisting of small woodland hay meadows and pastures of moderate natural and landscape interest, containing no protected species. The forests are interspersed by arable land, wasteland and scattered developments. An important element of the natural environment is the valley of the Mala Panew (465+356 km). The remaining area is wasteland.

The next section of the motorway (471+000 – 475+400 km) will pass through a patchwork of grasslands, ploughlands, wasteland and developed area. It ends in a well-developed area, with the development associated with the presence of the Katowice-Pyrzowice Airport. Arable land forms approx. 10% of the area, while grasslands form approx. 50% of the proposed motorway development area. A larger complex of hay meadows and pastures of moderate natural and landscape interest is associated with the valleys of the Trzcionia (Czlonia) and Brynica. Both rivers are regulated, and their valleys drained. The valleys are covered by regularly mown and seeded hay meadows. Wasteland forms approx. 20% of the proposed motorway development area, consisting mainly of abandoned meadows and ploughlands, now covered with self-seeded trees, with occasional orchards and berry cultivation.

The S1 expressway area is dominated by rural buildings, areas under development and wasteland. Wasteland forms approx. 70% of the proposed S1 expressway development area, consisting mainly of abandoned meadows and ploughlands, now covered with self-seeded trees, mainly lightweight-seeded species. Grasslands form approximately 10% of the proposed S1 expressway development area, consisting mainly of pastures of moderate natural and landscape interest. Forests cover approx. 10% of the proposed S1 expressway development area, consisting mainly of pine monocultures of various ages (5-40 years), taking up small areas among abandoned fields north of Nowa Wies. Tree plantings occur sporadically, sometimes encroaching on the abandoned fields and wasteland and consisting mainly of young specimens (birch, pine and willow).

5. SIGNIFICANT ENVIRONMENTAL IMPACTS

3.1 Risks to land surface

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Land surface will be exposed to risk during operations capable of causing landslides and erosion. The risks will be temporary, persisting until the completion of building works.

Provided that the motorway and expressway routes are correctly designed, no impact on the land surface is expected during their operation.

3.2 Risks to the soundscape

Noise emission must be expected to occur during the building works, generated by the heavy road and demolition plant and by increased traffic on existing roads, due to the need to deliver building materials to site. The EIA specifies locations where building work should be carried out only in daytime.

The EIA designates areas in the neighbourhood of the motorway and the expressway which need to be offered noise-protection, and includes calculations of the motorway and expressway noise propagation range. The soundscape in the neighbourhood of the motorway and the expressway will be protected with suitably selected sound barriers. The EIA includes an assessment of the effectiveness of the proposed barriers. They are listed in Table 40 of the EIA.

3.3 Risks to sanitary air quality

Building works will be associated with periodic emission of pollutants from road plant exhaust and increased traffic on the existing road network, due to the need to deliver the materials required for all motorway building operations to the building sites. No adverse impact of air pollutants is expected to occur outside the roadworks area.

Resident and vegetation protection areas have been designated in the neighbourhood of the motorway and expressway route, and the pollutant propagation range has been calculated.

The EIA includes the following proposals for the protection of areas potentially exposed to pollutant levels higher than the prescribed limit:

- a) Protection of residential areas – to be combined with noise protection by placing green plantings behind the noise barriers.
- b) Farmland protection – Planting on the slopes of escarpments and in excavations. The vegetation will also act as a biological filter and prevent erosion along the edges of the escarpments and excavations.
- c) Protection of the edges of woodlands intersected by the roads by means of infill plantings. A full list of the plantings appears in a separate study.

3.4 Risks to the water circulation system

Changes in the water circulation system associated with the disturbance of the surface runoff will occur because of the need to excavate the road construction area, to build engineering infrastructure facilities, and to insert piles under viaducts, bridges etc. They may also affect the valleys of the various watercourses crossed by the roads. Anthropogenic pressures also result from river bed regulation, affecting virtually all surface water flows.

Due to the fact that most of the existing surface streams have been regulated, the motorway will have only a moderate impact on the water circulation system associated with any further regulation of surface water flows.

During operation, provided building work is correctly carried out, there will be no changes in the water circulation system.

3.5 Risks to surface water quality

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All work on the construction of the A1 motorway and the S1 expressway represents a potential risk to water quality, resulting from silting up due to ground erosion, leaching of pollutants from materials used to build the road surface, and seepage of petroleum products from the road plant, building machinery and vehicles. The EIA sets out the requirements for the prevention of surface water pollution during motorway construction.

In operation, the motorway and expressway will generate effluent consisting of rain and melt water runoff from hard road surfaces as well as from motorway facilities (Motorway Service Areas, Motorway Maintenance Depots, Tolling Stations and Toll Plazas).

The EIA includes a water environment sensitivity analysis and suggests methods of ensuring total protection of the soil and water environment (Table 49).

3.6 Risks to groundwater

Motorway construction may have an adverse impact on groundwater dynamics, due to:

- Changes in groundwater levels, which could fall as a result of drainage or rise in the vicinity of infiltration reservoirs.
- Changes in groundwater alimentation, since sealing the carriageways and shoulders will prevent seepage of rain and melt water into the groundwater.

In the motorway section under review, the impact will not be significant, due to the fact that the ground will only be excavated in a few places. Where drainage becomes necessary, e.g. when installing bridge supports, the water table will fall only during the construction period.

[PO1: This is not what the table says!]

Domestic effluent could also be generated during construction, but this would be a temporary source.

The operation of the A1 motorway section and the S1 expressway section will be associated with risks to groundwater quality. Seepage may result in oil derivatives (lubricants, oils and fuels) as well as chlorides used for snow clearance penetrating into the aquifers. Gaseous combustion products, and in particular nitrogen, sulphur and lead can also seep into groundwater. Pollution from point sources may also result from breakdowns or accidents involving vehicles carrying hazardous substances.

Sources of domestic and process effluent are stopping places, car parks and filling stations. Areas most exposed to contamination from those sources are those without a sealing layer, or only partially sealed.

To protect the soil and water environment (surface and ground water) the EIA recommends total protection systems. A list of the recommended systems appears in Table 49 of the EIA.

3.7 Soils and farming areas

Risks to the soil cover will result from mechanical and chemical impact associated with all stages of project implementation. Mechanical impacts will be associated with earth moving work – excavation and dumping, as well as with the fact that the land will be permanently occupied by the motorway, while surfaces will also be sealed locally changes will occur in the soil and water environment. The motorway and expressway routes will completely and irrevocably destroy existing soil profiles. Areas which are currently partly farmed will be

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taken over by the motorway, thus reducing the size of the farmed area. Soils intended for use in the construction of the A1 motorway and the S1 expressway are locally protected soils.

The EIA includes a sensitivity analysis of the impact of pollutants generated by the operation of the roads under review on the soils and recommends remedial measures. Protective vegetation is recommended for soil protection (Table 50 of the EIA).

3.8 The natural environment

The motorway's impact on the natural environment will be associated with the removal of the existing vegetation and with noise and light emission. The impact will be especially great while the motorway is being laid through woodlands, and in the relevant seasons also through meadows and pastures, and from the clearance of vegetation required for the regulation of surface watercourses. An especially adverse aspect consists in the motorway being routed along and across woodlands, with the resultant loss of marginal communities and exposure of the forest wall, and as a consequence negative impact on the microclimate, light conditions and habitats. The EIA recommends using screening vegetation to protect the woodlands (Table 51 of the EIA).

Another risk posed by the motorway will be the regulation of the watercourses crossed by it, since this is usually associated with the need to clear the area of the surrounding trees and shrubs, leading to a complete change of the environment for the aquatic fauna, and to old river beds being cut off. Since most of the watercourses area already regulated, all that will be needed will be channel reinforcement. Regulation usually affects short sections of watercourses and therefore the loss of habitats by aquatic fauna will be small in comparison with the overall length of the river.

The motorway will cut across the Walaszczyki meadows, which is an area of great natural interest. A flyover has been suggested to eliminate the environmental conflict.

The motorway and expressway will also cut across wildlife migration routes. The EIA contains a list of the migration routes the roads will cross, compiled in consultation with Forest Inspectorates and environmental organisations. The consultations resulted in identifying the wildlife migration points and specifying the parameters of the proposed animal crossings (Table 52 of the EIA).

3.9 Waste management

The construction of the A1 motorway and the S1 expressway will involve the demolition or dismantling of many infrastructural facilities and will generate large quantities of waste. Waste intended for recycling must be stored selectively. The fact that residential and farm buildings will be demolished creates a potential asbestos risk.

Construction site support facilities will also generate various kinds of waste produced by transport vehicles and tools and through the use of staff facilities. Construction waste management will be the Contractor's responsibility. The Contractor must have a documented waste management policy. On completion of building work, it must clear the construction support site and hand it over to the Investor clear of waste which should have been transferred to licensed waste handling organisations.

Motorway facilities (Motorway Service Areas, Motorway Maintenance Depots and Tolling Stations) will generate waste during operation. Waste intended for recycling must be stored selectively.

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Waste will also be generated during motorway operation, and will include rain water runoff settling tank sludge and waste generated by the maintenance of engineering structures (painting and repairing), the noise barriers (barrier cleaning and maintenance) and cultivation of the green plantings. The motorway manager must have a documented waste management policy.

3.10 Cultural heritage

The EIA specifies areas of conflict, which will require advance archaeological studies and subsequent archaeological supervision. (Table 22 of the EIA).

The motorway route will not interfere with the locations of any architectural monuments.

Any buried archaeological items encountered during the work must be treated as required by law.

4. Potential social conflicts

During the A1 planning permission process, the motorway and the expressway routes were submitted for comment to the various provincial, municipal and commune local authorities, and to the Regional Council. Their comments related to the motorway and the expressway routes and their links to other public roads, to their environmental impact and impact on protected cultural monuments. Both central and local government authorities commented favourably on the proposed motorway route. Public hearings formed part of the administrative procedure.

Both a Location Proposal and a Location Order were obtained for the proposed A1 motorway and S1 expressway section. Neither decision was appealed against.

5. Transborder impact

The proposed A1 motorway and S1 expressway section pass at a distance of 80 km from the nearest Polish border. Their greatest impact range is 560 m, and represents noise impact. For this reason, the A1 motorway and S1 expressway section are not expected to have a transborder impact.

6. EXPECTED IMPACT ON NATURA 2000 AREAS

The proposed A1 motorway and S1 expressway sections will not directly cross NATURA 2000 areas. The nearest NATURA 2000 areas are the Tarnowe Gory-Bytom Hypogea, 14 km away from the motorway.

The proposed motorway will cut across environmental corridors linking NATURA 2000 areas with one another. Provided animal crossings and culverts are correctly designed and built, it will have no adverse impact on those areas.

Bearing in mind the distance and the functional relationship which would carry the impact further through the water and air circulation system as well as the gravity system, the project is not expected to have either a direct or an indirect impact on NATURA 2000 areas.

7. PROPOSED MEASURES TO ELIMINATE OR MITIGATE POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACT

7.1 Ground surface and soil cover

Ground surface protection will be provided by:

- Green plantings protecting the soils (Table 50 of the EIA)

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- Installation of erosion control devices on the slopes of excavations and embankments
- Appropriate waste management on the part of the Contractor and the motorway and expressway manager.

7.2 Soundscape

To protect residential areas, sound barriers are proposed for both sides of the motorway, with a total length of over 63 km.

A detailed list of the locations and barrier specifications will be found in Table 40 of the EIA.

Where no noise protection could be provided for technical reasons, the EIA proposes a post-implementation noise study with special attention paid to the unprotected areas.

If it is demonstrated that it is technically impossible to protect those areas, an application will be made for the establishment of a restricted use zone.

7.3 Atmospheric air

The EIA proposes protecting areas at risk of environmental impacts exceeding the allowed limits by combining noise protection (for residential area) with soil and woodland protection measures. The proposed green plantings behind the noise barriers (to protect residential areas) and vegetation screens in the woodlands (EIA Table 51) will protect areas adjoining the motorway and expressway from the penetration of atmospheric air pollutants into the environment.

7.4 The water circulation system

To protect and conserve the water circulation system, the EIA recommends avoiding lining the beds of new watercourses in a watertight way and complying with the provisions of the Water Act.

7.5 Surface and ground waters

The EIA includes a sensitivity analysis of the soil and water environment and suggests methods of ensuring its full protection. Effluent treatment facilities should allow both for normal operation of the proposed roads and for potential accidents.

Sewage effluent from the facilities will be treated by containerised treatment plants.

7.6 The natural environment and landscape

Measures to ensure protection of the natural environment will include:

- a) Mesh fencing of the entire length of the motorway; where specified (where ponds might be filled in), the mesh should be denser, or provision should be made for preventing amphibians from reaching the motorway and expressway.
- b) A flyover should be built over the Walaszczyki water bodies (438+950 – 439+050 km) to protect the nearby habitats.
- c) Free migration of wild life across the motorway and expressway to be ensured by building animal crossings. Their location and specifications are shown in the EIA.
- d) To protect trees in the exposed forest tracts crossed by the motorway, screening vegetation should be planted. Table 52 of the EIA summarises the proposed locations of the woodland screening strips.

7.7 The cultural heritage

Archaeological site studies should be carried out and archaeological supervision established as outlined in Table 22 of the EIA.

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8. Serious accidents

The following steps must be taken to mitigate the risk of serious accidents on the A1 motorway and S1 expressway sections:

- Installing an early warning system for black ice on the A1 motorway and the S1 expressway.
- Determining the location of breakdown areas, stopping places and emergency warning points and providing anti-glare screens on selected parts of the roads.
- Installing and maintaining protective mesh fencing and ensuring that its condition is regularly checked.

The proposed A1 motorway and S1 expressway sections will be provided with road safety systems, including a motorway management system, an emergency telecommunications system, a motorway telecommunications system and a traffic information system, as well as vertical and horizontal signage, safety barriers, anti-glare screens, motorway barriers and fire safety equipment.

9. PROJECT IMPLEMENTATION REQUIREMENTS

9.1 Land use requirements

The Environmental Impact Assessment has demonstrated that the project could be approved subject to compliance with the following requirements:

- a) Reducing to a minimum any changes to the water circulation system and the soil and water environment caused by the building work.
- b) Providing erosion protection and reclaiming land used for construction depots on completion of the building work
- c) Reducing tree clearance to a minimum, with only sparing removal of green plantings during road A1 motorway and the S1 expressway) construction.
- d) Restricting building work to daylight hours (6.00 – 22.00) in residential areas.
- e) Protecting the noise-sensitive parts of areas of known excessive noise levels as specified, in accordance with the proposed guidelines (Table 40 of the EIA).
- f) Providing effluent pre-treatment plants appropriate for the sensitivity of the relevant areas, in accordance with the proposed guidelines (Table 49 of the EIA).
- g) Clearance of woodland areas to take place only during the period 15 August – 1 March (outside the bird breeding season). This provision does not apply to lands deforested in the course of the advance works (399+742.63 – approx. 418+000 km). The ban on building work during the breeding season may be lifted subject to the Building Contractor obtaining an ornithologist's report stating that the relevant woodland area contains no breeding grounds. The report must be based on a site visit and a joint committee decision stating that the work will not interfere with bird breeding grounds.
- h) Ponds (amphibian breeding places) to be filled in only outside their mating season (outside the period 1 April – 15 June). The ban on building work during the amphibian breeding season may be lifted subject to the Building Contractor obtaining a herpetologist's report stating that the pond to be filled in contains no amphibians. The report must be based on a site visit and a joint committee decision stating that there are no amphibians in the ponds to be filled in.
- i) Favoured amphibian migration places (435+000 – 435+200 km, 442+300 – 442+700 km and 460+000 – 460+400 km) being fitted with large-mesh (less than 5 cm) fencing on both sides of the motorway, or with other devices installed on motorway slopes to prevent the amphibians from reaching the carriageway.
- j) Soil protecting vegetation (shrubs and motorway slope plantings) to be planted where shown (Table 50).
- k) Screening vegetation to be planted in areas adjoining woodlands where shown (Table 51).
- l) Animal crossings to be constructed in accordance with the guidelines (Table 52).

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- m) A flyover to be constructed over the Walaszczyki reservoir (438+950 – 439+050 km), in a manner allowing district road located at 439+138,48 km to be reconstructed without interference from the motorway.

9.2 MONITORING

During the project implementation stage, monitoring will consist of archaeological oversight.

No environmental monitoring has been proposed for the operation stage.

9.3 POST-IMPLEMENTATION ANALYSIS

The EIA recommends carrying out a post-implementation noise level analysis at selected points. The analysis should be carried out 12 months after the motorway has been put into operation.