

Expert report on the cross-border effects of the continuation of lignite mining in Turów (Poland) on water in Germany, Dr. habil. Ralf E. Krupp, 2020

The expert report by the German hydrogeologist shows the following negative impacts and risks from the Turów mine on German territory. These impacts and risks will all intensify over the mining period (until 2044) and some of them will persist even into the post-mining period:

- The **significant lowering of groundwater¹** in the open pit environment mainly affects **the deeper tertiary aquifers**, which so far do not serve for drinking water extraction. The lowering funnels in the groundwater **extend to the edge of the tertiary basin to the west, and the lowering amounts to 100 m at the state border with Poland**. By 2044, a further **drop of 20 m is expected**.
- The entire **urban area of Zittau** lies within the lowering funnel, with the **consequence of largely irreversible land subsidence**, which could already be as much as 1 m near the state border, gradually decreasing to zero towards the west. As soil subsidence will increase in the coming years due to the lowering of groundwater, **severe damage to buildings in Zittau cannot be ruled out**. It is estimated that near the state border, land subsidence will **increase to 1.2 m by 2044**. In **Zittau city centre**, land subsidence is estimated to **increase to 36 – 72 cm**.
- As a result of acidic mine drainage, **significantly higher concentrations of sulphate are regularly² detected in the Neisse River³ downstream from the Turów open-cast mine**. This trend **can also be seen for cadmium, uranium and nickel**. These entries also mean that the **chemical status of the Lusatian Neisse is classified as "not good"**, according to the Water Framework Directive. As long as the mine is operating, **the affected German surface waters cannot be expected to achieve a good chemical status, as required by the Water Framework Directive, until 2027**.
- The **near-surface groundwater⁴**, which communicates with the surface waters, is also **presumably affected by the acid mine drainage in the same way as the surface waters** (i.e. pollution by sulphate, nickel, uranium and cadmium), but there are no quality monitoring points in the wide surroundings of the opencast mine to show the exact results.
- As regards the **post-mining period**, the operator estimates the duration of the flooding of the Turów mine to be 35 to 37 years. According to the expert report, **the flooding period will in reality be about 144 years**. Apart from the increased requirement of water needed for drainage, it also implies a prolongation of the acid mine drainage problem.
- Risks that extend to German territory also emanate **from the soil mechanical instabilities of the Turów opencast mine**. **During the flooding phase** of the Turów open pit, **critical conditions are reached, which can cause a reactivation of the latent, still existent sliding surfaces of the embankment quarry** that extends under the Neisse river. At a reactivated slipping embankment fracture, **the Neisse could break through into the open pit, with catastrophic consequences**.

¹ Classified as groundwater body DE-2.

² In the time period from 1993, where the measurements started at the measuring station Kloster Marienthal.

³ Classified as surface water bodies: DESN_674-3, DESN_674-4 and DESN_674-5,

⁴ Classified as groundwater body DE-2.