



The quality characteristics of the water resources in Ptolemais lignite district, Greece

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In Ptolemais lignite district in the northern Greece, five (5) lignite mines operate today. The 75% of the total electrical power of Greece is produced at this area and almost 60×10^6 tn/year is the production of lignite together with the production of Amynteon Mine, located in the northern part of Ptolemais lignite district. In this area five (5) Power Plants operate. The aim of this paper is to investigate the quality of Soulou R., which is the main drainage body of the area, the quality of groundwater around the mines and the quality of Vegoritiss lake, which is the final receiving body of the surface runoff of the area. The hydrochemical analyses of more than 150 water samples were collected for this area. The evaluation of them has shown that:

1. Soulou R. outflows into Vegoritiss Lake at the northern part of the basin. The water pumped out for the protection of the mine (from wells or directly from the mining pits) outflows into Soulou R. The water used in the cooling towers of the Power Plants is also rejected into Soulou R. The water samples of Soulou R. have high concentrations of NO_3^- , NO_2^- , NH_4^+ mainly due to fertilizers of the agriculture activities of the area, the urban wastes and the operation of the Power Plants. The mining activity has influenced the concentration of SO_4^{2-} which is higher than normal but not over the limits.
2. In the area of Amydeo mine the main problem of the water resources quality is the high values of TDS, SS and NH_4^+ mainly due to the geological settings of

the area and the mining activity.

3. The shallow aquifer of the area developed at the quaternary and neogene sediments above the lignite layers, shows deterioration (increased values of NO_3^- concentration) mainly due to fertilizers of the agricultural activity of the area.
4. In Vegoritis lake high concentration of some heavy metals, which comes from the ash of the Power Plants and the mining activity, was detected. Also, a significant problem comes from the geochemical reactions of the limestone and gneiss schist.

Concluded, the main sources of pollution of the water resources in Ptolemais lignite district are: a) the mining activity, the ash from the Power Plants, b) the urban wastes, c) the agricultural activities of the area and d) the geochemical reactions.