

ENVIRONMENTAL MEASURES AT RWE POWER'S OPENCAST LIGNITE MINES - GERMANY

Dr Thomas VON SCHWARZENBERG

RWE Power International, Chief Geologist, Stuetgenweg 2, D-50935, Cologne, Germany,
thomas.schwarzenberg@rwe.com

RWE Power is one of the large energy suppliers in Europe. 40 % of its energy is generated by lignite fired power plants with an installed capacity of around 10 GW in Northwestern Germany. Three large opencast lignite mines are in operation with an annual total capacity of 100 million tons of lignite and 450 million cubic meters of waste. Such production figures may be comparable to future large-scale oil shale mining operations.

The lignite mines are developed in densely populated areas, which affects the environment in respect of groundwater, ash disposal, land reclamation, dust and noise emissions and flora/fauna habitats.

Presently 600 million cubic meters of groundwater are withdrawn per year. This leads to a large drawdown of the water table with negative impacts on extensive protected wetland areas. These impacts are offset by a sophisticated groundwater re-infiltration system percolating fifty million cubic meters of water annually.

In the mines, high pyrite content of up to 0.8 % in some of the waste causes a serious acid mine drainage problem in places that is solved by adding 200,000 tons of fine grained limestone to parts of the waste material. Extensive internal and external monitoring programmes are practised.

In the lignite fired power plants, yearly 6 millions tons of ash have to be transported to landfills with a special clay sealing barrier. A monitoring network observes the possible leaching of harmful substances into the groundwater

During the last hundred years, 200 km² of mining land were reclaimed, creating farmland, forests and lakes. Especially the creation of up to 25 km² large and 300 meter deep future lakes in the mining voids requires extensive planning.

Dust and noise is another major aspect that attracts public attention. Especially the new PM10 regulations are difficult to observe even though comprehensive measures for sprinkling and creating green areas are being taken. One of the major sources of noise are the idlers of the several hundred kilometre-long belt conveyor system in the opencast mines. Special techniques are applied to minimize these emissions.

Flora and fauna are indirectly protected by creating new habitats for birds, reptiles and other species in the reclaimed areas. To this end special wetlands, natural succession areas, hedges and micro-biotopes are created. Special ruderal vegetation areas are planted to provide insect habitats, while stone heaps are piled up for reptiles.