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## Case Study

The pollutants removal and bacterial community dynamics relationship within a full-scale British Gas/Lurgi coal gasification wastewater treatment using a novel system

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1 **The pollutants removal and bacterial community dynamics relationship within a**  
2 **full-scale British Gas/Lurgi coal gasification wastewater treatment using a novel**  
3 **system**

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7 Abstract: The novel system of EBA (based on external circulation anaerobic (EC)  
8 process-biological enhanced (BE) process-anoxic/oxic (A/O) process) was applied to  
9 treat the British Gas/ Lurgi coal gasification wastewater in Erdos, China. After a long  
10 time of commissioning, the EBA system represented a stable and highly efficient  
11 performance, particularly, the concentrations of COD,  $\text{NH}_4^+$ -N, total organic carbon,  
12 total nitrogen and volatile phenols in the final effluent reached 53, 0.3, 18, 106 mg/L  
13 and not detected, respectively. Both the GC-MS and fluorescence excitation-emission  
14 matrix analyses revealed significant variations of organic compositions in the effluent  
15 of different process. The results of high-throughput sequencing represented the EBA  
16 system composed 34 main bacteria which were affiliated to 7 phyla. In addition, the  
17 canonical correspondence analysis indicated high coherence among community  
18 composition, wastewater characteristics and environmental variables, in which the pH,  
19 mixed liquid suspended solids and total phenols loading were the most three  
20 significant variables.

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