

Gasification of biosolids – does it remove PFAS?

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Logan City's largest wastewater treatment plant at Loganholme provides services to 300,000 people producing 34,000 tonnes of biosolids each year. Biosolids treatment and disposal costs are increasing due to rising electricity prices, population growth and tightening of government regulations associated with the management of persistent organic pollutants like perfluoro-alkylsubstances (PFAS) and microplastics in soils. These regulations include Queensland's new *End of Waste Code for Biosolids 2020*.

Logan Water designed and constructed Australia's first biosolids gasification demonstration plant to process sewage sludge by dewatering it in a centrifuge, drying it in a paddle dryer, and treating it at high temperatures in a gasifier. Inside the gasifier, biosolids are heated to 650°C in a low oxygen environment to produce biogas. Recovered energy in the biogas is used to power the drying and heating processes. In total, 12 runs of the demonstration plant over 450 hours of running time were completed between January and August 2020.

Removing (Persistent Organic Pollutants) POPs was a major driver for the demonstration plant as POPs, such as PFAS, now features in Queensland's *End of Waste Code for Biosolids 2020*. Gasification resulted in a 94% reduction in the mass balance of PFAS and a 63% reduction of microplastics in Source 1 of biosolids and 43% reduction in Source 2. It is expected that the destruction of PFAS and microplastics will be greater when biosolids are processed through a belt dryer at the future full-scale gasification facility.