9th IWA Odour & VOC/Air Emission Conference
26-27 October 2021 Bilbao, Spain

ABSTRACT

STUDY FOR ODOR REDUCTION IN A WASTEWATER TREATMENT PLANT BY APPLICATION OF FERRIC CHLORIDE AND/OR SODIUM HYPOCHLORITE IN AREQUIPA, PERU.

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Summary

At the beginning of the operation of a wastewater treatment plant (WWTP) in 2016, the level of odors was an important issue to be solved for safety prevention of workers and for the perception of the community when drivers of vehicles were traveling on the road near the WWTP. The WWTP is in the suburbs of the city at four km. from the nearest neighborhood. According to Peruvian national regulations, a WWTP must be located at least 0.5 km away from the nearest neighborhood. The WWTP is for the municipal wastewater treatment of the city of Arequipa, Peru. It has an average flow capacity of 1.8 m3/s and its effluent is for reuse in a copper mine operation. This WWTP has no infrastructure for sludge digestion. The primary sludge and biological sludge are mixed in a Sludge Holding Tank (SHT) before pumping to the dewatering zone, where the sludge is dewatered to 80% moisture and then loaded onto trucks to be transported 20 km. away for further treatment and final disposal. The objective of this research was to define the best alternative of chemical to use and the optimal dose in order to reduce the perception of odors within the WWTP area and, therefore, the well-being of the workers and enhancing the positive image of the WWTP in the community. The methodology applied in this research was to identify the main sources of gas generation related to bad odors in the components of the WWTP through dynamic olfactometry. A VOC, H2S, and NH3 gas detection equipment with parts per billion (ppb) scale was used, as well as monitoring a meteorological station to establish the environmental effects on the dispersion of these gases. A set of tests were performed to define the chemical to be used and the optimal dosage. The odor levels at the beginning of the study were significantly higher than acceptable. It was determined what component of the plant was the main source of odor emanation, and the application of chemical in this component helped to reduce odor perception.
With the conclusions obtained from the research and its application, the perception of odors has been reduced to very acceptable levels and the WWTP has improved its perception to the community and has improved the work environment. This study would help other operators of WWTPs to evaluate this alternative for odor control.

Keywords: WWTP, sewage sludge, odor.

Motivation:

WWTP La Enlozada in Arequipa, Peru, is a success case of study due to the agreement between a private mining company and government. The company financed construction of the WWTP and pays the operation of the plant to receive the treated effluent for the mining operations. It is very important the good perception of the community of the WWTP management, and control of nasty odours is very important for good relations, even more, if nobody wants a WWTP near to their neighbourhood.

The conclusion is the good result to reduce odour perception. At the beginning of operation odours were very high perception and claims of community were a risk to continue the operation of the plant. With this study, odours have been reduced drastically, and perception of the community to the company are very good.

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- ■ Oral Communication
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- ☐ Policy and associated regulations for odour and air quality.
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- ☐ Source characterization and odour/VOC mapping.
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