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## Impact of activated sludge bulking and foaming on the quality of Kuwait's irrigation water

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Treated municipal wastewater produced in Kuwait is used mainly in agricultural and greenery landscape irrigations. However, there are strong doubts that severe sludge bulking and foaming problems, particularly during winter seasons, may render the treated wastewater to be unsuitable for irrigation purposes. To assess the impact of sludge bulking and foaming problems on the quality of treated effluents, samples were collected weekly for nine months (January to September 2014) from the secondary effluents, tertiary effluents and sludge-mixed liquor streams of the two plants that severely suffer from sludge bulking and foaming problems. Dominant filamentous bacteria were identified and

quantified using a molecular method called VIT (Vermicon Identification Technology). Quality of the treated effluents was determined according to water and wastewater standard methods. Obtained results were then statistically analyzed and compared to irrigation water standards. Statistical results indicated that secondary effluents were greatly impacted by sludge bulking and foaming problems, while tertiary effluents were slightly affected. This finding highlights the importance of having tertiary treatment units in plants that encountering sludge bulking and foaming problems.

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