Utilizing Biodegradation Mechanism to Reuse Produced Water at Cooling Towers, Irrigation and as Wash water

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Abstract

Water is considered a byproduct of oil and gas production and generally is treated by the oil and gas industry as a waste for disposal. Produced water management practices are driven by the cost of the hydrocarbon resource. Produced water is the largest volume waste stream associated with oil and gas production, in this paper, two studies were conducted on two different gas plants utilizing the Microbial Bioreactor Mechanism (MBR) to reuse the produced water as makeup water for facility cooling towers and or in irrigation, water can be utilized in either application after meeting the required specification. Challenges were overcome during this research for two gas plants to eliminate the dissolved hydrocarbons and the harmful constituents to meet the irrigation cooling towers specifications. The first study includes identifying and elimination the root causes of high chemical oxygen demand (COD) by optimizing the operation parameters to avoid carry over of Monoethylene glycol (MEG) and amine derivatives during MEG regeneration process, as the results revealed that association of MEG and methanol with the stripped water from the MEG distillation unit have significant contribution to increase the COD values. The second study elaborates the simple modification to NGL plant oily water system to be transferred to sewage treatment plant to digest the associated hydrocarbons, Methanol and glycol derivatives to be utilized at irrigation. The study covered the injection ration and the amount of Urea nutrient addition to oxidize the oxygenated hydrocarbon and produce effluent water free of harmful components and safe for irrigation.

Key words: [Microbial Bioreactor Mechanism, Mono Ethylene Glycol, Waste Water Treatment Unit, MEG Regeneration]