

ABSTRACT

Anisa Elmayanti. 24020121410002. Under the guidance of Bioremediation of Prof. Drs. Sapto Purnomo Putro, M.Si., Ph.D. dan Prof. Dr. Dra. Erma Prihastanti, M.Si. Oilfield Produced Water Using a Combination of Bacillus flexus and the Microalga Chlorella vulgaris.

Produced water is water produced as a by-product of oil and gas processing and is categorized as waste. Produced water that does not meet quality standards will pollute the environment and endanger human health. Therefore, it is necessary to treat produced water before it is discharged into the environment. Bioremediation is a natural, environmentally friendly, economical, and energy-efficient alternative. Chlorella vulgaris is a promising agent for bioremediation of various polluted aquatic environments. This study aims to determine the effectiveness of petroleum produced water pretreatment using Bacillus flexus in reducing TDS levels, salinity and determine the level of preference of pretreated produced water media for the growth of Chlorella vulgaris microalgae culture. Design This research uses a completely randomized design (CRD) with a factorial pattern of two factors at the stage of pretreatment of produced water, then the results of the best combination at this stage will be continued for the media. The best combination results at this stage will be continued for microalgae culture media. The data obtained were analyzed with Anova test and Duncan Multiple Range Test (DMRT) for pretreatment data. production water. Furthermore, the T-test was carried out for Chlorella vulgaris K1 and K2. The results showed that the effectiveness of oil and gas produced water pretreatment using Bacillus produced by oil and gas using Bacillus flexus in reducing salinity levels by 7,60% and Total Dissolve Solid (TDS) by 6,41%. Chlorella vulgaris cultures can grow on pretreated water media with a concentration of 20% with an Optical Density value of 0,1789 growth rate/day.

Keyword : Produced Water, Chlorella vulgaris, Bioremediation, Bacillus flexus, Bioflocculant.