RINGKASAN

INTERPRETASI PENGARUH TEKANAN TERHADAP AIR YANG DIHASILKAN DITINJAU DARI KOLOM MEMBRAN *SILVERTEC, POST CARBON,* DAN *BIO MINERAL* UNIT PENGOLAHAN AIR MINUM KAPASITAS 100 GPD

(Badia Priscila Tamima; Halaman 50, 8 Tabel, 16 Gambar, 4 Lampiran)

Penelitian ini dilakukan untuk mengevaluasi kinerja system Unit Pengolahan Air Minum berbasis *Reverse Osmosis* (RO) yang ditinjau dari tiga kolom filtrasi, yaitu membrane *silvertec, post carbon,* dan *bio mineral.* Evaluasi dilakukan dengan menganalisis pengaruh variasi tekanan operasi terhadap nilai fluks dan efisiensi rejeksi zat terlarut, meliputi *Total Dissolved Solids* (TDS), Mangan (Mn), dan Besi (Fe). Penelitian ini menggunakan tekanan operasi bertingkat, yaitu 3 bar, 4 bar, 5 bar, 6 bar, dan 7 bar sebagai variable bebas. Hasil penelitian nmenunjukkan bahwa peningkatan tekanan berbanding lurus dengan nilai fluks, dengan nilai tertinggi diperoleh pada membrane *silvertec* sebesar 21.212 L/m^2.jam pada tekanan 1 bar. Namun demikian, efisiensi rejeksi terhadap TDS, Mn, dan Fe cebderung menurun seiring peningkatan tekanan, yang mengindikasikan adanya batas optimal tekanan operasi. Kolom *post carbon* menunjukkan efisiensi rejeksi yang rendah namun berperan dalam peningkatan kualitas air, sedangkan kolom *bio mineral* cenderung meningkatan TDS, sesuai dengan fungsinya sebagai media remineralisasi.Seluruh parameter hasil akhir air olahan menunjukkan kesesuaian dengan baku mutu air minum berdasarkan Permenkes Nomor 2 Tahun 2023. Dengan demikian, system pengolahan air minum ini dinyatakan telah memenuhi kriteria efisiensi secara kualitas maupun kuantitas dalam menghasilkan air siap konsumsi.

Kata kunci : *Reverse Osmosis,* fluks, rejeksi, TDS, tekanan, air minum.

ABTRACT

INTERPRETATION OF THE EFFECT OF PRESSURE ON THE PRODUCED WATER REVIEWED FROM THE SILVERTEC MEMBRANE COLUMN, POST CARBON, AND BIO MINERAL OF A 100 GPD CAPACITY DRINGKING WATER TREATMENT UNIT

(Badia Priscila Tamima; *Pages 50, 8 Tabels, Figures 16, 4 Appendices*)

This study was conducted to evaluate the performance of a Reverse Osmosis (RO) based Drinking Water Treatment Unit system reviewed from three diltration columns, namely silvertec membrane, post carbon, and bio mineral. The evaluation was carried out by analyzing the effect of varations in operating pressure on the flux value and the rejection efficiency of dissolved substances, including Total Dissolved Solids (TDS), Manganese (Mn), and Iron (Fe). This study used a tiered operating pressure, nameky 3 bar, 4 bar, 5 bar, 6 bar, 7 bar ad independent variables. The results of the study showed that the increase in pressure was directly proportional to the flux value, with the highest value obtained on the silvertec membrane 21,212 L/m^2.hour at a pressure of 7 bar. However, the rejection efficiency of TDS, Mn, and Fe tended to fecrease with increasing pressure, which indicates the existence of an optimal limit for operating pressure. The post carbon column shows low rejection efficiency but plays a role in improving water quality, while the bio mineral column tends to increase TDS, in accordane with its function as a remineralization medium. All parameters of the final processed water results show compliance with drinking water quality standards based on Minister of Health Regulation Number 2 of 2023. Thus, this dringking water treatment system is declared to have met the efficiency criteria in terms of quality and quantity in producing water ready for consumption.

Keywords : *Reverse Osmosis, flux, rejection, TDS, pressure, drinking water*