Evaluasi dan Pengembangan Jaringan Distribusi Sistem Penyediaan Air Minum (Objek Studi: Perumahan Cipta Graha Permai) = Evaluation and Development of Drinking Water Distribution Networks (Case Study: Perumahan Cipta Graha Permai)

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Abstrak

Sistem Penyediaan Air Minum (SPAM) di Indonesia khususnya di Kabupaten Bogor dikelola oleh Perumda Air Minum Tirta Kahuripan. Seiring berjalannya waktu penyelenggaraan SPAM memerlukan pengembangan. Oleh karena itu, diperlukannya evaluasi dan pengembangan jaringan distribusi. Dalam penelitian ini bertujuan untuk mengidentifikasi kondisi eksisting jaringan distribusi pada aspek kuantitas, kualitas, dan kontinuitas di Perumahan Cipta Graha Permai; menganalisis parameter hidrolik menggunakan aplikasi EPANET 2.2 dengan skenario pengembangan jumlah penduduk Perumahan Cipta Graha Permai serta pengembangan jaringan distribusi Perumahan Emerald City; memodelkan sisa klor di jaringan distribusi di aplikasi EPANET 2.2. Metode yang digunakan dalam evaluasi dan pengembangan jaringan distribusi berdasarkan proyeksi penduduk model logistik dengan standar kebutuhan air sebesar 100 L/Orang/Hari. Untuk mengevaluasi dan memodelkan kualitas air berdasarkan penelitian di lapangan. Evaluasi kualitas air mengacu pada Peraturan Kementerian Kesehatan RI. Untuk evaluasi dan pengembangan jaringan distribusi mengacu pada Peraturan Kementerian Pekerjaan Umum dan Perumahan Rakyat RI. Berdasarkan evaluasi kondisi eksisting, kuantitas pendistribusian air sebesar 1,79 L/detik. Untuk kualitas air parameter kekeruhan sebesar 0,36 NTU; 0,26 NTU; 0,16 NTU; 0,85 NTU, total koliform dan E. Coli sebesar 0 jumlah per 100 ml sampel. Konsentrasi sisa klor di reservoir sebesar 0,12 mg/L dan di masing-masing Sambungan Langsung (SL) sebesar 0,06 mg/L; 0,03 mg/L; 0,05 mg/L. Secara kontinuitas, pendistribusian air telah didistribusikan selama 24 jam. Hasil analisis parameter hidrolik di EPANET 2.2 tekanan dan kecepatan dalam pipa di Perumahan Cipta Graha Permai sebesar 0,3 m; 0,01 m/detik sedangkan di Perumahan Emerald City sebesar 0,3 m; 0,01 m/detik. Berdasarkan permodelan sisa klor di jaringan distribusi eksisting di sepanjang jaringan sebesar 0,12 mg/L. Dari hasil evaluasi kondisi eksisting pendistribusian air sudah memenuhi baku mutu secara kuantitas dan kontinuitas. Namun, pada aspek kualitas sisa klor di SL belum memenuhi baku mutu. Dari analisis parameter hidrolik belum memenuhi kriteria desain pipa distribusi. Berdasarkan permodelan sisa klor tidak adanya penurunan konsentrasi di sepanjang jaringan pipa.

.....The drinking water supply system (SPAM) in Indonesia, especially in Bogor district, is managed by the Tirta Kahuripan Drinking Water Company. As time goes by, SPAM maintenance needs development. Therefore, it is necessary to evaluate and develop the distribution network. The study aims to identify the existing conditions of the distribution network in terms of quantity, quality, and continuity in the Cipta Graha Permai Housing; analyze the hydraulic parameters using the EPANET 2.2 application with the development scenario of the number of people in Cipta Graha Permai Housing as well as the development of the Emerald City Housing Distribution Network; model the residues of chlorine in the distribution network in EPANET 2.2. The method used in evaluating and developing the distribution network is based on the population projections of the logistic model with the standard water needs of 100 L / Person / Day. To

evaluate and model water quality based on field research. Water quality assessment refers to the Rules of the Ministry of Health RI. For evaluating and developing the distribution network, refer to the Ministry of Public Works and People's Housing RI Regulations. Based on the assessment of existing conditions, the amount of water distribution was 1.79 l/second. For water quality, the hardness parameters are 0.36 NTU; 0.26 NTU; 0.16 NTU; and 0.85 NTU. Coli is 0 quantity per 100 ml sample. The residual chlorine concentration in the reservoir was 0.12 mg/L, and each Direct Connection (SL) was 0.06 mg / L; 0.03 mg / l; 0.05 mg/l. Continuously the water distribution has been distributed over 24 hours. The result of the analysis of hydraulic parameters in EPANET 2.2 pressure and speed in the pipe in Cipta Graha Permai Housing was 0.3 m; 0.01 m / second, while in Emerald City Housing, 0.3m; 0.01 m / second. Based on the modelling of chlorine residues in network distribution existing along the network of 0.12 mg/L. From assessing existing conditions, the water distribution has fulfilled the quality standards in quantity and continuity. However, in terms of quality, residual chlorine in SL has not fulfilled the quality standards. The analysis of the hydraulic parameters did not fulfil the design criteria of the distribution pipe. Based on the residual chlorine model, there was no decrease in concentration along the pipeline.