

# EVALUASI INSTALASI PENGOLAHAN AIR TERPRODUKSI DI *GATHERING STATION-X, PT.X*

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## INTISARI

Pengolahan air limbah merupakan komponen krusial dalam upaya pengelolaan dan pemantauan lingkungan yang berkelanjutan. Di sektor industri hulu migas, khususnya dalam kegiatan produksi, dihasilkan limbah berupa air terproduksi yang memerlukan pengolahan khusus. Evaluasi sistem pengolahan air limbah terproduksi menjadi penting untuk memastikan efisiensi yang baik. Tujuan dari penelitian ini yaitu untuk mengevaluasi *removal efficiency* Instalasi Pengolahan Air Terproduksi di *Gathering Station-X, PT.X*, menganalisis kesesuaian dimensi terhadap kriteria desain dan menganalisis dampak akibat produksi pada kanal dan memberikan arahan pengolahan sesuai dengan permasalahan pada daerah penelitian.

Penelitian dilakukan menggunakan metode kuantitatif dengan dua sumber data berupa data primer dan data sekunder. Secara garis besar, penelitian terbagi dalam tahapan pengumpulan data dan analisis data. Pengumpulan data dilakukan dengan survei, pengamatan lapangan dan uji laboratorium pada sampel air. Sampel air diambil menggunakan metode *purposive sampling*. Data yang diperoleh kemudian dianalisis secara matematis dan deskriptif. Analisis matematis dilakukan pada penilaian *removal efficiency*, evaluasi kesesuaian dimensi terhadap kriteria desain pada Pertek Pemenuhan Baku Mutu Air Limbah PT. X No. S.111/PPKL/PPA/PKL-2/3/2022 dan penilaian dampak pada kanal berdasarkan status mutu air sesuai dengan PP No. 22 Tahun 2021.

Hasil evaluasi terhadap kemampuan *removal efficiency* pada COD menunjukkan nilai sebesar 27,63% dan nilai sebesar 64,05% pada TDS dengan kualitas *effluent* yang dihasilkan sudah berada di bawah baku mutu lingkungan. Berdasarkan evaluasi kesesuaian dimensi, seluruh unit diketahui belum memenuhi kriteria desain sehingga memerlukan penyesuaian lebih lanjut. Dampak kegiatan produksi yang dikaji pada badan air kanal menunjukkan status cemar ringan pada titik 10 m dan 200 m setelah *Outlet*. Mempertimbangkan rencana peningkatan produksi minyak bumi di PT.X, disarankan dua arahan pengolahan dengan pendekatan teknologi dan institusi. Pendekatan teknologi yaitu penambahan 2 *pre-wetland* dengan dimensi 58 x 5 m dan 48 x 5 m serta 1 kompartemen *wetland* dengan dimensi 40 x 9 m, penambahan tanggul pada *constructed wetland* baru serta penanaman ulang *Constructed Wetland 3* dengan tanaman *Phragmatis Australis*. Sedangkan, pendekatan institusi yaitu koordinasi dan kerja sama antar perusahaan dan pemerintah guna memastikan keberlanjutan pengelolaan Instalasi Pengolahan Air Terproduksi di GS-X, PT. X.

**Kata Kunci:** Evaluasi, Instalasi Pengolahan Air Terproduksi, *Removal Efficiency*, Dimensi, Dampak

**EVALUATION OF PRODUCED WATER TREATMENT PLANT  
AT GATHERING STATION-X, PT. X**

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**ABSTRACT**

*Wastewater treatment is a crucial component in sustainable environmental management and monitoring efforts. In the upstream oil and gas industry sector, especially in production activities, waste is generated in the form of produced water which requires special treatment. Evaluation of the produced wastewater treatment system is important to ensure effectiveness and optimal performance. The purpose of this study is to assess the efficiency of wastewater treatment plants in the form of produced water at Gathering Station-X, PT.X, analyze the environmental impact due to WWTP activities and provide appropriate treatment directions according to the problems in the study area.*

*The research was conducted using quantitative methods with two data sources in the form of primary data and secondary data. Broadly speaking, the research is divided into the stages of data collection and data analysis. Data collection was carried out by surveys, field observations and laboratory tests on water samples. Water samples were taken using purposive sampling method. The data obtained were then analyzed mathematically and descriptively. Mathematical analysis was carried out on the removal efficiency assessment, evaluation of dimensional conformity to the design criteria in Pertek Pemenuhan Baku Mutu Air Limbah PT X No. S.111/PPKL/PPA/PKL-2/3/2022 and impact assessment on canals based on water quality status in accordance with PP No. 22 of 2021.*

*The results of the evaluation of the removal efficiency capability on COD showed a value of 27.63% and a value of 64.05% on TDS with the quality of the effluent produced already below the environmental quality standards. Based on the evaluation of dimensional suitability, all units are known not to meet the design criteria so that further adjustments are needed. The impact of the assessed production activities on the canal water body shows a mild pollution status at points 10 m and 200 m after the Outlet. Based on the plan to increase fluid production, two treatment directions are suggested, namely through technological and institutional approaches. The technological approach is the addition of Constructed wetland units with identical designs and the institutional approach is coordination and cooperation between companies and governments to ensure the sustainability of the management of the Produced Water Treatment Plant at GS-X, PT. X..*

**Keywords : Evaluation, Produced Water Treatment Plant, Removal Efficiency, Dimension, Impact**