

## **ABSTRAK**

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**Nama Pembimbing** : **Dr. Ir. Ratnawati, M.Sc, Eng., I.P.M**

**Program Studi** : **Teknik Kimia**

**Judul** : **PRA-RANCANGAN PABRIK PENGOLAHAN AIR LIMBAH DENGAN KAPASITAS 30000 M<sup>3</sup>/TAHUN /TAHUN**

Penyusunan pra-rancangan didasarkan pada kegiatan MBKM di PT Anugrah Analisis Sempurna, adalah perusahaan dengan status Penanaman Modal Dalam Negeri (PMDN) yang bergerak dibidang jasa pengujian laboratorium dengan produk adalah hasil analisis laboratorium. Lokasi kegiatan terletak di Jalan Raya Jakarta-Bogor KM 37 Kelurahan Sukamaju Kecamatan Cilodong Kota Depok.

Pengoperasian PT Anugrah Analisis Sempurna menghasilkan air limbah yang berasal dari sisa sampel air yang diuji, air bekas cucian peralatan laboratorium, air limbah domestic dan air buangan dari fasilitas pengendalian pencemaran udara (scrubber lemari asam). Selama ini PT Anugrah Analisis Sempurna selaku penanggung jawab usaha telah mengolah air limbah yang dihasilkan dalam IPAL dan hasil olahan dialirkan ke drainase kota. Berdasarkan dokumen UKL-UPL tahun 2013, hasil olahan akan diresapkan ke permukaan tanah, sedangkan berdasarkan Izin Pembuangan Ilmbah Cair (IPLC) yang dimiliki tahun 2017, hasil olahan air limbah diwajibkan dibuang ke Kalibaru. Oleh karena sungai cukup jauh dari lokasi kegiatan, maka PT Anugrah Analisis Sempurna berencana memanfaatkan air limbah untuk menyiram tanaman.

Dengan mempertimbangkan banyaknya kawasan industri yang terdapat didekat lokasi pendirian IPAL. Kawasan industri yang berlokasi di daerah Bekasi dan Tangerang dengan rata-rata jumlah perusahaan sebanyak 500-2000 disetiap kawasan industri. Berdasarkan data sumber bahan baku air limbah didaerah JABODETABEK, didapati bahwa produksi limbah cair pertahun mencapai 27.500 m<sup>3</sup> dari daerah industry di Tangerang dan Bekasi saja. Sehingga pendirian pabrik pengolahan air limbah menjadi sebuah industri yang baik dan bermanfaat membuka peluang kerja.

Pabrik pengolahan air limbah berkapasitas 30.000 m<sup>3</sup> pertahun ini direncanakan akan didirikan di Kota Depok, Jawa Barat dan akan didirikan pada tahun 2022, akan berproduksi pada tahun 2023, proses pengolahan air limbah meliputi proses aerasi, sedimentasi, klorinasi dan filtrasi. Demi tercapainya outlet air limbah yang dapat sesuai dengan baku mutu pemerintah yang dipersyaratkan.

Pabrik pengolahan air limbah memiliki total modal investasi (TCI) sebesar Rp18.245.279.108 dengan struktur permodalan 48,70% modal sendiri atau Rp8.884.598.305 dan 51,30% atau Rp9.360.680.803 untuk pinjaman dari bank. Berdasarkan hasil analisis ekonomi, diantaranya pembangunan konstruksi IPAL selama 2 tahun yaitu tahun 2022 – 2024. Dihasilkan Net Cash Flow at Present Value (NCFPV) bertanda positif sebesar 185.615.602.423, Internal Rate of Return (IRR) sebesar 56,15%, Minimum Payback Period (MPP) selama 1 tahun 6 bulan, dan Break event point (BEP) ditahun pertama adalah 75,88% sehingga pabrik ini layak didirikan.

## **ABSTRACT**

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**Advisor Name** : **Dr. Ir. Ratnawati, M.Sc, Eng., I.P.M**  
**Study Program** : **Chemical Engineering**  
**Title** : **PRE-DESIGN OF WASTEWATER TREATMENT PLANT  
WITH CAPACITY OF 30000 M3/YEAR/YEAR**

The preparation of the pre-design is based on MBKM activities at PT Anugrah Analysis Perfect, is a company with Domestic Investment (PMDN) status engaged in laboratory testing services where products are the results of laboratory analysis. The activity location is located on Jalan Raya Jakarta-Bogor KM 37, Sukamaju Village, Cilodong District, Depok City.

The operation of PT Anugrah Analysis Perfect produces wastewater originating from the remaining water samples tested, water used for washing laboratory equipment, domestic waste water and waste water from air pollution control facilities (fume hood scrubbers). So far, PT Anugrah Analysis Perfect as the person in charge of the business has treated the wastewater produced in the WWTP and the processed products have been channeled into the city drainage. Based on the 2013 UKL-UPL document, processed products will be impregnated onto the soil surface, while based on the Liquid Waste Disposal Permit (IPLC) held in 2017, processed wastewater is required to be disposed of in Kalibaru. Because the river is quite far from the activity location, PT Anugrah Analysis Perfect plans to use the waste water to water plants.

Taking into account the number of industrial areas located near the location of the WWTP establishment. Industrial estates located in the Bekasi and Tangerang areas with an average number of companies of 500-2000 in each industrial area. Based on data on sources of raw material for wastewater in the JABODETABEK area, it is found that the annual production of liquid waste reaches 27,500 m<sup>3</sup> from industrial areas in Tangerang and Bekasi alone. So that the establishment of a wastewater treatment plant becomes a good and useful industry that opens up job opportunities.

A wastewater treatment plant with a capacity of 30,000 m<sup>3</sup> per year is planned to be built in Depok City, West Java and will be built in 2022, will start production in 2023, the wastewater treatment process includes aeration, sedimentation, chlorination and filtration processes. For the sake of achieving wastewater outlets that can comply with the required government quality standards.

The wastewater treatment plant has a total investment capital (TCI) of IDR 18,245,279,108 with a capital structure of 48.70% own capital or IDR 8,884,598,305 and 51.30% or IDR 9,360,680,803 for loans from banks. Based on the results of economic analysis, including the construction of WWTP construction for 2 years, namely 2022 – 2024. Resulted in a positive Net Cash Flow at Present Value (NCFPV) of 185,615,602,423, Internal Rate of Return (IRR) of 56.15%, Minimum Payback Period (MPP) for 1 year 6 months, and Break event point (BEP) in the first year is 75.88% so that this factory is feasible to build.