Evaluasi timbulan lumpur dan perancangan instalasi pengolahan lumpur : studi kasus: instalasi Pengolahan Air Minum (IPAM) Cibinong, PDAM Tirta Kahuripan = Evaluation of sludge generation and design of sludge treatment plant : case study : Cibinong Water Treatment Plant (WTP), PDAM Tirta Kahuripan

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Abstrak

Instalasi pengolahan air minum dalam prosesnya akan menghasilkan limbah yang berupa lumpur. Berdasarkan Peraturan Pemerintah no. 16 tahun 2005 tentang Pengembangan Sistem Penyediaan Air Minum pasal 9 ayat 3 bahwa limbah akhir dari proses pengolahan air baku menjadi air minum wajib diolah terlebih dahulu sebelum dibuang ke sumber air baku dan daerah terbuka. Instalasi Pengolahan Air Minum Cibinong merupakan salah satu instalasi yang belum melakukan pengolahan limbah dari proses pengolahan air karena limbah yang dihasilkan langsung dibuang ke sungai Ciliwung. Jumlah timbulan debit lumpur dengan aliran kontinyu IPAM Cibinong I sebesar 394,35 m3/hari dan IPAM Cibinong II sebesar 187,44 m3/hari.
Tujuan dari penelitian ini untuk merencanakan instalasi pengolahan lumpur guna mentaati peraturan yang berlaku. Berdasarkan neraca massa dapat diketahui unit penghasil lumpur yang signifikan adalah unit sedimentasi, dikarenakan massa lumpur yang dihasilkan cukup besar. Akan direncanakan unit pengolahan lumpur yang terdiri dari proses thickening, chemical conditioning, dan dewatering. Pemilihan unit tahap dewatering pengolahan tersebut berdasarkan analisa SWOT dan metode decision matrix, kemudian diperoleh mechanical dewatering dengan menggunakan centrifuge.
Berdasarkan luas lahan, timbulan cake lumpur, dan kebutuhan polimer dipilih instalasi pengolahan lumpur yang terdiri dari 2 buah bak ekualisasi. Dimana 1 bak ekualisasi mengumpulkan lumpur dari unit flokulasi dan air pencucian filter, selanjutnya menuju chemical conditioner, recovery basin¸ dan gravity thickener. Sedangkan bak ekualisasi lainnya mengumpulkan lumpur dari unit sedimentasi menuju gravity thickener kemudian menuju centrifuge.
<hr><i>Water treatment plant produced sludge in a large quantity. Based on Government Regulation No. 16, 2005 in which under item 3 of the article 9, it is stipulated that the waste produced from any processing must be treated before it is discharged into water sources and open areas. The sludge generated from WTP Cibinong I and II is directly discharge into stream Ciliwung. The sludge generation of WTP Cibinong I in continuous flow is 394,35 m3/day and WTP Cibinong II is 187,44 m3/day.
The aim of this study is to plan for sludge treatment plant in order to comply with applicable regulations. Based on the mass balance, sedimentation is a unit which significantly produced sludge in large quantity. Sludge treatment plant will be planned consists of thickening process, chemical conditioning, and dewatering. The selection of dewatering processing unit is based on SWOT analysis and decision matrix method, with this tools it can be concluded that centrifuge will be used.
Based on land area, sludge generation, and need of polymer, will be selected sludge treatment plant which has 2 equalization basins. One equalization basin will collect the sludge from flocculation unit and backwash water and towards to chemical conditioner, recovery basin, and will be mixed in gravity thickener with outflow from other equalization basin which collects sludge from sedimentation. After that, it will

toward to mechanical dewatering centrifuge.</i>