

## DAFTAR PUSTAKA

- Ajit, K. (2016). A Review on Grey Water Treatment and Reuse. *International Research Journal of Engineering and Technology*, 2395–56. <https://www.irjet.net/archives>
- Ardhito, M. M. (2019). *Perancangan Dan Evaluasi Start-Up Instalasi Pengolahan Air Limbah (IPAL) Kamar Mandi Umum Wisdom Park UGM Dengan On-Off Aeration Tank Untuk Menurunkan Kadar Nitrogen*.
- Ávila, C., Pelissari, C., Sezerino, P. H., Sgroi, M., Roccaro, P., & García, J. (2017). Enhancement of total nitrogen removal through effluent recirculation and fate of PPCPs in a hybrid constructed wetland system treating urban wastewater. *Science of the Total Environment*, 584–585, 414–425. <https://doi.org/10.1016/j.scitotenv.2017.01.024>
- Ayu, C., Anggraeni, D., Kurniasari, S., & Ismail, T. (2002). Penggunaan Membran Bioreaktor (MBR) Pada Activated Sludge Dalam Pengolahan Limbah Cair Industri. *2309105004*.
- Bastom, B. M. (2015). Kajian Efek Aerasi Pada Kinerja Biofilter Aerob Dengan Media Bioball Untuk Pengolahan Air Limbah Budidaya Tambak Udang. *Tugas Akhir*.
- Bella, G. Di, & Mannina, G. (2020). Intermittent aeration in a hybrid moving bed biofilm reactor for carbon and nutrient biological removal. *Water (Switzerland)*, 12(2). <https://doi.org/10.3390/w12020492>
- Bodík, I., & Kubaská, M. (2013). Energy and sustainability of operation of a wastewater treatment plant. *Environment Protection Engineering*, 39(2), 15–24. <https://doi.org/10.5277/EPE130202>
- Bunce, J. T., Ndam, E., Ofiteru, I. D., Moore, A., & Graham, D. W. (2018). A review of phosphorus removal technologies and their applicability to small-scale domestic wastewater treatment systems. *Frontiers in Environmental Science*, 6(FEB), 1–15. <https://doi.org/10.3389/fenvs.2018.00008>
- Cassidy, J., Silva, T., Semião, N., Ramalho, P., Santos, A., & Feliciano, J. (2020). Improving wastewater treatment plants operational efficiency and effectiveness through an integrated performance assessment system. *H2Open Journal*, 3(1), 276–287. <https://doi.org/10.2166/h2oj.2020.007>

- Chen, H., Tu, Z., Wu, S., Yu, G., Du, C., Wang, H., Yang, E., Zhou, L., Deng, B., Wang, D., & Li, H. (2021). Recent advances in partial denitrification-anaerobic ammonium oxidation process for mainstream municipal wastewater treatment. *Chemosphere*, 278, 130436. <https://doi.org/10.1016/j.chemosphere.2021.130436>
- Côté, P., Peeters, J., Adams, N., Hong, Y., Long, Z., & Ireland, J. (2015). A new membrane-aerated biofilm reactor for low energy wastewater treatment: Pilot results. *88th Annual Water Environment Federation Technical Exhibition and Conference, WEFTEC 2015*, 6(January), 4226–4239. <https://doi.org/10.2175/193864715819540883>
- Daalkhajav, U., & Nemati, M. (2014). Ammonia loading rate: An effective variable to control partial nitrification and generate the anaerobic ammonium oxidation influent. *Environmental Technology (United Kingdom)*, 35(5), 523–531. <https://doi.org/10.1080/09593330.2013.796006>
- Damalerio, R., Orbecido, A., Promentilla, M. A., Eusebio, R. C., Patacsil, L., & Beltran, A. (2021). Preliminary Investigation of an Installed Pilot-Scale Biological Nutrient Removal Technology (BNRT) for Sewage Treatment. *MATEC Web of Conferences*, 333, 12002. <https://doi.org/10.1051/mateconf/202133312002>
- Derco, J., Urminská, B., Kovács, A., & Šimkovič, K. (2017). Biological nutrient removal in an intermittently aerated bioreactor. *Chemical and Biochemical Engineering Quarterly*, 31(2), 179–185. <https://doi.org/10.15255/CABEQ.2016.1026>
- Dirjen PUPR. (2013). *Buku A Panduan Perencanaan Teknik Terinci Bangunan Pengolahan Lumpur Tinja*. 1–237.
- DPPLP. (2018). Detailed Engineering Planning Guidelines for Off-Site Domestic Wastewater Treatment System (Series B). *Director General of Cipta Karya Ministry of Public Works and Public Housing*, B. [http://ciptakarya.pu.go.id/plp/index.php/v2/kategori\\_pedoman/9/10](http://ciptakarya.pu.go.id/plp/index.php/v2/kategori_pedoman/9/10)
- Effendi, H. (2003). *Telaah Kualitas Air bagi Pengelolaan Sumberdaya dan Lingkungan Perairan*.
- Fang, Q., Xu, W., Xia, G., & Pan, Z. (2018). Effect of C/N ratio on the removal of

- nitrogen and microbial characteristics in the water saturated denitrifying section of a two-stage constructed rapid infiltration system. *International Journal of Environmental Research and Public Health*, 15(7), 1–13. <https://doi.org/10.3390/ijerph15071469>
- Febriyana, R. F. (2014). Prototype Unit Pengolahan Limbah (Activated Sludge Biosand Filter Reactor) Untuk Menurunkan Kadar Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD) Dan Total Suspended Solid (TSS) Pada Limbah Cair Tahu. In *Implementation Science* (Vol. 39, Issue 1). <https://doi.org/10.4324/9781315853178>
- Firra, R., Iwan, W., & Tuhu Agung, R. (2016). Peningkatan Efektifitas Aerasi dengan Menggunakan Micro Bubble Generator (MBG). *Envirotek: Jurnal Ilmiah Teknik Lingkungan*, 8(2), 88–97.
- Fitrahani, L. Z., Indrasti, N. S., & Suprihatin. (2012). Karakterisasi Kondisi Operasi dan Optimasi Proses Pengolahan Air Limbah Industri Pangan. *E-Jurnal Agroindustri Indonesia*, 1(2), 110–117. <http://journal.ipb.ac.id/index.php/e-jaii/index>
- Garcia-Ochoa, F., Gomez, E., Santos, V. E., & Merchuk, J. C. (2010). Oxygen uptake rate in microbial processes: An overview. *Biochemical Engineering Journal*, 49(3), 289–307. <https://doi.org/10.1016/j.bej.2010.01.011>
- Gou, J., Hong, C. U., Deng, M., Chen, J., Hou, J., Li, D., & He, X. (2019). Effect of carbon to nitrogen ratio on water quality and community structure evolution in suspended growth bioreactors through biofloc technology. *Water (Switzerland)*, 11(8). <https://doi.org/10.3390/w11081640>
- Grady, L., Daigger, G., & Lim, H. (1999). *Biological Wastewater Treatment, 2nd editon*. Marcel Dekker. Inc.
- Gürtekin, E. (2019). Effect of Intermittent Aeration and Step-Feed on Nitrogen Removal Performance in Anoxic-aerobic Sequencing Batch Reactor. *Natural and Engineering Sciences*, 8(5), 55.
- Handayani, R. (2012). *Evaluasi Kinerja dan Optimasi Instalasi Pengolahan Limbah Cair (IPLC) Gedung Perkantoran PT. Pacific Paint dalam Penurunan Amonia*.
- Henkel, J. (2010). *Oxygen Transfer Phenomena in Activated Sludge*. 179.

<http://tuprints.ulb.tu-darmstadt.de/3008/1/Henkel-2010->

[Oxygen\\_Transfer\\_Phenomena\\_in\\_Activated\\_Sludge.pdf](#)

Indriaswari, H. (2019). Perancangan Dan Evaluasi Start-Up Instalasi Pengolahan Air Limbah (IPAL) Toilet/Kamar Mandi Umum Wisdom Park UGM Dilengkapi Dengan Microbubble Generator Nozzle Dan Aerasi Intermittent Untuk Menurunkan Kadar COD Dan TSS.

Karches, T. (2018). Effect of internal recirculation on reactor models in wastewater treatment. *WIT Transactions on Ecology and the Environment*, 228(May), 145–153. <https://doi.org/10.2495/WP180151>

Kolb, M., Bahadir, M., & Teichgräber, B. (2017). Determination of chemical oxygen demand (COD) using an alternative wet chemical method free of mercury and dichromate. *Water Research*, 122, 645–654. <https://doi.org/10.1016/j.watres.2017.06.034>

Lang, Z., Zhou, M., Zhang, Q., Yin, X., & Li, Y. (2020). Comprehensive treatment of marine aquaculture wastewater by a cost-effective flow-through electro-oxidation process. *Science of the Total Environment*, 722, 137812. <https://doi.org/10.1016/j.scitotenv.2020.137812>

Lestari, D. S. (2020). Evaluasi Kinerja Instalasi Pengolahan Air Limbah Domestik (Studi Kasus: Ipal Domestik Waduk “X”, Jakarta). *Jurnal Sumber Daya Air*, 16(2), 91–102. <https://doi.org/10.32679/jsda.v16i2.653>

Li, Z., Zou, Z., & Wang, L. (2019). Analysis and Forecasting of the Energy Consumption in Wastewater Treatment Plant. *Mathematical Problems in Engineering*, 2019. <https://doi.org/10.1155/2019/8690898>

Liu, C., Tanaka, H., Ma, J., Zhang, L., Zhang, J., Huang, X., & Matsuzawa, Y. (2012). Effect of microbubble and its generation process on mixed liquor properties of activated sludge using Shirasu porous glass (SPG) membrane system. *Water Research*, 46(18), 6051–6058. <https://doi.org/10.1016/j.watres.2012.08.032>

Loganathan, P., Vigneswaran, S., Kandasamy, J., & Bolan, N. S. (2014). Removal and recovery of phosphate from water using sorption. *Critical Reviews in Environmental Science and Technology*, 44(8), 847–907. <https://doi.org/10.1080/10643389.2012.741311>

- Machefert, S. E., Dise, N. B., Goulding, K. W. T., & Whitehead, P. G. (2002). Nitrous oxide emission from a range of land uses across Europe. *Hydrology and Earth System Sciences*, 6(3), 325–337. <https://doi.org/10.5194/hess-6-325-2002>
- Magnaye, F. A., Gaspillo, P. D., & Auresenia, J. L. (2009). Biological Nitrogen and COD Removal of Nutrient-Rich Wastewater Using Aerobic and Anaerobic Reactors. *Journal of Water Resource and Protection*, 01(05), 376–380. <https://doi.org/10.4236/jwarp.2009.15045>
- Metcalf, & Eddy. (2003). Metcalf & Eddy, Inc. Wastewater Engineering Treatment and Reuse. In *Journal of Wastewater Engineering* (p. 4th edition).
- Mirbagheri, S. A., Ebrahimi, M., & Mohammadi, M. (2014). Optimization method for the treatment of Tehran petroleum refinery wastewater using activated sludge contact stabilization process. *Desalination and Water Treatment*, 52(1–3), 156–163. <https://doi.org/10.1080/19443994.2013.794105>
- Montgomery, D. C. A. S. U. (2017). *Design and Analysis of Experiments Ninth Edition*.  
[www.wiley.com/go/permissions.%0Ahttps://lccn.loc.gov/2017002355](http://www.wiley.com/go/permissions.%0Ahttps://lccn.loc.gov/2017002355)
- Najafpour, G. D., Zinatizadeh, A. A. L., & Lee, L. K. (2006). Performance of a three-stage aerobic RBC reactor in food canning wastewater treatment. *Biochemical Engineering Journal*, 30(3), 297–302. <https://doi.org/10.1016/j.bej.2006.05.013>
- Nikmanesh, M. S., Eslami, H., Momtaz, S. M., Biabani, R., Mohammadi, A., Shiravand, B., & Mahmoudabadi, T. Z. (2018). 28.pdfPerformance Evaluation of the Extended Aeration Activated Sludge System in the Removal of Physicochemical and Microbial Parameters of Municipal Wastewater: A Case Study of Nowshahr Wastewater Treatment Plant. *Journal of Environmental Health and Journal of Environmental Health and Sustainable Development (JEHSD) Sustainable Development Performance*, 3(2), 17–509.
- Nisa, S. A. (2015). Perancangan Ulang Desain Septic Tank Berdasarkan Pengaruh Penambahan 6% Bekatul Terhadap Produksi Biogas dan Efisiensi Removal Air Limbah Pada Septic Tank Digester (Studi Kasus Bulaksumur Residence). Universitas Gadjah Mada.

- Nuryadi, Astuti, T. D., Utami, E. S., & Budiantara, M. (2017). *Dasar-Dasar Statistika Penelitian*. [http://lppm.mercubuana-yogya.ac.id/wp-content/uploads/2017/05/Buku-Ajar\\_Dasar-Dasar-Statistik-Penelitian.pdf](http://lppm.mercubuana-yogya.ac.id/wp-content/uploads/2017/05/Buku-Ajar_Dasar-Dasar-Statistik-Penelitian.pdf)
- Octy, R., Budhijanto, W., Kimia, D. T., Teknik, F., & Mada, U. G. (2015). Penguraian Limbah Organik Secara Aerobik Dengan Aerasi Menggunakan Microbubble Generator Dalam Kolam Dengan Imobilisasi Bakteri. *Jurnal Rekayasa Proses*, 9(2), 58–64. <https://doi.org/10.22146/jrekpros.31035>
- Priyambada, I. B. (2019). *Efektivitas IPAL portabel sebagai alternatif pengelolaan limbah cair domestik*. 3(1), 235–243.
- Putri, W. A. E., Purwiyanto, A. I. S., Fauziyah, ., Agustriani, F., & Suteja, Y. (2019). Kondisi Nitrat, Nitrit, Amonia, Fosfat Dan Bod Di Muara Sungai Banyuasin, Sumatera Selatan. *Jurnal Ilmu Dan Teknologi Kelautan Tropis*, 11(1), 65–74. <https://doi.org/10.29244/jitkt.v11i1.18861>
- Qasim. (1998). *No Title*.
- Rashid, S. S., Liu, Y. Q., & Zhang, C. (2020). Upgrading a large and centralised municipal wastewater treatment plant with sequencing batch reactor technology for integrated nutrient removal and phosphorus recovery: Environmental and economic life cycle performance. *Science of the Total Environment*, 749. <https://doi.org/10.1016/j.scitotenv.2020.141465>
- Ratnawati, R., & Ulfah, S. L. (2020). Pengolahan Air Limbah Domestik menggunakan Biosand Filter. *Jurnal Ilmu Lingkungan*, 18(1), 8–14. <https://doi.org/10.14710/jil.18.1.8-14>
- Rizki, N., Sutrisno, E., & Sumiyati, S. (2017). Penurunan Konsentrasi COD Dan TSS Pada Limbah Cair Tahu Dengan Teknologi Kolam (Pond) - Biofilm Menggunakan Media Biofilter Jaring Ikan Dan Bioball. *Psychology Applied to Work: An Introduction to Industrial and Organizational Psychology, Tenth Edition Paul*, 53(9), 1689–1699.
- Rossinskyi, V. (2018). Define of internal recirculation coefficient for biological wastewater treatment in anoxic and aerobic bioreactors. *E3S Web of Conferences*, 30. <https://doi.org/10.1051/e3sconf/20183002002>
- Ruzhitskaya, O., & Gogina, E. (2017). Methods for Removing of Phosphates from Wastewater. *MATEC Web of Conferences*, 106, 1–7.

<https://doi.org/10.1051/mateconf/2017110607006>

- Said, Nusa Idaman, Sya`bani Rizki, M. (2014). *Penghilangan Amoniak Di Dalam Air Limbah Domestik Dengan Proses Moving Bed Biofilm Reactor (MBBBR)*. 4(3), 57–71. <http://marefateadyan.nashriyat.ir/node/150>
- Said, N. I., & Utomo, K. (2007). Pengolahan Air Limbah Domestik Dengan Proses Lumpur Aktif Yang Diisi Dengan Media Bioball. *Jurnal Air Indonesia*, 3(2), 160–174. <https://doi.org/10.29122/jai.v3i2.2337>
- Said, N. I., & Widayat, W. (2020). Uji Kinerja Pengolahan Air Limbah Industri Nata De Coco Dengan Proses Lumpur Aktif. *Jurnal Air Indonesia*, 11(2), 49–59. <https://doi.org/10.29122/jai.v11i2.3938>
- Santín, I., Vilanova, R., Pedret, C., & Barbu, M. (2021). New approach for regulation of the internal recirculation flow rate by fuzzy logic in biological wastewater treatments. *ISA Transactions*, xxx. <https://doi.org/10.1016/j.isatra.2021.03.028>
- Santoni, N. A. (2021). *Perancangan dan Evaluasi Start-Up Instalasi Pengolahan Air Limbah (IPAL) Dengan Microbubble Generatir (MBG) Untuk Mengolah Greywater Pada Bulaksumur Residence UGM*. Universitas Gadjah Mada.
- Saputri, E. S. H., Bambang, D., & Karnaningroem, N. (2014). Evaluasi Kinerja Instalasi Pengolahan Air Limbah di Rusunawa Tanah Merah II Surabaya. *Water Conservation Science and Engineering*, 5(1–2), 23–29.
- Setyaningsih, Y. D. (2018). *Modifikasi Proses Lumpur Aktif dan Proses Desinfeksi Pada Pengolahan Limbah Domestik*.
- Suganda, R., Sutrisno, E., & Wardana, I. W. (2014). Penurunan Konsentrasi Amonia, Nitrat, Nitrit Dan COD Dalam Limbah Cair Tahu Dengan Menggunakan Biofilm – Kolam (Pond) Media Pipa Pvc Sarang Tawon Dan Tempurung Kelapa Disertai Penambahan Ecotru. *Journal of Physics A: Mathematical and Theoretical*, 44(8). <https://doi.org/10.1088/1751-8113/44/8/085201>
- Suharto. (2011). *Limbah Kimia dalam Pencemaran Udara dan Air* (Issue 321, pp. 313–317). Andi.
- Sun, G., Gray, K. R., Biddlestone, A. J., Allen, S. J., & Cooper, D. J. (2003). Effect of effluent recirculation on the performance of a reed bed system treating

- agricultural wastewater. *Process Biochemistry*, 39(3), 351–357.  
[https://doi.org/10.1016/S0032-9592\(03\)00075-X](https://doi.org/10.1016/S0032-9592(03)00075-X)
- Tchobanoglous, G., Crittenden, J. C., Trussell, R. R., Hand, D. W., & Howe, K. J. (2003). *Water treatment principles and desing* (Issue 1).
- Terasaka, K., Hirabayashi, A., Nishino, T., Fujioka, S., & Kobayashi, D. (2011). Development of microbubble aerator for waste water treatment using aerobic activated sludge. *Chemical Engineering Science*, 66(14), 3172–3179.  
<https://doi.org/10.1016/j.ces.2011.02.043>
- Torkaman, M., Borghei, S. M., Tahmasebian, S., & Andalibi, M. R. (2015). Nitrogen removal from high organic loading wastewater in modified Ludzack-Ettinger configuration MBBR system. *Water Science and Technology*, 72(8), 1274–1282. <https://doi.org/10.2166/wst.2015.343>
- Torrijos, V., Gonzalo, O. G., Trueba-Santiso, A., Ruiz, I., & Soto, M. (2016). Effect of by-pass and effluent recirculation on nitrogen removal in hybrid constructed wetlands for domestic and industrial wastewater treatment. *Water Research*, 103, 92–100. <https://doi.org/10.1016/j.watres.2016.07.028>
- Uggetti, E., Hughes-Riley, T., Morris, R. H., Newton, M. I., Trabi, C. L., Hawes, P., Puigagut, J., & García, J. (2016). Intermittent aeration to improve wastewater treatment efficiency in pilot-scale constructed wetland. *Science of the Total Environment*, 559, 212–217.  
<https://doi.org/10.1016/j.scitotenv.2016.03.195>
- USEPA. (2007). Wastewater Management Fact Sheet. 21 Octubre 2013, 1–7.  
[http://water.epa.gov/scitech/wastetech/upload/2008\\_01\\_23\\_mtb\\_etfs\\_denitrifying.pdf](http://water.epa.gov/scitech/wastetech/upload/2008_01_23_mtb_etfs_denitrifying.pdf)
- von Sperling, M., Verbyla, M. E., & Oliveira, S. M. A. C. (2020). Assessment of Treatment Plant Performance and Water Quality Data: A Guide for Students, Researchers and Practitioners. In *Assessment of Treatment Plant Performance and Water Quality Data: A Guide for Students, Researchers and Practitioners*.  
<https://doi.org/10.2166/9781780409320>
- Water Resources Division. (2017). *Activated Sludge Process Control: Training Manual for Wastewater Treatment Plant Operators*.
- Wen, Y., & Wei, C. H. (2011). Heterotrophic nitrification and aerobic

denitrification bacterium isolated from anaerobic/anoxic/oxic treatment system. *African Journal of Biotechnology*, 10(36), 6985–6990. <https://doi.org/10.4314/ajb.v10i36>.

Widayat, W., Suprihatin, S., & Herlambang, A. (2018). Penyisihan Amoniak Dalam Upaya Meningkatkan Kualitas Air Baku Pdam-Ipa Bojong Renged Dengan Proses Biofiltrasi Menggunakan Media Plastik Tipe Sarang Tawon. *Jurnal Air Indonesia*, 6(1). <https://doi.org/10.29122/jai.v6i1.2456>

Zhang, X., Zheng, S., Xiao, X., Wang, L., & Yin, Y. (2017). Simultaneous nitrification/denitrification and stable sludge/water separation achieved in a conventional activated sludge process with severe filamentous bulking. *Bioresource Technology*, 226, 267–271. <https://doi.org/10.1016/j.biortech.2016.12.047>

Zhao, L., Dai, T., Qiao, Z., Sun, P., Hao, J., & Yang, Y. (2020). Application of artificial intelligence to wastewater treatment: A bibliometric analysis and systematic review of technology, economy, management, and wastewater reuse. *Process Safety and Environmental Protection*, 133(92), 169–182. <https://doi.org/10.1016/j.psep.2019.11.014>

Zhuang, L. L., Yang, T., Zhang, J., & Li, X. (2019). The configuration, purification effect and mechanism of intensified constructed wetland for wastewater treatment from the aspect of nitrogen removal: A review. *Bioresource Technology*, 293(July). <https://doi.org/10.1016/j.biortech.2019.122086>