SYSTEM OF INFILTRATION PIPE (IP-SYSTEM) AS ARTIFICIAL RECHARGE FOR LAND WITH SEMI-PERMEABLE LAYER OF TOP SOILS

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ABSTRACT

Deterioration of groundwater both quantity and quality is necessary to be addressed through appropriate policies based settings, and they are organized involving various government agencies and, through the means of technical engineering (Danaryanto et al., 2005). Degradation of groundwater can cause various effects, among others: the intrusion of seawater, reduced soil fertility, increase the air temperature and interrupt the cycle of seasons, as well as various other impacts (Darwis et al., 2012). The purpose of this research did discover the shape and type of artificial recharge, to fill the shallow groundwater aquifer with a layer of topsoil which is semi-permeable. This research was a Pre-Experimental Designs with a form of One-Shot Case Study, which was conducted to test the effectiveness of IP-system. Type Pre-Experimental Designs selected in carrying out technical research, due to the implementation of IP-system with a new innovation, that the likely presence of other variables that influence the rise in groundwater level as the dependent variable. While the form of One-Shot Case Study selected as the independent variable observing only one, namely the number of pipes, and the dependent variable was also only one, namely the increase in the groundwater table. Chart-1 to Chart-3, suggests that the number of points added directly affects the volume augmentation occurring. 3 formations of said point being tested, it appears that the relationship between the number of points added to the increase in the level of groundwater is a linear relationship (see Chart 4). This is because the number of formations being tested is still limited to 3 formation, so the optimum point of the number of points added cannot be imaged. Chart-5 to Chart-8, illustrates that the thickness of a semi-permeable layer on topsoil, greatly affect the effectiveness of groundwater recharge. This phenomenon was also experienced in the process of natural recharge, and it can be seen in the increase in groundwater levels in wells control. On the application of IP-system, semi-permeable layer on topsoil, seepage will cause a reduction in cross-section in the pipeline. The relationship between the thickness of the layer of semi-permeable to the groundwater recharge volume is illustrated in Chart 9. Meanwhile, Chart 10, showing the relationship between a depth of rechanging zones with the increase of groundwater levels in test wells.

KEYWORDS: *Rechange, Groundwater Rechange, Artificial Rechange, Semi-permeable, Top Soil*