

시설원에 냉난방을 위한 온도차에너지 열원용 충적대수층 강변여과수 개발

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Riverbank Filtration Well Development for a Heat Source/Sink of Ground Water Heat Pumps

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Riverbank filtration wells have been developed to supply a heat source/sink of water in the alluvium aquifer to ground water heat pumps for cooling and heating of a green house. In order to look for an appropriate site to carry out the research, two sites of Jinju and Gumi areas were investigated. In the results of the electrical resistivity surveys, Jinju and Gumi areas have the alluvium aquifer in the depth of 6~17 m and 10~20 m under the ground respectively. Two boreholes have been drilled in each site of both areas. The averaged water level at Jinju site is about 3 m under the ground, and 3.5 m and 6.5 m of sandy gravel aquifer layers are existed in each site. While Gumi site has 10 m water level and 2.5 m and 4.6 m of sandy gravel aquifer. Therefore, it is expected that 1,000 m³/day of water could be withdrawn at Jinju site rather than Gumi site.

Key words : Riverbank Filtration(강변여과), Alluvium Aquifer(충적대수층), Heat Source(열원), Heat Sink(히트싱크), Ground Water Heat Pump(지하수 히트펌프), Temperature Difference Energy(온도차에너지)

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한강수계 광역상수도 원수관의 지열 영향 조사

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Geothermal Effects on the Underground Water Conveyance Pipe System from Han River

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Geothermal effects on the underground water conveyance pipe system have been investigated through the multi-regional water supply system from Paldang water intake station. To make an investigation of raw water thermal energy, temperature sensors are installed the surface of the pipes of metropolitan area water supply system. In 2009 winter and early spring seasons, the monthly averaged temperatures at Paldang 2 intake stations are 1.94°C in February, 4.96°C in March, and 10.56°C in April. After the transfer in 26.0 km distance of tunnel and buried pipe, the raw water temperatures are raised to 3.13°C, 6.04°C, and 11.39°C respectively. As the temperature difference between the raw water and the air reduces, the temperature increment is reduced by 1.19°C in Feb., 1.08°C in Mar., and 0.83°C in Apr. Since the flowrate is over 1,150,000 m³/day, it is estimated that the water exchanges a huge amount of heat over 1.0 Tcal a day with the ground.

Key words : Geothermal Energy(지열 에너지), Han River Basin(한강수계), Multi-regional Water Supply System(광역상수도), Raw Water Pipe(원수관)

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