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Quality of Riyadh drainage water and its possible utilization

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Saudi Arabia has developed rapidly in the last few decades both in terms of population increase, as well as spatial expansion of irrigated agriculture, industrial and domestic land use. At the same time, water demand has increased rapidly. Such circumstances have had an impact on urban areas such as Riyadh, the capital city of Saudi Arabia. During the last few decades, the city of Riyadh has seen massive urbanization resulting in high population growth. According to statistics, the population of Riyadh has reached more than 6 million people, and the rate of the population growth reached 4% annually. This requires more than 2 million m³ of water per day; two-thirds of which is pumped from desalination plants from the Arabian Gulf in the industrial city of Jubail situated 500 km away. As a result of urbanization, significant hydrological changes have taken place resulting in increase of surface runoff. There are huge amounts of drainage water that flows into wadis south of the city. It is estimated that close to 500,000 m³/d flows out of the city. There are many sources for this flow; the most important are leakage from water and wastewater networks, leakage from soakaway since not all parts of the city are connected to wastewater network, excess irrigation and natural ground water flow. The main objective of this paper is to present the result of an investigation related to estimation of present and future amounts of drainage water from the city of Riyadh. Another objective is to study the quality of this drainage water. Samples from different locations along the path of the major channel of flow were taken and analyzed. Depending on the results, recommendations will be made on the possible reuse of this water.

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