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## Corrosion - Scaling Potentially of Domestic Water Pipelines and Evaluate the Applicability of Raw Water Sources in Basrah, IRAQ

Wasan S. Al-Qurnawi<sup>1</sup>, Hussein B. Ghalib<sup>2\*</sup>, Mazin A. A. Alabadi<sup>1</sup> Adana B. AL<sup>3</sup>Hawash

<sup>1</sup>Geology Department, College of Science, University of Basrah, Iraq

<sup>2</sup>Director of the Scholarships and Cultural Relations Department, Ministry of Higher Education and Scientific, Iraq

<sup>3</sup>Department of Biology, College of Education-Qurna, University of Basrah,

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### Abstract

As a result of changes in the chemical properties of the Shatt al-Arab River, especially in the last decade, as well as the lack of rainfall and the effect of seawater intrusion into the Shatt al-Arab, this study was conducted to investigate the possible changes in the water pipelines like corrosive and scaling which Shatt al-Arab River is the source of water supply for domestic use. Domestic water samples were collected from 10 various locations in Basrah to study the water's tendency to be corrosive or form scales along the pipelines. The Langelier Index, Ryznar Index, Larson-Skold Index, and Saturation Index were used to determine the corrosivity potential of water based on physical and chemical parameters. Most domestic water sources tend to form scales based on the Langelier Saturation Index, Ryznar Index, and Saturation Index. According to the evaluation, the Langelier Index ranged from -1.71 to 1.98, Ryznar Index was between 4.45 and 10.53, Larson-Skold Index was between 1.13 (rainwater) 62.70 (Dibdabba Water) and Saturation Index was ranged -1.31 to 1.24. The results indicated that the rainwater and some groundwater samples are moderately corrosive. The water of all the water resources sampled in this study ranged from balanced to mild scaling. The Larson-Skold Index, on the other hand, shows that all domestic water samples are corrosive. The corrosion and scaling potential of natural water sources collected from groundwater, river water, and rainwater has also been determined.

**Keywords:** Scaling tendency, Corrosion, Domestic Water, Saturation Index, Basrah, Iraq

قابلية المياه المنزلية على حدوث التآكل والتقرشات في الأنابيب المائية وتقييم امكانية استخدام مصادر المياه الطبيعية الأخرى في البصرة، العراق

ومن صبيح حمدان القرناوي<sup>1</sup>, حسين بدر غالب<sup>2,1\*</sup>, مازن عبد العظيم احمد العبادي<sup>1</sup>, عدنان الهواش<sup>3</sup>

<sup>1</sup>قسم علم الأرض، كلية العلوم، جامعة البصرة، البصرة، العراق

<sup>2</sup>وزارة التعليم والبحث العلمي، دائرة البعثات والعلاقات الثقافية، قسم العلاقات الثقافية

<sup>3</sup>قسم علوم الحياة، كلية التربية، جامعة البصرة، البصرة، العراق