



Document details

< Back to results | 1 of 1

↗ Export ↴ Download 🖨 Print ✉ E-mail 📄 Save to PDF ☆ Add to List More... >

View at Publisher

International Journal of Environmental Science and Technology
Volume 17, Issue 3, 1 March 2020, Pages 1439-1454

Experimental study to evaluate the environmental impacts of disposed produced water on the surrounding ecosystems (Article)

Ganat, T.A.^a, Hrairi, M.^b ✉, Mohyaldinn, M.E.^a 🔍

^aDepartment of Petroleum Engineering, Universiti Teknologi PETRONAS, P.O. Box 32610, Seri Iskandar, Perak, Malaysia

^bDepartment of Mechanical Engineering, International Islamic University Malaysia, P.O. Box 10, Kuala Lumpur, 50728, Malaysia

Abstract

✓ View references (32)

The large volume and high salinity of produced water (PW) could pose severe environmental impacts. This paper presents the laboratory results on PW from G oil field, located in North Africa, and on groundwater samples from nearby freshwater wells, in order to best comprehend the chemical composition of PW and to evaluate their potential impact on the surrounding environment of this oil field. Such a sizeable data set can make it difficult to integrate, interpret and represent the results. Thus, multivariate statistical techniques were used in the usefulness evaluation of geochemical groundwater control process classification and identification. Principal component analysis of produced water identified three components: the first being a salinization factor that accounted for 53.6% of the overall variance; the second accounted for 24.3% of overall variance and was mostly dictated by scale forming potential; and the third component (12.3% of total variance) representing the quality of the water formed by the rock water interaction. The aforementioned components demonstrated that the quality of discharged produced water didn't meet national or international standards. For the groundwater analysis, two principal components/clusters were identified. The first one (69.6% of total variance) represented the hardness and salinity of the water, and the second one (18.4% of total variance) can be regarded as the overall effect of weathering and interactions between water and rock on the groundwater quality factor in general. The analysis did not show any contamination in groundwater at the G oil field and in the nearby farms water wells. © 2019, Islamic Azad University (IAU).

SciVal Topic Prominence ⓘ

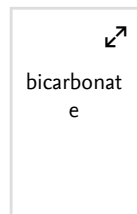
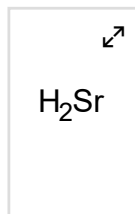
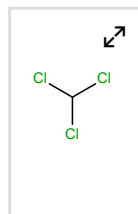
Topic: Water quality | Multivariate analysis | Total variance

Prominence percentile: 93.197



Chemistry database information ⓘ

Substances



Metrics ⓘ View all metrics >



PlumX Metrics

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >

Set citation feed >

Related documents

Status quo of fracturing flowback fluids treatment technologies of US shale gas wells and its enlightenment for China

Liu, W. , Liao, S. , Xiang, Q. (2013) *Natural Gas Industry*

Energy consumption in desalinating produced water from shale oil and gas extraction

Thiel, G.P. , Tow, E.W. , Banchik, L.D. (2015) *Desalination*

Use of ceramic membrane technology for sustainable management of oil production water: A review

Al-Haddabi, M. , Vuthaluru, H. , Ahmed, M. (2015) *Recent Progress in Desalination, Environmental and Marine Outfall Systems*

View all related documents based on references

Find more related documents in Scopus based on:

Authors > Keywords >

Author keywords

Indexed keywords

Engineering controlled terms:

Chemical analysis Cluster analysis Environmental impact Groundwater
Groundwater pollution Hydrochemistry Multivariate analysis Oil fields
Oilfield chemistry Produced Water Statistical process control Water quality Water wells
Weathering

Engineering uncontrolled terms

Chemical compositions Chemistry analysis Groundwater analysis International standards
Multivariate statistical techniques Principal Components Rock water interaction
Surrounding environment

Engineering main heading:

Principal component analysis

GEOBASE Subject Index:

chemical analysis chemical composition chemical weathering cluster analysis
environmental impact experimental study freshwater environment groundwater
groundwater control oil field principal component analysis salinity

Regional Index:

North Africa

Funding details

Funding text

The authors would like to thank Tripoli University for their technical support of this study and all who assisted in this work, especially Professor Bashir Fars for his valuable guidance and providing work facilities. The authors also gratefully acknowledge assistance received from Lynn Mason for editing this manuscript.

ISSN: 17351472

Source Type: Journal

Original language: English

DOI: 10.1007/s13762-019-02558-2

Document Type: Article

Publisher: Springer

References (32)

[View in search results format >](#)

All Export Print E-mail Save to PDF Create bibliography

1 Abdunaser, K.M.

Review of the petroleum geology of the western part of the Sirt Basin, Libya

(2015) *Journal of African Earth Sciences*, 111, pp. 76-91. Cited 3 times.

<http://www.sciencedirect.com.ezproxy.um.edu.my/science/journal/1464343X>

doi: 10.1016/j.jafrearsci.2015.07.005

[View at Publisher](#)