***Investigating Improved ……………………….***

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2Department of …………….., Misurata University

\*Corresponding author:……………………@sci.misuratau.edu.ly

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**Abstract:** Primary production mechanisms do not recover an appreciable ……………………………… ………………………………………………………………………..

**Keywords**: Heavy, Oil, Recovery, Reservoir, Production, Simulation

**Introduction:**

 Improved oil recovery processes broadly encompass all of the measures aimed towards increasing ultimate recovery from a petroleum reservoir. Most reservoirs are subjected to improved oil recovery (IOR) processes following primary recovery. Natural reservoir energies control the ultimate recovery of petroleum during primary production; such drive mechanisms include liquid and rock compressibility drive, solution gas drive, gas-cap drive, natural water influx, and combination drive processes[1]. Primary recovery from oil reservoirs is influenced by reservoir rock properties, fluid properties, and geologic …………………...

**Model Description**

The numerical model used in this study is basically ………………..

**Simulation Scenarios**

GEM was used to model different improved-oil-recovery situations --- water, gas and water-alternating-gas injection mechanisms. Each simulation run is done for a production time span of 20 years, and the cardinal production variables (oil production rate, cumulative oil production, water cut, cumulative gas-oil ratio, flowing bott-omhole pressure, and average reservoir pressure) are examined. It is assumed that there is no permeability alteration in the vicinity of the producing wells; hence no skin factor is set to zero in each production scenario.

Each simulation run is dedicated to a specific production technique that combines a production well and an injection well. The objective of each run is to evaluate how the injection sustains and improves recovery at the production well. Both the production and injection well are controlled by a set of constraints aimed to keep production going for as long as possible and hence raise the levels of cumulative oil production. Table – 2 indicates the constraints set on the production and injection wells.

**Case 1: Vertical Production Well**

This is the base case with which the rest cases are compared. It consists of just a



Fig. 1 Reservoir system

Table 1 Reservoir rock and fluid properties



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