

عنوان مقاله:

Finite Element Modeling of Fluid Depletion and Injection into a Soft Layer

محل انتشار:

اولین کنفرانس ملی مدلسازی در مهندسی معدن (سال: 1397)

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نویسنده:

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خلاصه مقاله:

Underground natural gas storage has attracted remarkable attention during the last few decades especially in depleted porous reservoirs. On the other hand, the emission of carbon dioxide into atmosphere as one of the main greenhouse gases produced by fossil fuel combustion and its geological sequestration is another type of underground gas storage which has gained a considerable attention. Underground gas storage causes the changes in pore fluid pressure which itself causes the changes of the load sustained by the solid particle of the porous structures and causes the deformation of the porous layer as well as the surrounding media that sometimes developed to ground surface and is important from the stability of the ground buildings point of view as well as wellbore. The underground changes of stress and displacement fields result in the change of the load on the wellbores and therefore the study of the changes of stress, strain and displacement field due to gas injection are very important in producing reservoirs (depletion/injection periods). In the current research the effects of the change of underground gas pressure due to gas depletion/injection were studied and focus was on the effect of lateral extension of injected zone in the porous reservoirs. The larger the extension of the injected zone, the higher the effects on the stress perturbation would be. For conducting this study the in-house finite element program developed by the author was employed. The results proved this statement about the lateral extension of the injected zone

کلمات کلیدی:

NUMERICAL MODELING, FINITE ELEMENT PROGRAM, GAS INJECTION, EFFECTIVE STRESS

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