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Testing and exploration of gas wells

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ABSTRACT

Methods and means of testing water wells by exploration or project organization, preliminary study of geological and seismic exploration materials, as well as mine operation, structural and deep drilling, development of drilled wells, and underground storage of produced gas is shown in the program compiled on the basis of the data of other types of work performed by the exploration and geophysical organizations in the area

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Enter. Water wells are tested in accordance with the relevant guidelines when conducting prospecting in aquifers and watered heaps that have been conserved for a long time (if the preliminary geological information on the formation is insufficient for the design of underground gas storage).

Methods and means of testing water wells, preliminary study of geological and seismic exploration materials by the exploration or project organization, as well as mine operation, structural and deep drilling, exploitation of drilled wells, and exploration in the area of underground gas storage under construction. and shown in the program based on the data of other types of work performed by geophysical organizations.

The main parameters of aquifers and aquifers that need to be determined during exploration include:

a) static levels of underground water, stratum pressures and their patterns of change in area, section and time;

b) productivity and volumetric description of the formation and studied wells, distribution of hydraulic conductivity, effective thickness and porosity within the studied area, coefficients of filtration resistance of the bottom zone of the wells;

c) hydrogeochemical indicators of formation waters;

g) average layer temperature and temperature distribution along the well body;

d) the level of strength of the rocks forming the productive horizon of the reservoir-layer or water-flooded layer in the area near the base of the studied wells;

e) residual (current) gas saturation of the hydrated pile (determined by hydrodynamic methods based on geophysical, as well as data on the amount of extracted water and released gas).

If there is an excess pressure at the mouth of the water well, tests in stationary filtration regimes are carried out by means of spontaneous discharge, recording the resulting water consumption and overpressure. In this case, it is necessary to obtain indicators in the 4-5 mode of flow. The last indicator is obtained by installing a controlled or replaceable nozzle.

Before testing the productive horizons of aquifers, the technical condition of the wells, especially if they have been in conservation for a long time, the possibility of using man-made (secondary) piles to create a depression in the tested horizon, as well as the possibility of accumulating the productive part of the horizon in the non-perforated intervals attention is paid to residual reserves of oil, gas and condensate.

Prior to the start of testing, geophysical measurements to assess the condition of gas-saturated intervals and cement rock, modeling of the well body and preliminary cleaning by means of short-term production of the body should be performed.

In cases where there is no excess pressure, the water is pumped with the help of a portable compressor. To establish the regime, it is necessary to change the suspensions of the lift pipes or to create counter pressure at the wellhead. It is allowed to change the driving mode by adjusting the air supply.

After the end of the tests, which are carried out by draining or mode driving with the disposal of formation water, tests are carried out in the non-standard filtration mode. In them, pressure recovery curves are determined after the well is tested by draining, and water level recovery curves are determined after regular driving.

In cases where it is not possible to test the well by regular driving, it is necessary to conduct a test by pumping water into the layer. The water injection method is recommended only in exceptional cases, if the water column in the well is clearly clean and the water injection under pressure does not contaminate the bottom zone of the well. The results of the test are recorded in the well log.

In order to determine the characteristics of receptivity and productivity, well studies are carried out by measuring the consumption of gas and the corresponding pressure difference during gas injection and extraction.

Wells are checked in 4-5 different modes to determine the filtration resistance coefficient of the pre-bottom zone. In this case, an individual plume, a control valve, a flow meter, a separator or a special separator are used.

In order to assess the strength of the rocks in the reservoir layer and the limit flow, it is allowed to release the gas into the atmosphere only in exceptional cases, strictly following the rules of industrial sanitation. It is necessary to try to limit the duration of the inspection as much as possible.

In the research of gas, gas-condensate and gas-water wells, bottom pressure, consumption, and temperature should be measured using depth instruments. The formation pressure in the storage facility should be determined as the average pressure over the area of the artificial gas formation.

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