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RESULTS OF INDUSTRIAL TESTING OF OIL EMULSION DRILLING MUD IN THE USTYURT URBAN AREA

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ABSTRACT

Geological and physical conditions and peculiarities of the development of deposits of high-viscosity oils are given. To study the causes of flooding production of wells, dependencies have been made on the development period, the utilization factor of reserves and the recovery factor of oil. It is established that the rate of watering the production of wells depends on the activity of the water-pressure system.

KEYWORDS: *Deposit, Deposits, Horizon, Reservoir, Watering, Development, Dependence, Water System, Activity, Rate, Selection, Coefficient, Washing, Liquid.*

INTRODUCTION

The specificity of drilling prospecting and exploration wells for oil and gas in the Ustyurt region is accompanied by both normal and difficult mining and geological conditions. The geological structure of the drilled areas, the depth of the productive horizons, as well as the difference in reservoir pressures, require the use of drilling fluids with different densities. One of the main tasks in well construction is the selection of rational types and formulations of drilling fluids, as well as control over their quality during drilling.

However, drilling in the interval of lowering intermediate strings is often accompanied by sloughs, collapses and grooves, which leads to the necessary study, and sometimes to emergency situations. For example, sticking a drilling tool in well. No. 1 pl. Surgil during the opening of thick clay deposits in the interval of 2550-2587 m. The cause of the sticking of the drilling tool was the collapse of the borehole walls. The elimination of the sticking was completed with the drilling of the second borehole. There were also cases of frequent wellbore reaming while

drilling wells. No. 1 Shagirlik in the interval 1835-2035 m there was a deterioration in the quality of the clay solution. As a result, the relative viscosity of the solution increased to "non-fluid", and the fluid loss also rose to 30 cm3 in 30 minutes and the density of the solution reached 1.30 g / cm3. Under these conditions of work, wellbore development is required with continuous treatment of the drilling fluid with the addition of FHLS, UShchR, soda ash and NaOH, to maintain the properties of the drilling fluid within the following limits: specific gravity - 1.18 g / cm3, viscosity 60c and fluid loss 10-12 cm3 in 30 minutes [1,2].

It is difficult to regulate the technological properties of drilling fluids directly during drilling, due to the lack of effective reagents to ensure the required properties.

It is known that the formation waters of this region used for the preparation of drilling fluids differ from other formation waters of Uzbekistan in their aggressive action towards chemical reagents, due to the content of sodium, calcium, magnesium and potassium ions in the water composition in large quantities. The total salinity of formation waters is 20-25%.

When preparing drilling fluids based on formation waters, chemical reagents and materials are consumed several times more than those envisaged in the well construction project in this region. However, despite this, it was not possible to maintain the parameters of the drilling fluids that meet the requirements of well placement in a particular geological section. Considering this circumstance, they abandoned the use of formation waters for the preparation of drilling fluids using fresh water.

Therefore, our experimental laboratory studies were aimed at obtaining oil-emulsion inhibited drilling mud using saline formation waters of the Ustyurt oil and gas region. The use of saline formation water excludes the introduction of inhibiting additives into the composition of the drilling mud, because these additives are in the composition of the formation water in the required amount [3].

On the basis of laboratory studies, we have developed the composition of an oil emulsion drilling mud based on a polymer composition obtained from the waste of an oil and fat plant - (PCM) with the use of aggressive formation waters of the Ustyurt region.

The proposed composition of the oil emulsion drilling mud was tested in the Severny Berdakh area while drilling a wellbore in the interval of 103-910 m.

Well No. 2 of the North Berdakh area was laid in order to clarify the geological structure and assess the effectiveness of the oil and gas potential of the upper, middle and lower Jurassic deposits. Design depth - 4100 m (Paleozoic). In the 0-100 m interval, drilling was carried out using natural clay mud based on saline formation water. The 426 mm elongated direction was run down to a depth of 103 m and cemented. The processing of the working natural circulating drilling mud of the North Berdakh-2 area with the PCM began at a depth of 103 m.Before treatment, the drilling mud had the following parameters:

Specific gravity	1,20 g / cm3
Viscosity	25 sec
Water loss	40 cm3 / 30 min

Peel thickness	6 mm
PH	7,0

According to the operating flow chart, in the interval from 100 to 1600 m, the following chemical reagents were to be used for drilling mud treatment in percentage ratios of the total volume of circulating drilling mud:

Carbon alkali reagent paste	10-15 %
Caustic soda	1,0 %
Soda ash	1,0 %
Reagent K-4	2-3 %
Oil	5-10 %

Drilling of the wellbore for the surface of the Severnaya Berdakh area was carried out with bits with a diameter of 394 mm, accompanied by partial loss of drilling fluid (25 - 30 m3 per day). To maintain the required volume of the circulating fluid continuously without interruption, it was necessary to prepare 35 - 40 m3 of drilling fluid using the above reagents at the required rates. It was delivered to the drilling site pl. Severny Berdakh 8 tons of PCM. For the primary treatment of the working drilling mud, a 10% aqueous solution of PCM was first prepared in an amount of 80 m3. Without stopping the process of deepening the well, they began to inject an aqueous solution of PCM into the circulating solution. After the completion of the PCM injection, the drilling fluid had the following parameters:

Specific gravity - 1.12 g / cm3

Viscosity - 35 sec

Water loss - 20 cm3 / 30 min

Peel thickness - 4 mm

RN - 8.0

After being introduced into the working emulsion drilling mud, the PCMs were additionally treated with a 2% aqueous solution of the K-4 reagent. As a result of the introduction of the K-4 reagent, it was possible to maintain the parameters of the drilling fluid in the required standards, which were provided for in the GTN:

Specific gravity	- 1,12-1,14 г/cm^3
Viscosity	- 40-45 сек
Water loss	- 10-12 $см^3$/30 min
Peel thickness	- 1,5-2 мм
pH	- 8-9

Taking into account the absorption of drilling mud and shedding of unstable rock into the wellbore, it was decided to run the casing string with a diameter of 299 mm to a depth of 910

m.It should be noted that in the process of deepening, working out and preparing the wellbore for running the casing string, the parameters of the drilling mud practically did not change. , tripping operations were carried out without tightening and landings of the drilling tool. During the test period in the well No. 2 pl. Severny Berdakh prepared 250 m3 of drilling mud based on PCM, without the use of caustic and soda ash, and the consumption of K-4 reagent decreased several times. It should be noted that local and bentonite clay was not used to prepare the drilling mud; drilled clay was used in their place. Conductor 299 mm in diameter was lowered to a depth of 910 m without reaming and widening of the wellbore, only with gauging, after which the casing was successfully cemented. The cement slurry rose to the wellhead [4].

The results of industrial testing of emulsion drilling mud based on PCM in the Severny Berdakh area, well No. 2 showed that the process of drilling wells under conditions of salt aggression was carried out without complications and the parameters of the working fluid were maintained in accordance with the GTN ..

In the adjacent well No. 1 pl. Severny Berdakh, despite the huge expenditure of chemicals, failed to maintain the parameters of the drilling fluid provided for in the GTN. Thanks to the use of PCM in the treatment of circulating drilling mud, 2420 kg of caustic soda, 2985 kg of soda ash, 5975 kg of K-4 reagent, 36315 kg of clay and 1873 kg of oil were saved.

Based on the positive results obtained from testing oil emulsion drilling mud in well No. No. 2 on the Severny Berdakh area, this composition is recommended for industrial implementation in the drilled wells of the Ustyurt region.

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PCM-Polymer composite material
UShchr- Carbon alkali reagent
GTN - Geological and technical outfit
NTF- Nitrilotrimethylphosphonic acid (white powder)
FHLS- Ferrochromlignosulfonate
CMC - carboxymethyl cellulose
K-4 - polymer reagent
CITS - central engineering and technical service
UBR - drilling operations department
pH - pH, a measure of the acidity of aqueous solutions