

Characteristics of Sandy Debris Flow Reservoir of Upper Triassic Yanchang Formation Chang 8 Member in Southern Ordos Basin, China

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Abstract. Means and methods have undergone earth-shaking changes. Ordos basin has been a new important energy strategy experiment and development base in our country, especially dense reservoir of Yanchang formation of Ordos basin has also intensified its efforts for reservoir exploration and development, and in alignment with the reservoir structure for our country in the region on the basis of oil and gas development projects and to lay a new foundation. Detection results show that the sandy debris flow reservoir of upper Triassic Yanchang formation Chang 8 member main characteristic is its soil layer thickness is small, but as a whole the accumulative thickness is big, plus its sandy debris flow reservoir horizontal continuous geological factors such as poor continuity, increased difficulties of oil and gas development in the region. Therefore, in the process of practical exploration and development, not only need to consider the Chang 8 member sandy debris flow reservoir of southern Ordos basin characteristics, also need to water seepage neutral sedimentary theory as the development basis, considering historical materials about the content of core, logging, etc, to ensure sustainable development in the region.

In Chang 8 of sandy debris flow in southern Ordos basin main characteristics and the cause of the reservoir geological profession has always been a controversial greatly one aspect, the sand body of Yanchang formation sedimentary structure of sandy debris flow, the condition of the geological sedimentary factors are the development process in the region to fully assess the natural factors. Long-term since, our country Chang 8 member in southern of Ordos basin regional development has experienced the process from the play to the underground water, but with the continuous progress of detection means, the geologists and sandy debris flow in the region have the further understanding of the characteristics of a reservoir.

Therefore, in this article Chang 8 member in southern Ordos basin facies study, make full use of the casting thin sections, scanning electron microscopy (SEM), X-ray diffraction and C: T scan scientific methods, such as, the regional geological conditions, the condition of sandy debris flow deposits, sandy reservoir characteristics, main controlling factors for reservoir research, found in the search for a high quality layer distribution, trying to ooze water in the basin deposition in China especially the exploration and development of enterprise to provide strong theoretical and practical support.

I. Southern Ordos basin geology

Ordos original is part of the long table of north China platform, early Paleozoic with arch on the mantle, up to the Qinling-Qilian trough, Chinese ancient land collapse, divided into Tarim platform and Yangtze platform. Long table at the end of the Mesozoic Jurassic of north China is a unified whole, to the cretaceous uplift in Shanxi region, along with the north China platform and Ordos platform separation, form independent basin. Ordos basin has the Achaean group and early Proterozoic metamorphic crystalline basement and the overlying in has in the ancient world, upper Paleozoic and Mesozoic sedimentary cover.

In southern Ordos basin for the basin tectonic belt, has found that many broad ring of geological structure. Many scientific theoretical research show that the annular structure is a relatively independent block, its activities both rise and fall, and rotation, controlled by the deep, mainly in - Cenozoic orogeny (Indosinian movement, Yanshan movement well-developed) the result of joint action, with basin of coexistence of multiple energy minerals have important control action.

Because of the large southern Ordos basin terrain ups and downs of the landscape is rich, has a long history of development, under the combination of these factors lead to the region geological structure is complicated. Especially in southern Ordos basin sandy debris flow reservoir of Chang 8 member sedimentary environment is more complex, at the same time in the exploration and development need when considering the different geologic factors, especially under the sedimentation of sandy debris flow instability, aggravated the uncertainty in the process of development. Therefore, along with the continuously go deep into the study of deep-water gravity, secretary of the industry in southern Ordos basin Chang 8 member sandy debris flow characteristic of the reservoir will have a more clear understanding, to guide the concrete practice.

II.Sedimentary characteristics of Chang 8 member debris flow reservoir Yanchang formation in southern Ordos basin

Chang 8 member sandy debris flow in southern Ordos basin as a massive fluid has its unique characteristics, its elastic surface generally show fluid state, and at the bottom of the relatively strong corrosion resistance, the top is under the action of natural environment, present a different form, and form with the upper strata of jagged state. According to the theory of sedimentary rock, bulky sandy debris in geology under the action of collision, the stranded between geological layers; And finely sandy debris will under the action of natural selection at the top of the block sandstone.

Considering the nature sandstone rock within the relatively uniform, the characteristics of the rock under the influence of sedimentation, different properties of rock by stratified precipitation formation and also mixed with sandy slump, the mudstone in the process of filling layer and level of low Angle cross bedding.- low level of the latter form of "Angle" cross-bedding mainly formed by single phase of sandy debris flow deposits, and mixed with the thickness of smaller fine sandstone and mudstone, presents the irregular distribution of state.

By studying the south Ordos basin Chang 8 member of sandy debris flow reservoir core sample for scientific research and observation found that rock layer due to the moisture content in the region is rich in the lake area, the volume of sand body and more thick, so excellent lubricity. In the thick gravel quality, present a slender, usually appear in the rocks in the upper, and belong to the basic characteristics of sandy debris flow.

III.Reasons for the sandy debris flow reservoir of Chang 8 member Yanchang formation in southern Ordos basin

(I).The characteristics of the reservoir rock

Through the analysis of the status of the reservoir rock in the region, we found that the area mainly fine grained lithic arkose and feldspathic lithic sandstone, with small amounts of carbonate debris.In the state of the nature of the rocks, the most common are extrusive rock cuttings, phyllite and biotite minerals such as rock and composition.

In terms of the smooth degree of the rock, in the rock particles support, under the action of eroded rock show "edge" on the "second round" state. For the plastic good rock, is given priority to with a line contact.

(II).Rock pore

The Chang 8 sand rock pore in southern Ordos basin are mainly intergranular pore and intragranular dissolved pore, and intergranular pore and fracture in soil several main types, and each presents different characteristics. Intergranular hole, for example, is refers to the rocks formed in the development of residual intergranular pore and intergranular corrosion resistance enlarge hole. In

cuttings content less area is easy to form the residual intergranular pore, and on the edge of the clastic rocks of the region are more susceptible to natural erosion and gradually formed intergranular corrosion expansion of hole.

In addition, due to the southern Ordos landscape diversity, complex geological formation, formed in the complicated environment formation fracture development degree is high, the form is given priority to with vertical Angle and high development. This natural fracture is not only a superficial penetration space of the oil and gas resources, also can to a certain extent the volatilization of reservoir protection, gradually formed a natural oil and gas storage layer.

IV.The Chang 8 member Yanchang Formation in southern Ordos basin sandy debris flow analysis of reservoir characteristics

Chang 8 member in southern Ordos basin sandy debris flow of the reservoir is mainly on the role of the geological sedimentary, diagenesis and tectonic effect under the common effect of three aspects. And sedimentation in it is the most basic function, on the later diagenesis and tectonism and varying degrees of impact. Therefore, these three role in south Ordos basin Chang 8 member of sandy debris flow in the reservoir is interdependent and interactional relationship, lost any action can see today's unique landscape and natural structure.

(I).Sedimentation

In sandy debris flow processes of reservoir formation deposition in which have the effect of the "golden link". In the process of deposition, not only for sandy debris will step by step screening, filtering, and precipitation, more will impact on the sediment erosion of the body, and finally form the natural phenomena such as debris flow, natural slump. A "sliding block these forms deposits, slump, debris flow," after the three stages of screening and layered deposits, gradually formed a sandy debris flow of the reservoir, and can promote the densification process of the reservoir, help the formation of oil and gas gathering, to protect oil and gas from volatilization.

(II).Diagenesis

Diagenesis of also plays an important role to the formation of reservoir, mainly reflected in the following three aspects: compaction, cementation and dissolution. Mainly refers to the mechanical compaction, for example, for glory, not the forces of nature. Compaction is aimed at the plastic debris plays an important role, but the region of plastic debris released zone condition is more complex, is not very obvious compaction. Such as again, the dissolution is a key factor in the reconstruction of low permeability sandstone reservoir, in the region is mainly embodied in two aspects of feldspar dissolution and debris dissolution. Feldspar dissolution often honeycombing dissolution pore, porosity is higher, the product of its dissolution will gradually in space or into kaolinite.

(III).Structure

Geological structure of Chang 8 sandy debris flow reservoir in south Ordos basin is the product of historical role, after much period under the condition of geological structure, fracture development in the region gradually mature, and has laid a solid natural conditions for especially production. Industry thought, on the one hand, these cracks will effect on the reservoir construction, because they are in the process of growth will continue to develop new cracks and will this process continue indefinitely; Mature cracks, on the other hand, is likely to be oil field development and exploration of safety test. This request related professionals in fully understand the southern Ordos basin Chang 8 member of sandy debris flow based on the geological structure of reservoir, the exploration and analysis on the different geological structure, and design the corresponding development plan, would improve the safety of oil and gas construction, provide more care and support for the workers to work.

VSummary

To sum up, this article mainly through to the secretary of the Chang 8 member of sandy debris flow reservoir in southern Ordos basin features a detailed analysis of theory and practice, put forward

some beneficial ideas and methods for the exploration and development in the future. In full consideration to the secretary of the south Ordos basin Chang 8 of sandy debris flow of the reservoir has a "single phase of the debris flow scale is limited, thickness of sedimentary period more debris flow as a whole big" the characteristic, in the development process needs to pay attention to the flow of the section of sandy debris flow, flow velocity and sediment problems. In addition, the southern Ordos basin Chang 8 sandy debris flow in the reservoir under different landforms of lithic content and impurity content changes also have bigger difference, also need to consider the permeability of different geological features. Effect, therefore, exploration and development in southern Ordos basin geology condition is diversity, synthetically considering the area district Chang 8 sandy debris flow on the basis of reservoir characteristics, integrated with the advanced technology, to ensure the smooth progress of China's oil and gas resources development in the area, the region's natural resources development and the combination of economic development, for our country's great contributions to the economy to achieve sustainable development.

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