

Research of Putaohua Reservoir Sedimentary Microfacies Distribution Law

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Abstract: Through the study of sedimentology study all kinds of geological data; determine the putaohua reservoir sedimentary facies types, on the basis of dense well pattern detailed anatomy in the development zone, this article use in combination with well shock, comprehensive logging, core data and stratigraphic section to study the sedimentary microfacies.

Keywords: geological data, sedimentary facies, comprehensive logging.

PUTAOHUA OIL LAYER SEDIMENTARY BACKGROUND

Putaohua reservoir is located in the songliao basin in cretaceous yaojia, is one of the main oil-producing formation in northern songliao basin, the thickness distribution is commonly 21 to 76 metres, is given priority to powder sandstone, fine sandstone and argillaceous siltstone, and it is made mainly include fan delta sedimentary system and sedimentary system composed of normal delta sedimentary system [1].

Putaohua reservoir produced in songliao basin depression period secondary sequence of relatively flat terrain, climate, drought, provenance supply adequate, lake area is relatively low water period, so the putaohua reservoir is given priority to with shallow water lake delta sedimentation. Shallow water lake delta front facies belt and classic delta front facies belt has a great deal of different pattern, the main differences are. When

putaohua reservoir sedimentation, the ancient background relatively flat topography, slope is relatively small, relatively dry climate, lake water body area is lesser, water is relatively shallow. The shallow water delta river energy is greater than the water, the terrigenous clastics carried by rivers into the lake, the distance is far from north to south, far more than 149 km. lake deposition frequently exposed or close to the surface of the water, there is no typical deep lake, half deep lacustrine deposits [2]. Shallow water lake delta sedimentary model does not have typical delta deposition layer, Gilbert foreset and bottom laminated ternary depositional model, give priority to delta front facies sedimentary body, wide, can reach hundreds of kilometers, covering the whole basin, directly and characterized by frequent exposure to the characteristics of the water. Delta front facies consists of inside outside leading edge and leading edge. (Figure 1).

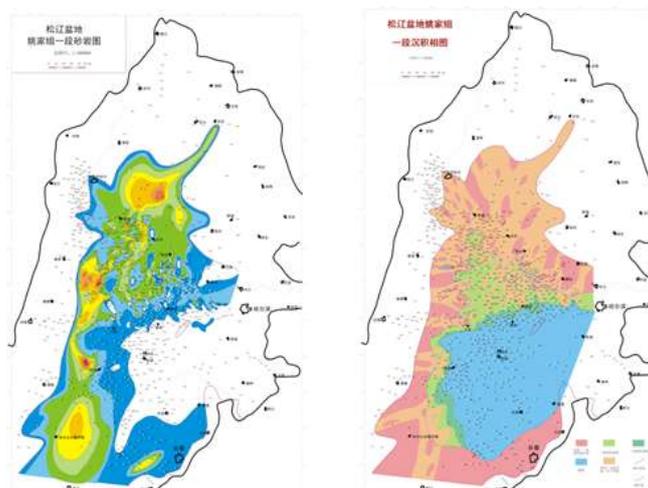


Fig. 1: Putaohua reservoir sandstone isopach map of songliao basin Putaohua oil layer of songliao basin sedimentary phase diagram

THE SEDIMENTARY FACIES TYPES AND CHARACTERISTICS

Conventional planar sedimentary microfacies research generally includes, the statistics on the single well each interval of strata thickness, sandstone thickness and sand ratio and other data, considering the well logging curve of each interval in well point as the control point, drew within the work area of the contour map, and then analysis the sand body distribution situation on the plane and determine the work area of the sedimentary microfacies distribution [3]. But less between Portugal and north eastern oil field blank area development well, only by well information plane distribution of sedimentary microfacies study, accuracy is far from enough. According to the above situation, the development zone with dense well pattern, on the basis of detailed anatomy, use well in combination with shock, comprehensive logging, core data and stratigraphic section of the sedimentary microfacies are studied [4].

The key technology of seismic sedimentology is the stratigraphic section, a synchronic stratigraphic

section along the two interpolation out of proportion between slices in a series of dimensions to study the sedimentary system and the plane distribution of sedimentary facies of the technology, reflect the seismic attributes of geological time interface according to the stratigraphic section can reliably identify sedimentary system of high resolution sequence, sedimentary sand body analysis can be improved [5].

In study, by phase conversion technology, generate 90 degree phase transform data body, on the basis of improving resolution processing, generated the pu north, tai 30, pu 47 seismic work area of the three strata slicing. The validation and comparison in PI5 to PI6 time unit, slice images with sand body alignment is higher, has certain reference value, reference stratigraphic section describe the sand body distribution rule, and through the thickness of sand body and each unit layer of well logging curve feature recognition every phase of the well type, map the sedimentary microfacies in the study area [6].

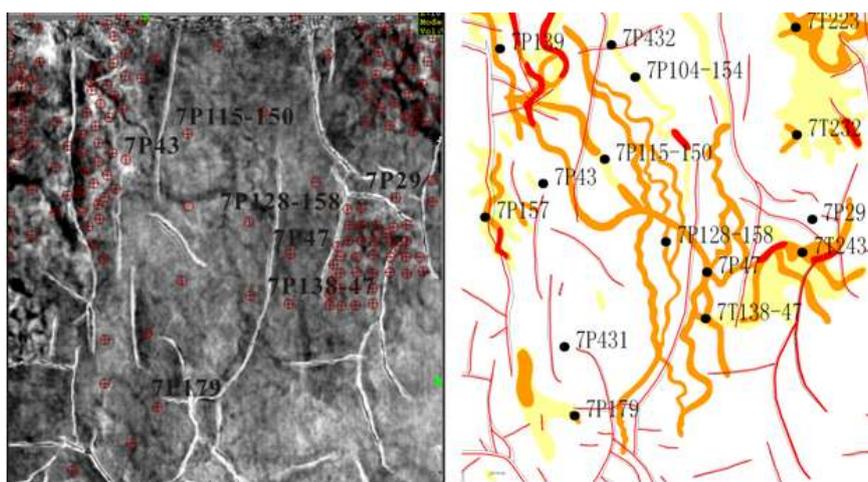


Fig. 2: Strata slicing and sedimentary microfacies comparative verification

Through the core of the color, texture, structure, lithology and rock cyclicity, composition, authigenic mineral, special contents, petrological characteristics, such as fossils, logging facies elements, single sand body characteristics, sedimentary background, the microfacies spatial configuration etc. Comprehensive analysis, putaohua reservoirs with large fluvial-dominated shallow water delta facies, to identify the delta front one subfacies and five microfacies.

DEVELOPMENT ZONE OF SEDIMENTARY MICROFACIES DISTRIBUTION RULE

According to the study area sediment grain size analysis, core observation, combined with logs, lithology, grain size, and sand body distribution [7]. Ang the Pu 128 and Tai 232 development blocks too dense well spacing was fine dissection, to summed up

the zone sand body distribution characteristics on a plane, Pubei oilfield Pu 1 group reservoir is the underwater delta front facies, formed that experiencing decline in the lake, the stable lake, rising lake depositional environment, with multi-level views sedimentary cycles. Bottom-up can be subdivided into seven kinds of sub-subdivision phase- outer front lake regressive, Lake retreat-type transition phase, regressive leading edge of the lake, in the stable leading edge, type the leading edge of the lake, the lake into the type of phase transition and into the type of outer front lake.

Outer front sand thickness is thinner and layer is stable, continuous distribution on a large flat area, mainly developed body sheet sand and non-body sheet sand, widely used in the PI1, PI53, and PI103-PI113 time unit distribution. Transition sand body was intermittent and instability sheeted banded, connectivity,

poor continuity, mainly developed shallow underwater distributary channel, sheet sand body, non-body sheet sand and widely in PI21 to PI32 and PI101 to PI103 time distribution unit [8]. Inner front sand body thickness greater was intermittent strip, roughly north-south distribution, mainly developed underwater distributary main channel, underwater distributary channel and shallow sheet sand body in PI41-PI92 time units wide distributed.

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