Scholars Bulletin
(A Multidisciplinary Bi-weekly Journal)
An Official Publication of "Scholars Middle East Publishers",
Dubai, United Arab Emirates
Website: http://scholarsbulletin.com/

ISSN 2412-9771 (Print)
ISSN 2412-897X (Online)

PU XI Oilfield, Putao Hua oil layer fluid Identification standard

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Abstract: This paper based on crossplot and core data, analysis the Pu Xi oilfield, Putao Hua oil layer 's conventional logging response characteristic. Based on the describe of the three cored wells, Putao Hua oil layer is mainly made up with oil-water zone, and judging the Partial oil or water is very difficult. First normalized the well logging curves, elimination the influence of the nongeological factors to the well logging curves.After that, establishe the logging data intersection, and identify the lithology. The lithology crossplot are mainly depand on ΔSP, GR, HAC, RLLD, RLLS.ILD, ILM At last ensure the fluid standard.

Keywords: Pu Xi oilfield；Putao Hua oil layer；crossplot；fluid standard.

INTRODUCTION

With the rapid development of economy in our country, The demand of resources is growing,the exploration and development also have higher requirements [1]. The fluid identification standard is one of the most important steps in the process of oilfield exploration,accurately fluid standard, is very impotant to find main oil-producing formation,and found the residual oil. Pu Xi oilfield is located in Zhao Yuan and Durbat monggol nationality autonomous county in Heilongjiang province.This area's ground conditions is complex, most place are low-lying land, altitude 132～151m.Mainly with mouth bar、distal bar、sand sheet、distributary channel sand body [2].

Putaohua reservoir using the data of 29 single test;Try two layers of oil or oil and water production data 17;Three layers test 3;Well history data and 13 single perforation;Annulus data 29;Fracturing of the 24 [3].

The establishment of the dry layer standard

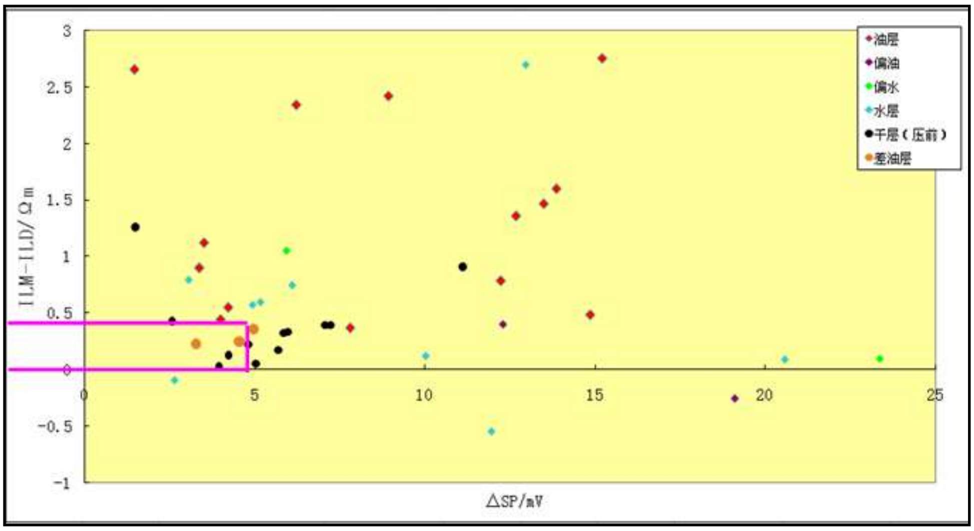

Fig-1: The dry layer standard of Putaohua oil layer

Before the oil and water interpretation ,we should distinguish the dry layer and the poor reservoirs [4] (for dry layer before fracturing, oil production after fracturing or oil-water layer), establish the SP and (ILM - ILD) chart,for dry layer and the poor oil layer identification chart, from fig 1, you can see, dry layer and poor reservoirs are mainly distributed in delta SP low-value, (ILM - ILD) low area, was right in the picture.0 < (ILM - ILD) < 0.4378, SP < 7.2368 mV for dry layer and poor reservoirs.Two mistakes, cause of misjudgment point 1 is the dual-track effect, lead to abnormal high value of (ILM - ILD) [5].

On the whole data established the fluid distribution standard

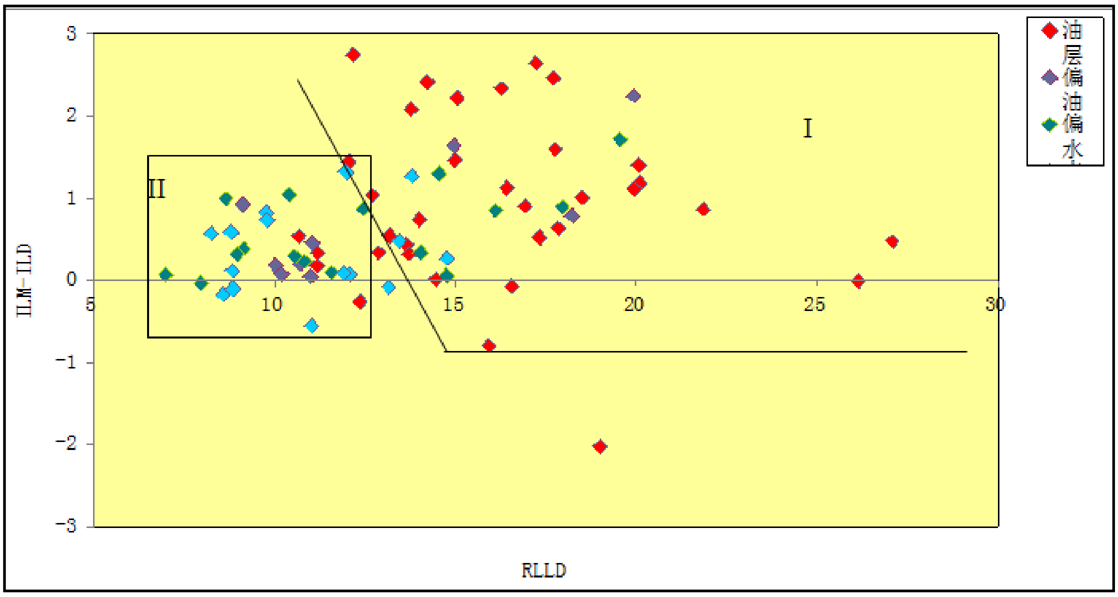

Fig-2: Putaohua overall fluid distribution

As shown in figure 2, with RLLD intersection by (ILM - ILD) as you can see, putaohua reservoir fluid distribution is complex, high water-resistant and low resistance oil layer, I the more water is contained in normal oil reservoir, oil and water fall from tree [6], II mixed fluid distribution, reservoir, oil and water, tree layer mixed distribution, based on the principle of partition layered different lithologies of the establishment of a flow chart for research [7].

Established the standard with the test way

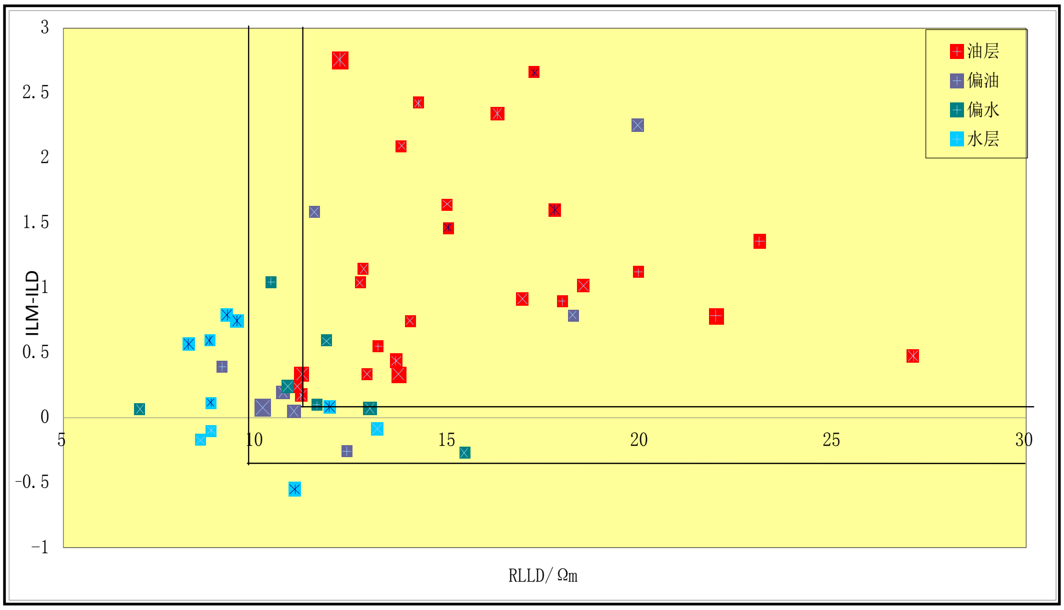

Fig-3: Established the standard with the test way

According to the test, the data points can be divided into fracture and infracturie, data points of the fracturing fluid identification standard is established [8]. As shown in fig 3, remove the point after fracturing, reservoir water layer boundaries is clear, RLLD > 11.082Ωm, (ILM-ILD) > 0.178 for the oil; 9.512 Ω m < RLLD < 11.082 Ω m, 0.178 < (ILM - ILD) < 0.258 for oil-water the rest for the water layer.

According to the fig 3 we can find out the standard in chart 1 the comprehensive coincidence rate is 84%, but the oil-water peer recognition precision is low [9].

Discriminant result / actual result	Oil layer	Oil and water layer	Water layer	Coincidence rate
Oil layer	25	0	0	100%
Oil and water layer	4	9	2	60%
Water layer	0	2	8	80%
Comprehensive coincidence rate =42/50=84%				

Determine the partial oil partial water boundaries, and distinguish partial oil or water

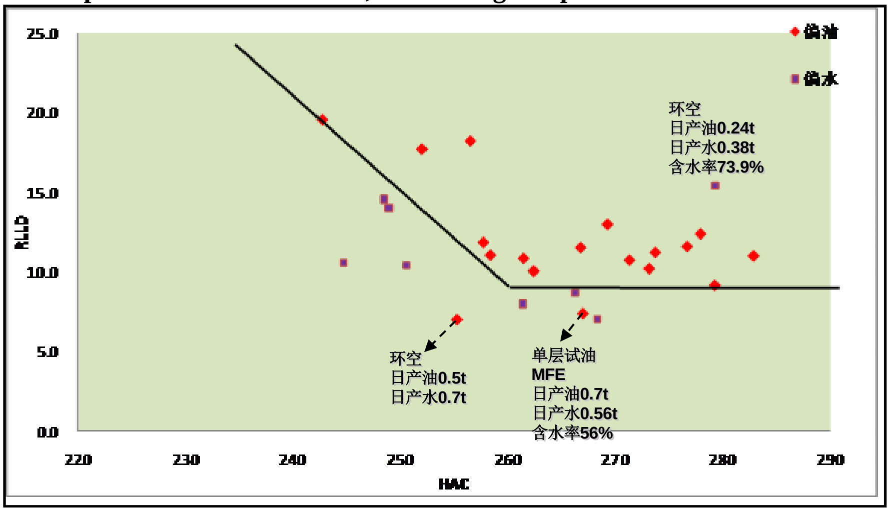

Fig-4: Partial oil or water to distinguish standard

As shown in figure 4 to judge the fluid identification standard of the partial oil or water, by creating the chart of HAC and RLLD intersection judgment of the oil-water provided partial oil and water layer. A partial oil partial water limit set at 64%. RLLD > 1.6 * HAC - 405.4, RLLD > 9Ω m for partial oil; if not partial to the water [10].

CONCLUSION

Putaohua reservoir using the data of 29 single test; Try two layers of oil or oil and water production data 17;Three layers test 3;Well history data and 13 single perforation; Annulus data 29;Fracturing of the 24.Made the dry layer standard , the oil, oil-water, water, and water standard , the Partial oil or water to distinguish standard.

- Use the SP-(ILM-ILD) cross plot to made the dry layer standard of Putaohua oil layer. .When 0 < (ILM – ILD) < 0.4378, SP < 7.2368 mV for dry layer and poor reservoirs.
- Use the RLLD- （ILM-ILD） cross plot .When RLLD > 11.082Ωm, (ILM-ILD) > 0.178 for the oil; 9.512 Ω m < RLLD < 11.082 Ω m, 0.178 < (ILM - ILD) < 0.258 for oil-water the rest for the water layer.
- Use the HAC-RLLD cross plot to identificate the partial oil or water. When RLLD > 1.6 * HAC - 405.4, RLLD > 9Ω m for partial oil.

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