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STRATIGRAPHY AND PETROLEUM GEOLOGY OF THE  
J SANDSTONE IN PORTIONS OF  
BOULDER, LARIMER, AND WELD COUNTIES, COLORADO

by  
Untung Suryanto  
1979

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A Thesis submitted to the Faculty and Board of Trustees of the Colorado School of Mines in partial fulfillment of the requirements for the degree of Master of Science in geology.

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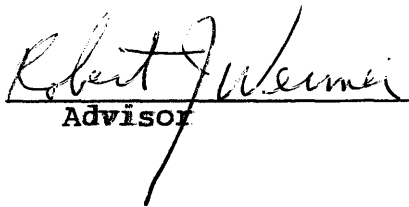
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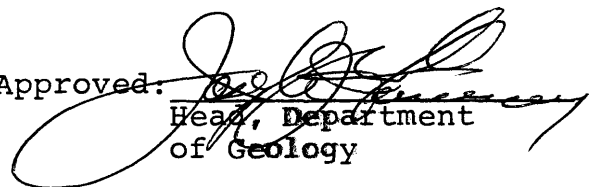


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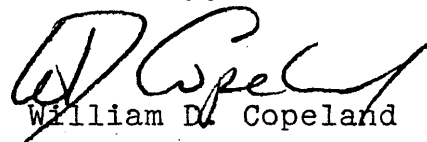
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ABSTRACT

The J Sandstone was studied in a more than 500 square mile area on the west-central margin of the Denver basin. Outcrop of the Lower Cretaceous J Sandstone from the city of Lyons north to Horsetooth Reservoir, Colorado, show a regressive cycle of continuous deltaic and interdeltic sedimentation. High constructive prograding deltas developed in the eastern and western portions of the study area, and are designated the east delta complex (source from east) and west delta complex (source from west). To the north, the west delta complex laterally changes to interdeltic environments that were highly influenced by tidal fluctuation. Consequently the delta plain deposits laterally change to other-type coastal plain deposits.

Two tectonic events occurred during early Cretaceous time with widespread uplift, or eustatic sea level change, at the end of the deposition of Lytle Formation; and, local uplift and/or eustatic sea level change at the end of the deposition of the J Sandstone. Local basement-controlled block faulting near the end of Albian time elevated segments of the J Sandstone with subsequent removal by erosion of at least 10 ft (3.2 m) of the upper portion.

The J Sandstone is divided into lithologies that result from two major depositional environments:

a lower unit of marine delta front deposits; and, an upper unit of delta plain-coastal plain deposits. The marine delta front deposits can be further divided into lower marine delta front and upper marine delta front. The delta plain-coastal plain deposits are composed of crevasse splay delta, distributary channels, marine bay, fresh water bay, and river estuaries. Thin transitional deposits of transgressive sands and beaches are also part of the J Sandstone. The marine delta front deposits are very fine-to medium-grained sandstones characterized by coarsening upward sequences and abundant trace fossils. The delta plain-coastal plain deposits are characterized by uniform grain size or slightly fining upward sequences in fine-grained sandstones that are intercalated siltstones and shales. Root zones are commonly observed.

Correlation between surface and subsurface sections is generally good. Core data show similar sequences in the subsurface as observed in the surface exposures. However, presently available subsurface log data are not always useful in predicting environments of deposition.

Important petroleum occurrences are found in the J Sandstone in this portion of the Denver basin. Due to permeability problems in the J Sandstone reservoir, only the Wattenberg gas field has significant economic production at present. Subsurface evaluation indicates that small struc-

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tural and stratigraphic traps remain undiscovered in the study area. The key for future discovery is the knowledge of local tectonics and permeable sandstone occurrence related to facies distributions.

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The original material for this dissertation includes a significant number of oversized pages. The full text can be viewed by accessing the supplement file.

