INFORMASI FOSI

- Dalam pertemuan tahunan IAGI yang ke 25 di Bandung pada tanggal 11-12 Desember 1996 lalu, IAGI telah menerima FOSI sebagai salah satu komisinya. Hal-hal yang bersangkutan dengan keorganisasian akan dibicarakan lebih lanjut antara para pengurus FOSI dan IAGI. Penerimaan itu dilakukan sendiri oleh ketua umum IAGI, Bpk. Abdul Wahab, dalam rapat anggota tahunan IAGI.

- Sehubungan dengan pertemuan tahunan IAGI ke 25, FOSI dan SEPM (Society for Sedimentary Geology) yang berpusat di Tulsa, Oklahoma-USA, membuat sebuah stan pameran. Stan ini juga disponsori oleh Shell Companies in Indonesia. Dalam pameran ini FOSI memberikan informasi mengenai program-program dan publikasi-publikasinya. SEPM sendiri memamerkan buku-bukunya yang berkualitas internasional dengan harga yang relatif murah (potongan harga sampai 75%; daftar buku dapat dilihat pada halaman.11).

- Sebuah proyek sedang dijajaki yaitu pembuatan atlas fosil jejak (trace fossil) bagi anda yang tertarik untuk mengisi atlas tersebut harap memberikan: 1). foto atau sketsa fosil jejak, 2). Deskripsi dan interpretasi (jika ada) 3). Lokasi penemuannya (dengan peta jika ada), 4. Kolom stratigrafi (jika ada). Data-data tersebut dapat dikirimkan kepada editor FOSI dan akan dibukukan sebagai atlas.

Info Buku Murah

Sediment-hosted Mineral Deposits (Parnell et al; 1990), Coarse Grained Deltas (Colella & Prior; 1990), Foreland Basins (Allen & Homewood; 1986), Sedimentation in Oblique-Slip Mobile zones (Ballance & Reading; 1980), The Seaward Margin of Belize Barrier and Atoll Reefs (James & Ginsburg; 1980), Pelagic Sediments on Land and Under the Sea (Hsu & Jenkyns; 1975).
Harga masing-masing buku di atas £5 diterbitkan oleh Blackwell.
Untuk informasi selanjutnya silahkan menghubungi editor majalah ini.

Mengenai Gambar Sampul

Selang-seling gamping merah pelagis dan rijang radiolaria merupakan ciri endapan laut yang sangat dalam (abyssal), juga merupakan ciri dari permukaan kerak samudra. Beberapa sumber menyebutkan bahwa satuan batuan ini merupakan olistolith. Urutan ini sering disebut sebagai sedimen pleagos-biogen (Asikin, S. person. comm.).

Turbidite Reservoir Main Control and Quality

by Herman Darman (SHELL Companies in Indonesia)

1. Introduction

Turbidite sandstone can form important reservoir rocks. Some giant oil fields with recognized ultimate recoveries larger than 500 million barrels have been found in turbidite deposits. Some major reservoir units in the North Sea Basin are interpreted as multiple stacked submarine lobes with little evidence of channeling (Parsley, 1990). Other giant turbidite reservoirs were also found in the US (Schweller, et al., 1988; Slatt et al., 1988) and other fields in the world.

Turbidite sand bodies are deposited by subaqueous gravity processes in submarine fan environments. The sand lobes and sand-filled channels on the submarine fans often act as hydrocarbon reservoirs. Forties Field, Miller Field, Frigg Field in the North Sea, Inglewood Field and Wilmington Field in USA are good examples of turbiditic reservoirs in the world.

The essential properties of the reservoir rock to enable it to store hydrocarbons and eventually permit them to flow into wells are porosity and permeability. Grain size, sorting, composition, and packing control these basic properties. Even though turbidite sandstones are generally poorly sorted, the large geometry makes them valuable as reservoirs. The lateral changes of turbidite deposits represent stratigraphic traps.

In some cases the turbidite formation is not productive due to its certain characteristics. Within these non-productive turbidite formation, the porosity and permeability have been reduced by some processes and internal properties. For example ductile mineral composition, high tectonic compression, and effective cementation often cause pores to decrease in size.

2. Main Control

Sandstone bodies play the most important role as a reservoir in the turbidite system. The thickness of the sandstone body varies from centimetre to meter scale and the grain size mostly ranges from fine to medium. Occasionally clay clasts occur in the lower part of the thick sandstone bodies. The bed thickness and grain size are normally consistent. The thicker the sandstone body, the coarser the grain size. The

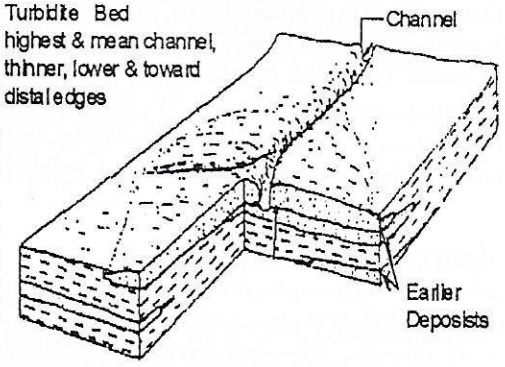


Fig. 1- Conceptual model of a deepwater fan sequence (Richardson et al., 1987)

thickness and the porosity, however, are inconsistent. Most ancient turbidite sands are immature; they are rich in clay matrix and have a framework of poorly rounded and sorted unstable mineral grains (Pettijohn et al., 1972).

2.1 Composition.

Sandstone mineral composition influence the porosity and permeability of turbidite sandstones. The composition in most of oil fields are dominated by quartz and feldspar, classified as arenitic sandstones and wacke sandstones. The quartz minerals form good reservoir sandstones due to its high resistance to the compaction. The feldspar mineral is more ductile. High compression will easily change the shape of the feldspar minerals and make them fill-in the pores. The feldspar minerals are also easily weathered and become clay mineral, which commonly reduced the pore sizes. The rock fragments, terrigenous and skeletal carbonate, and volcanic debris may be conspicuous, even predominant components of the framework. Skeletal debris commonly consists of both shallow and deep-water origin. Carbonate cements dissolved from carbonate fragments fill in the pores and decrease the porosity.

Glauconite minerals may be present and carbonaceous material is common in the turbidite deposits. Micaceous sands mostly act as barriers to vertical fluid rise (Brewster, 1991). Clay and biotite which occur as grain coats decrease the porosity of the turbiditic sandstone such as in turbiditic reservoir of the Inglewood Field (Schweller et al, 1988). Porosity decrease in turbidite sandstones of the Frigg Field was partly caused by the carbonate cements.

Unconsolidated sandstones occur in Forties Field and Wilmington field caused by poor cementation (Slatt et al., 1988; Wills, 1991). Lack of cement makes the pores remain empty. Therefore, porosity and permeability are high. On the other hand, intensive cementation in calcareous turbidite as in 'Scaglia Calcaiere' decrease the porosity and cause major problem in such reservoir (Duvernoy & Reulet, 1982).

Magmatic arc in Indonesia is dominated by feldspar minerals and weathering processes on land change the feldspars to become clay minerals. After the sediments were transported to the sea, to form the turbidite fan of Halang Formation (North Serayu Basin, Java) the clay minerals filled in the pores. High tectonic compression in the region made the sandstones compact and the ductile feldspars, which are 50-75% of the composition, decreased the pore sizes.

2.2 Grain Size and Shape

The grain size of turbidite deposits may be related to channel dimension and may together with bed thickness, decrease upward. A large range of grain size variation is common in turbidite sandstones. Massive sandstones in the Wilmington field ranged from fine to medium size and here poorly to moderately sorted. The graded sandstone contains fine to medium grains with rounded pebbles and shale clast up to 20 mm in diameter in the bottom part.

In the Inglewood field, massive sandstones are very poor to poorly sorted. Maximum grain size is 4 mm in diameter (granule) with dominant fine grained sandstone and up to 3 ft. thick. All samples taken from cores contain dominantly angular to subangular grains (Schweller, 1988).

The sandstone reservoir in the Forties Field is dominated by fine to medium grained and moderately sorted sandstone (Wills, 1991). Bed thickness ranges from 0.75-2.50 m. Granule and cobble size clasts are common.

2.3. Mineral Orientation and Packing

Other factors such as mineral orientation and packing also control the porosity and permeability. Platy mineral occurrence in sandstone, such as mica, are normally deposited in a relatively horizontal position and form a barrier of vertical fluid flow. Related cases were found in the Frigg Field and the Wilmington Field.

The packing control volumes of pore spaces and size of the pores and hence significantly alters both porosity and permeability (Pettijohn, 1975). Close packing is common in turbidite sandstone which reduces the reservoir quality. In the Wilmington Field, the lower permeability values of the fine-grained, thin bedded sand is thought to be due to a greater number of grain contacts and smaller pores in this sand than in the medium grained, thick-bedded sand.

3. Partition and Conduits

An increasing share of the world's oil and gas reserves is being found in deep water fans that contain an accumulation of turbidite deposits. These fans occur in two major areas: of mountainous coastal, tectonically active areas with steep slopes and of major deltas with gentler but unstable slopes. They may also occur in lakes such as Lake Geneva. Most submarine fans are believed to be derived from sediments and debris laid down at or near an increase of slope. These sediments are unstable dense masses that flow down the basin slope and along the ocean floors in turbidity currents that cut gullies and channels into existing deposits and subsequently fan out on the gently sloping basin floor. Later, as currents in the basin return to the normal slow fallout of finer particles, increasing amounts of clay are laid down over the turbidites to seal the deposit.

Lateral continuity of the individual turbidite beds or channels deposited during a single cycle may range from a few hundred to thousands of feet along the channels and hundreds of feet across their widths. Vertical continuity between beds on a fan is usually extremely poor because of the lenticular geometry of the sands and the continuity of the intervening silt/clay beds. The vertical continuity may be good between beds if the overlying channels cut into the lower beds during deposition (Richardson et al., 1987). The beds thin across the width of a lobe and become shalier and less permeable toward their lateral and distal edges. Thus a given lobe may or may not communicate laterally with another lobe at a similar depth unless the later pulse of

Ke hal. 8

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sediments cut into the first lobe laid down (Fig.1.).

The complexity of the turbiditic reservoir has been a major factor in limiting the commerciality of the reservoir due to low mobile-oil recovery efficiencies. Syndepositional faults which are common in submarine fan deposits increases the complexity and controls the fluid flow (Parsley, 1990). Siltstone and shales which occur within the turbidite system often act as a fluid barrier.

Hydrocarbon recovery from channel fill turbidite reservoir in Yowlumme Field (California) shows the impact of heterogeneity. This sandstone reservoir is composed of lenticular flow units that are narrow but elongated parallel to the channel trend. In terms of fluid production, the flow units are individual thin beds that are bounded by low permeability shale. Dips recorded by well logs reflect the attitudes of thin shales between flow units, and groups of flow units form submembers characterized by distinct dipmeter patterns in which dips are inclined in a cross-channel direction (Fig..). Because of the layered and lensing nature of the reservoir, secondary recovery of oil cannot be entirely effective with existing wells. In-fill drilling will be required to drain the reservoir more completely (Berg & Royo, 1990),

4. Conclusion

Some aspects such as sandstone characteristics, size of the basin, tectonic activity, control the quality of the turbiditic reservoir. However, in contrast with the large volumes of oil-in-place, turbidite reservoirs generally show a very complex reservoir architecture. The case in Texas shows that recovery strategies in these depositional fans are clearly needed. Therefore hydrocarbon production from turbidite reservoirs is likely to benefit from more detailed knowledge of bed continuity. interconnectedness and permeability distribution.

Other oil and gas accumulations in submarine valley and fan deposits may in the future be found far out to sea underlying the upper slope of a continental rise. As pointed out by Beck & Lehnor (1974), technology advances in deep sea drilling are bringing these geologically attractive regions within the realm exploration.

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STRATIGRAFI DAN EVOLUSI TEKTONIK PULAU TANAHJAMPEA DAN SEKITARNYA, KABUPATEN SELAYAR, SULAWESI SELATAN

Oleh;

Agus Guntoro

Fakultas Teknologi Mineral, Jurusan Teknik Geologi

Universitas Trisakti

PENDAHULUAN

Pulau Tanahjampea, dengan luas sekitar 150 km^2, adalah salah satu dari rangkaian Kepulauan Laut Flores (Gambar 1), dan secara geografi terletak diantara Sulawesi Selatan dan Pulau Flores. Pulau Tanahjampea dibatasi oleh 120^{0}33' - 120^0 46' BT dan 7^0 - 7^0 8' LS., dan dicirikan oleh perbukitan bergelombang yang terjal - sedang. Ketinggian berkisar dari 0 - 500 m di atas permukaan Laut. Bukit tertinggi terletak di tengah pulau dengan ketinggian sekitar 520 m.

Laporan geologi tentang Tanahjampea dan sekitarnya dilaporkan pertama kali oleh Hetzel (1930), yang kemudian hasilnya disimpulkan oleh van-Bemmelen (1949). Hasil dari penyelidikan tersebut menunjukan adanya persamaan dari batuan-batuan granit yang ada di Tanahjampea dengan apa yang ada di Flores walaupun umur dari batuan tersebut tidak dapat dipastikan. Penyelidikan selanjutnya dilakukan oleh Team Geologi dari Pusat Pengembangan dan Penelitian Geologi (P3G) Bandung. Hasil dari penelitian tersebut telah dipublikasikan dalam bentuk Lembaran Peta Geologi Lembar Bonerate.

Penyelidikan geologi di Pulau tersebut dan sekitarnya dilaksanakan pada bulan Juni - July 1993 sebagai bagian dari pemetaan geologi dan gaya berat di Kepulauan Laut Flores yang merupakan projek penelitian dari studi S3 di University of London.

Tulisan ini membahas batuan sedimen yang terdapat di Pulau Tanahjampea dan proses-proses tektonik di daerah tersebut.

Ke hal 12