

## **Fluid Production Characteristics of Tight-Gas Sandstone Reservoirs, Wyoming, Colorado, and Utah**

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Gas, oil, and water production data were compiled for selected wells in 23 tight-gas sandstone reservoirs in Wyoming, Colorado, and Utah. The production from each well is represented by two samples spaced five years apart, with the first sample typically taken two years after production began. For each field, diagrams of oil versus gas and water versus gas show fluid production rates, the water-gas and oil-gas ratios, and the change in water and gas production over five years.

The amount of oil (condensate) produced with gas varies from dry gas (gas without oil) in 5 fields, to wet gas with median values ranging from 3 to 10 barrels of oil per million cubic feet of gas (bo/mmcf) in 12 fields, to wet gas with median values around 20 bo/mmcf in four fields. In addition, one field has the characteristic of a retrograde gas reservoir, and one field has the characteristic of an oil reservoir. Free water is produced from most, but not all, of the fields that we examined. Two fields had no water produced from any of the wells and a few fields had some wells with no water production. In other fields, the water-gas ratio varied from 2 times to more than 1,000 times greater than what could be dissolved in gas in the reservoir.

Gas production at the second sample in individual wells, taken after 7 years of production, ranges from 10 to 100 percent of the first-sample value, after two years of production. Despite the scatter in individual wells, the median decline of gas over the five year span is between 40 and 60 percent for many of the fields. The change in water production is more erratic than the decline in gas production, as water production can either decrease or increase with time, and with one exception (Pinedale field), the change in water production is poorly correlated with gas decline. An important conclusion that can be made from the water-gas ratio plots is that water production with time is unpredictable, both from well to well within a field and also from field to field.