Unconventional Gas Production from Thin Coal Seams

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Abstract: The need for enhanced natural gas production is made evident by the increasingly large percentage of the electrical power that is produced from this source (at present 25%). While this resource can be extracted from a number of sources, many of the new fields have a high decline rate, and thus increasingly unconventional sources must be developed. One such source is the natural gas found within coal beds. This Coal Bed Methane (CBM) provides only a limited reserve if the wells sunk down to the coal are drilled completely vertically, since production is a function of the length of the well that is exposed to the producing formation, since the seams of coal are often relatively thin.

Where horizontal wells are drilled along the coal seam, and providing that the drill remains in the coal during the entire length of the well, much higher production levels can be achieved.

Missouri S&T, in collaboration with Sandia National Laboratory, pioneered the use of high pressure water-jets for drilling such holes, and collaborated with the University of Queensland in demonstrating that wells could be drilled out to at least a kilometer in distance. Such wells also provide a path for the subsequent injection of steam and air with controlling bounding of the site, to allow the in-situ combustion of those shallow coal seams that are too thin to be mined conventionally. The producer gas generated by drilling two horizontal wells adjacent to one another (one for injection and one for extraction) can then be utilized in a surface power plant, without the environmental costs of conventional mining.

Acknowledgments

- Dr. Clark Barker Of MS&T initial design
- Sandia National Laboratory for support and assistance
- RMERC staff for field support and system construction
- U.S. Department of Energy for program support