AAPG Datapages/Search and Discovery Article #90213 CSPG© 2015 CSPG/CSEG/CWLS Convention 2004, Innovation, Collaboration, Exploration: Building to the Future, Calgary, AB, Canada, May 31-June 4, 2004

Critical Data Requirements for Coal Gas Reservoir Resource Assessment

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ABSTRACT

The science of (sorbed) coal gas reservoir resource assessment continues to evolve. Consequently, there are no accepted standard data requirements for assessing these reservoirs. Inaccurate or insufficient data will not permit the determination of reservoir permeability, in-situ gas content, gas-in-place volume, gas storage capacity, reservoir saturation, and critical production pressure. A suite of data requirements specifically designed for the coal gas industry was developed to address this problem. These critical data requirements include: reservoir pressure and temperature; desorbed gas content and composition; reservoir sample lithology and photography; inherent moisture, residual moisture, ash, total sulphur content; helium (grain) density, proximate, and ultimate characterization; petrographic characterization; thermal maturity determination; gas storage capacity; and permeability determination. Integrated interpretation of these data allows the conversion of gas sorption data to different mass bases (i.e., in-situ; dry, ash-free; dry; mineral-matter-free, etc.), the establishment of relationships between gas sorption, sample composition, and density for quality assurance/quality control measures, and most importantly, the proper assessment of gas storage and recovery, bulk rock characterization, and gas-in-place volumes present in the reservoir system. Given the vital significance of decisions operators must make, the added cost associated with adopting and adhering to these critical data requirements is minor compared to the potential economic consequences of basing decisions on insufficient and unreliable data.