Productivity Enhancement: Pretreatment of Coal Seams for Removal of Coal Fines from CBM Wells During Hydro Fracturing

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Coal is a prolific source of methane, a natural gas, found in most coal deposits popularly known as coal bed methane (CBM). India has sixth largest coal reserves in the world and estimated to be at 206 billion tons and it ranks 10th in CBM resources, found at depth from 300 to 1300 m. The CBM reservoir is having 0.5 % average porosity and 0.5-5 md average permeability with more than 90 % gas saturation. Its reservoir temperature varies between 35-70°C and pressure varies between 800-1300 psi with average closure stress of 1400 psi. As of now 17 numbers of wells were drilled Jharia, Bokaro & North Karanpura and 25 are planned to be drilled in Upper pack, Middle pack and Lower pack of Barakar coal formation.

As porosity and permeability is very less in CBM reservoir, therefore, over 50 no of hydro fracturing job have been done so far to exploit the methane gas by reducing the pressure below critical saturation pressure through dewatering. In some fracturing job, fines migration with unbroken gel problem has been observed due to large fine and debris generation during the hydro-fracturing job due to fragile nature of coal.

As the coal fines are hydrophobic in nature that tries to settle down into the fracture that leads to screen out consequently desired length is not achieved and These coal fines & particulate does not come out during the flow back from the proppant and reduces the conductivity of the fracture. For fine mitigation during hydro fracturing, pre treatment of coal seam is suggested with innovative chemical formulations that will be able to mitigate the coal fines problem during hydro fracturing. This method increase the fracture length by 1.5 fold fracture length so the production of HC than the conventional method and help in enhancing the overall performance and enhance the HC production.