

**Overview of Gas Hydrate Research at the Mallik Field
in the Mackenzie Delta, Northwest Territories, Canada**

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Abstract

The Mallik gas hydrate field, located at the northeastern edge of Canada's Mackenzie Delta, occurs within a sequence of Tertiary sediments in an area underlain by over 600m of permafrost. With data available from the original discovery well in 1971/72, and a scientific research well program in 1998, gas hydrate occurrences have been well documented. Quantitative well log determinations and core studies reveal at least 10 discrete gas hydrate layers from 890 m to 1106 m depth, exceeding 110 m in total thickness. High gas hydrate saturation values, which in some cases exceed 80% of the pore volume, establish the Mallik gas hydrate field as one of the most concentrated gas hydrate reservoirs in the world. Beginning in December 2001 and continuing to March 2002, a production research well program was completed that include drilling of a 1200 m deep main production research well and two nearby science observation wells. The research program represents a collaboration between the Geological Survey of Canada, the Japan National Oil Corporation, GeoForschungsZentrum Potsdam, the U.S. Geological Survey, the U.S. Department of Energy and the Gas Authority of India Ltd/Oil and Natural Gas Corporation Ltd. The Geological Survey of Canada is

coordinating the science program for the project and JAPEX Canada Ltd is the designated operator for the fieldwork.

Primary objectives of the Mallik 2002 production research well program are to advance fundamental geological, geophysical and geochemical studies of the Mallik gas hydrate field and to undertake advanced production testing of a concentrated gas hydrate reservoir. Full-scale field experiments will monitor the physical behavior of the hydrate deposits in response to depressurization and thermal stimulation. The observation wells will facilitate cross-hole tomography experiments (before and after production testing) as well as long term monitoring of in situ formation conditions. A wide ranging science and engineering research program will include collection of gas-hydrate-bearing core samples and downhole geophysical logging. Laboratory and modeling studies undertaken during the field program, and subsequently as part of a post-field research program will document the sedimentology, physical/petrophysical properties, geochemistry, geophysics, reservoir characteristics and production behavior of the Mallik gas hydrate accumulation.