Oil & Natural Gas Technology

DOE Award No.: DE-FC26-06NT42962

Quarterly Progress Report
(April - June 2007)

Characterization and Quantification of the Methane Hydrate Resource Potential Associated with the Barrow Gas Fields

Submitted by:
Petrotechnical Resources of Alaska, LLC
3601 C. Street, Suite 822
Anchorage, AK 99503

Prepared for:
United States Department of Energy
National Energy Technology Laboratory

July 31, 2007

Office of Fossil Energy

THIRD QUARTERLY PROGRESS REPORT

APRIL – JUNE 2007

CHARACTERIZATION AND QUANTIFICATION OF THE METHANE HYDRATE RESOURCE POTENTIAL ASSOCIATED WITH THE BARROW GAS FIELDS

DOE Project Number: DE-FC26-06NT42962

Awarded to

North Slope Borough, Alaska

Project Director/Manager: Kent Grinage

Principal Investigator: Thomas P. Walsh

Prepared by

Thomas P. Walsh
Peter J. Stokes, P.E.
Petrotechnical Resources of Alaska, LLC
3601 C. Street, Suite 822
Anchorage, AK 99503

Prepared for:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochrane Mills Road
P.O. Box 10940
Pittsburgh, PA 15236-0940

DISCLAIMER

EXECUTIVE SUMMARY

Phase 1A of the Characterization and Quantification of the Methane Hydrate Resource Potential Associated with the Barrow Gas Fields Project (Project) was completed in this third quarter of project activity, with completion of Task 4, submission of the Phase 1A final report.

The deliverables of Phase 1A include: completion of a technology status assessment; development of a research management plan; compilation of a comprehensive database of previously acquired temperature and pressure gradient information and reservoir fluid and gas sample analysis; sampling and analysis of produced gas from the three fields; modeling the hydrate stability zone associated with the three Barrow Gas Fields; and documentation of final results in a final Phase 1A technical report.

Project review meetings were held in Barrow and Fairbanks, Alaska on June 7-8 with participation of the North Slope Borough (NSB), DOE/NETL, Petrotechnical Resources of Alaska (PRA), and University of Alaska Fairbanks (UAF). Phase 1A results and justification for Phase 1B were discussed, and recommendations for updates to the RMP were proposed.

A draft of the Phase 1A Final Technical Report was delivered to the six members of the project technical advisory group (TAG), along with a solicitation of their comments on the merit of proceeding to Phase 1B, and responses were received from five of the TAG members. The responses were very supportive of proceeding to Phase 1B, and valuable comments were received regarding proposed changes to the RMP for Phase 1B.

SUMMARY OF PROJECT

The North Slope Borough (NSB) has established a team to characterize and quantify the methane hydrate resource potential associated with the Barrow Gas Fields (BGF), which are owned and operated by the NSB in a permafrost region of arctic Alaska. Currently, gas from these three producing fields provides heating and electricity for Barrow, which is the economic, transportation, and administrative center of the NSB. Other commercially-operated producing oil and gas fields within the NSB include Prudhoe Bay, Milne Point, Kuparuk, Alpine and Endicott. The results of this project will enhance the understanding of the nature and occurrence of methane hydrates in the arctic environment, and specifically in the Barrow Gas Fields, and will

server to evaluate the potential influence of gas hydrates on gas supply and production from producing gas fields. Findings of this project will contribute significantly to understanding the role of gas hydrate as a recharge mechanism in a producing gas field, and provide substantial commercial and social benefits for the NSB.

The characterization and quantification of methane hydrate resources in the Barrow Gas Fields (BGF) will be completed in three phases: IA, IB, and II. This approach will allow for timely evaluation and adjustment of methods and objectives as new findings are obtained. The Research Management Plan (RMP) lays the framework for all three phases; however, it will be updated before commencement of Phase II, if warranted, which will be funded in the future.

Phase 1A will determine whether the methane hydrate stability zone exists up-dip of one or more of the BGF, validating the postulate that the gas fields in question are potentially being recharged by dissociation of adjacent methane hydrates. If the results are positive, then funding will be released for Phase 1B.

In Phase 1B, the NSB will a) determine probability that the reservoir is continuous up-dip into the methane hydrate stability zone, and contained sufficient water to combine with available gas to form gas hydrate; b) determine the optimum well location for a dedicated methane hydrate well; and c) quantify reserves, expected production rates and depletion mechanisms for methane hydrate production.

The Project has been funded for $152,465 for Phase 1A to accomplish the following four tasks:

Task 1 — Develop Research Management Plan
Task 2 — Complete Technology Status Assessment
Task 3 — Develop a methane hydrate stability model
Task 4 — Prepare Phase IA Final Technical Report

The results of Phase 1A will determine whether or not funding will be requested for Phase 1B.

PROJECT TASKS COMPLETED THIS QUARTER

TASK 4: Phase 1A Final Technical Report

The final technical report was completed, documenting all Phase 1A project activities and findings. The recommendation to proceed to Phase 1B is presented in the final report. The report is posted on the DOE/NETL website:

http://www.netl.doe.gov/technologies/oil-gas/publications/Hydrates/reports/MH42962_FinalRptPhase1A.pdf

TECHNOLOGY TRANSFER

- Tom Walsh and Pete Stokes of PRA updated an article on the project for publication in DOE/NETL Spring/Summer 2007 “Fire in Ice” publication, with much-appreciated

editing support from Karl Lang and Robert Vagnetti. The article documents the findings of Phase 1A.

http://www.netl.doe.gov/technologies/oil-gas/publications/Hydrates/Newsletter/HMNewsSpringSummer07optmiized.pdf

CONCLUSION

Phase 1A was completed in this third quarter, with submission of the Phase 1A Final Technical Report, including a recommendation to proceed to Phase 1B. A draft of the final technical report was delivered to the project technical advisory group (TAG), and their input was solicited regarding the merit of proceeding to Phase 1B, as well as comments on possible revision of the project RMP. Responses were received from five of the six TAG members, and all of the responses were supportive of moving to Phase 1B. Feedback on modification of the RMP was included in several of the responses, and these comments will be incorporated in a new initial task of Phase 1B focused on revising the RMP.

National Energy Technology Laboratory

626 Cochrans Mill Road
P.O. Box 10940
Pittsburgh, PA 15236-0940

3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507-0880

One West Third Street, Suite 1400
Tulsa, OK 74103-3519

1450 Queen Avenue SW
Albany, OR 97321-2198

2175 University Ave. South
Suite 201
Fairbanks, AK 99709

Visit the NETL website at:
www.netl.doe.gov

Customer Service:
1-800-553-7681