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THE UTILIZATION OF THE MICROFLORA INDIGENOUS TO AND PRESENT IN OIL-BEARING FORMATIONS TO SELECTIVELY PLUG THE MORE POROUS ZONES THEREBY INCREASING OIL RECOVERY DURING WATERFLOODING

Quarterly Technical Progress Report
July 1, 1998-September 30, 1998

By
James O. Stephens
Lewis R. Brown
Alex A. Vadie

Report Issue Date: October 20, 1998

Performed Under Contract No. DE-FC22-94BC14962

Hughes Eastern Corporation
Ridgeland, Mississippi

DISCLAIMER

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November 1999

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Prepared for
U.S. Department of Energy
Assistant Secretary for Fossil Energy

Gary Walker, Project Manager
National Petroleum Technology Office
P.O. Box 3628
Tulsa, OK 74101

Prepared by
Hughes Eastern Corporation
403 Towne Center Blvd., Suite 103
Ridgeland, MS 39157

NINETEENTH QUARTERLY PROGRESS REPORT

TITLE:

THE UTILIZATION OF THE MICROFLORA INDIGENOUS TO AND PRESENT IN OIL-BEARING FORMATIONS TO SELECTIVELY PLUG THE MORE POROUS ZONES THEREBY INCREASING OIL RECOVERY DURING WATERFLOODING

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RECIPIENT:
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403 Towne Center Boulevard Suite 103
Ridgeland, MS 39157

DATE OF REPORT:
October 20, 1998

AWARD DATE:
January 1, 1994

ANTICIPATED COMPLETION DATE:
June 30, 1999

GOVERNMENT AWARD:
$286,168 (Current Year DOE Share)

PROGRAM MANAGER:
James O. Stephens
Hughes Eastern Corporation

PRINCIPAL INVESTIGATORS:
Lewis R. Brown
Mississippi State University

Alex A. Vadie
Mississippi State University

CONTRACTING OFFICER'S REPRESENTATIVE:
Martin J. Byrnes (412) 892-4486
U.S. Department of Energy
Federal Energy Technology Center
P.O. Box 10940 MS 921-118
Pittsburgh, PA 15236-0940

DOE PROJECT OFFICER:
Gary Walker
U.S. Department of Energy
N.P.T.O.
P.O. Box 3628
Tulsa, OK 74101

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July 1, 1998 - September 30, 1998

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NINETEENTH QUARTERLY PROGRESS REPORT

OBJECTIVE

The objective of this work is to demonstrate the use of indigenous microbes as a method of profile control in waterfloods. It is expected that as the microbial population is induced to increase, that the expanded biomass will selectively block the more permeable zones of the reservoir thereby forcing injection water to flow through the less permeable zones which will result in improved sweep efficiency.

This increase in microbial population will be accomplished by injecting a nutrient solution into four injectors. Four other injectors will act as control wells. During Phase I, two wells will be cored through the zone of interest. The core will be subjected to special core analyses in order to arrive at the optimum nutrient formulation. During Phase II, nutrient injection will begin, the results monitored, and adjustments to the nutrient composition made, if necessary. Phase II also will include the drilling of three wells for post-mortem core analysis. Phase III will focus on technology transfer of the results. It should be pointed out that one expected outcome of this new technology will be a prolongation of economical waterflooding operations, i.e. economical oil recovery should continue for much longer periods in the producing wells subjected to this selective plugging technique. Results from work under DOE Contract No. DE-AC22-90BC14665 will be incorporated as appropriate.

SUMMARY OF TECHNICAL PROGRESS

Phase I. Planning and Analysis (9 months)

All work in Phase I has been successfully completed.

Phase II. Implementation (45 months)

All work in Phase II has been successfully completed.

Phase III. Technology Transfer (12 months)

This is the first quarter of the technology transfer phase of the project.

During this quarter the following activities were carried out.

- A presentation has been scheduled and prepared for the 1998 Annual Meeting of the Southern Great Lakes Local Section of the Society for Industrial Microbiology to be held in Kalamazoo, MI on October 10, 1998 by L.R. Brown. Topic: Microbial Enhanced Oil Recovery.
- A presentation has been scheduled and prepared for the Los Angeles Basin SPE Section New Technology And Environmental Forum to be held on October 21, 1998 by L. R. Brown on the topic "The Hughes Eastern Corporation/DOE Microbial Project." A. A. Vadie will participate in the discussion phase of the program.
- A presentation to the Society of Petroleum Engineers Rocky Mountain Regional Meeting has been scheduled for May 1999. Topic: "The Anatomy of a Microbial Oil Recovery Project" to be presented by J.O. Stephens, L. R. Brown and A. A. Vadie.
- An article on the Hughes Eastern Corporation - MSU-DOE project will appear in the November 1998 issue of Core, a publication of the Water Resources Research Institute.

- A Petroleum Technology Transfer Council workshop has been scheduled for November 4, 1998 in Jackson, MS and preparations are being made. Dr. Lewis R. Brown, Dr. Alex Vadie and James O. Stephens will each make presentations about the MEOR project in North Blowhorn Creek Unit.

- So far 34 letters offering presentations, group sessions, and/or workshop presentations were sent to major and independent oil companies.

- E-mail, fax, and telephone communication have been made with a number of oil companies in response to their requests for information about MEOR in general and our project in particular.