DOE/EE/15659--73

NEW TECHNOLOGY FOR SULFIDE REDUCTION AND INCREASED OIL RECOVERY

THIRD QUARTER PROGRESS REPORT

March 20, 1998

Project work was initiated by Geo-Microbial Technologies, Inc. (GMT), Ochelata, Oklahoma for Contract Number DE-FG01-97EE15659 on June 18, 1997. The purpose of this project is to demonstrate reduction of sulfide contamination, as well as possible improvement of production in oil and gas production systems. This will be accomplished by application of the BioCompetitive Exclusion (BCX) process developed by GMT. A broad spectrum of well types and geographical locations is anticipated.

The BCX process is designed to manipulate indigenous reservoir bacteria with the addition of synergistic inorganic chemical formulae. These treatments will stimulate growth of beneficial microbes, while suppressing metabolic activity of sulfate reducing bacteria (SRB), the primary source of harmful sulfide production.

Third Quarter Progress

To date, the following projects have been initiated, completed or nearing completion:

West Texas - 10 production wells; weekly treatments for reduction of H₂S and FeS, and possible increase in oil and/or gas production. This project has now been completed and data is being compiled and interpreted for the final report.

Wyoming - 1 production well project to demonstrate the effect of large monthly treatments on H₂S/FeS and production. This project is scheduled to end March 31, 1998. Excellent data has been accumulated and will be submitted in the final report.

Northwest Kansas - To demonstrate the effect on injection pressure by periodically treating an injection well. This project is complete and is showing a beneficial improvement in injection pressure. Graph will be presented in the final report.

Southwest Kansas - To demonstrate the effect of weekly treatments on 6 gas wells for the purpose of reducing H₂S. This project was initiated in June, 1997, and is continuing. Excellent data accumulation to be presented in the

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

MASTER

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible electronic image products. Images are produced from the best available original document.

final report. Results are guiding us to try other treatment methodologies in order to achieve even better results.

Northeast Oklahoma - Periodic treatments of a waterflood injection well to demonstrate the effect on oil production from 4 production wells that are influenced by the injector.

This project demonstrated increased oil production from two separate treatments, with supporting water analysis data. Presented in final report.

North Central Oklahoma - Weekly treatment of 1 production well for reduction of H₂S/FeS. Successful treatment of this well; data presented in final report.

California - Multiple treatment strategies on 6 production wells to reduce H₂S/FeS and possibly affect oil and/or gas production. As of March, 1998, this project is showing sporadic, yet reduced levels of H₂S. Operator is amenable to introducing the treatments on the injection side of the waterflood in order to sweeten the reservoir and possibly increase oil production. All data to be presented in the final report.

The SW Kansas and California projects will continue at GMT's expense in order to perfect our treatment system and results. These and the other projects have yielded a wealth of data to support the effectiveness of the BCX process.

All field data, both pre-treatment baseline and post-treatment monitoring have been and continue to be recorded and evaluated by GMT. Graphical representation of data indicates the need for any adjustments in treatment protocol and the relative success of the treatment process. These graphs will be presented in the Final Report.

Laboratory work, field sampling and treatments, and monitoring have intensified throughout each project, and will enable us to evaluate the effectiveness of the BCX process in a variety of field environments.

Technology Transfer Activities

GMT's Director of Field Operations, Mike Dennis, attended the 8th Annual Produced Water Seminar in League City, Texas, January 15 - 16, 1998. Plans were finalized for presenting an exhibit booth for the Society of Petroleum Engineer's/U.S. Department of Energy 11th Symposium on Improved Oil Recovery, in Tulsa, Oklahoma April 19 - 22. Discussions and meetings in Houston and Ochelata have been held with several national oil field service organizations for the purposes of initiating a new business venture to market the BCX technologies.