BDM SUBCONTRACT FACT SHEET

CONTRACT TITLE: Fundamental Geoscience Research and Development

ID NUMBER: G4S51728

Related WA #: 95-A01

CONTRACT PERFORMANCE PERIOD

03/29/1996 to 03/26/1998

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FUNDING (1000's)	BDM SHARE	OTHER SHARE	TOTAL
PRIOR FISCAL YRS	483	345	828
FISCAL YR 1998	260	0	260
FUTURE FUNDS	0	0	0
TOTAL EST'D FUNDS	743	345	1,088

PROJECT DESCRIPTION:

The fundamental basis of this project is the concept of discrete fracture network modeling. In the discrete fracture network modeling approach, the fractured reservoir is realistically depicted by a network of discrete features representing fractures, combined with a background permeability. The discrete fracture network approach provides unique abilities to evaluate the pressures, flows, and connectivities of fractured oil reservoirs.

Accomplishments:

3D Hierarchical Fracture Model: The HFM Model facilitates the generation of 3D DFN simulations constrained by geological and tectonic information. The HFM model can model geologic structures involving spatially variable fracturing, correlations between fractures and major structures.

Thermally Assisted Gravity Segregation: The project developed tools for modeling the innovative TAGS process for tertiary oil recovery, and provided TAGS results for the open literature.

Fracture Data Analysis: The project developed innovative tools for quantitative analysis of orientation, flow dimension, and spatial structure based on neural network, graph theory, and correlation analysis.

Compartmentalization Analysis: The fractured reservoir compartmentalization analyses developed as part of this project utilizes graph theory to understand discrete feature network connectivity.

Tributary Volume Analysis: When the primary path for oil delivery to the well completion is the fracture network, the volume of oil producible from a given completion depends on the geometry of the connected fracture network. The "tributary drainage volume" analysis was developed as part of this project.

Block Size Analysis: The multi-directional spacing algorithm (MDS) provides a direct method to calculate block size and shape parameters which are an essential element of dual porosity reservoir simulators such as ECLipse. MDS calculates the block size and shape distribution, the o-factor and the vertical height of matrix blocks.

Flow Dimension Analysis: Flow dimension analysis of pressure time-histories was developed for hydrogeological applications. This project developed innovative applications of flow dimension analysis to support connectivity analysis for fractured reservoirs.

Practical DFN Analysis for Tertiary Oil Recovery: The project developed and demonstrated the DFN approach for design of tertiary oil recovery.