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**ENHANCEMENT OF EXISTING GEOTHERMAL RESOURCE UTILIZATION BY
CASCADING TO INTENSIVE AQUACULTURE**

QUARTERLY REPORT

PERIOD JULY THRU SEPTEMBER 1993

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**Work Performed Under Contract DE-FC07-93ID13203
For
U. S. Department of Energy
Office of Industrial Technologies
Washington, D.C.**

**By
Southwest Technology Development Institute
Las Cruces, NM 88003-0001**

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QUARTERLY PROGRESS REPORT
Period Covering 6/1/93-9/30/93

1. Project Title: Enhancement of Existing Geothermal Resource Utilization by Cascading to Intensive Aquaculture

2. DOE Contract Number: DE-FC07-93ID13203

3. Organization:

Southwest Technology Development Institute
P.O. Box 300001/Dept 3SOL
New Mexico State University
Las Cruces, New Mexico 88003-0001

4. Investigators:

Dr. Walter H. Zachritz II
Dr. Rudi Schoenmackers
Mr. Ronald Polka

5. Activities/Results/Milestones in the quarter:

The basic design elements for the greenhouse structure, geothermal storage pond, high rate nitrification artificial wetlands (AWF) filter unit, denitrification (AWF) filter unit, control building, and parking areas are complete. The 30 x 96 foot greenhouse enclosure is complete except for final wiring and installation of the glazing material. These elements will be completed when the final piping for culture units is completed. The storage pond and the AWF units were excavated and the liners and fittings were installed. The rock media for the nitrification AWF has been installed (see enclosed photos) and we are awaiting the delivery of the rock for the denitrification unit. We are awaiting the pump basins for the AWF to complete the plumbing on these units. Work on the piping for the culture tanks and related systems has started and major drain lines for the units have been installed. Pumps, piping, and fittings have all been ordered and are awaiting installation. The control building was constructed using geothermal in-floor coils for winter heating demand and is awaiting finish work to the interior.

6. If appropriate, identify any difficulties encountered and remedial actions taken:

Some minor shipping and purchasing delays have been experienced. But no major delays are anticipated at this time and the project is on time and on schedule.

7. Description of next quarter's anticipated activities:

Final design configurations for the piping and tanks will be completed. Installation of the tanks and related piping and pumps will commence. When appropriate, the work will continue on the installation of the greenhouse structure and glazing.

**DATE
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END