

RESEARCH

THE GEOTHERMAL PROGRAM of New Mexico Energy Institute, New Mexico State University — NMEI-NMSU

The work of NMEI-NMSU has made New Mexico a regional standard-bearer in the effort to tap underground heat as an energy source. Its geothermal team heads a multi-state program sponsored by the federal government to map the distribution of subterranean hot spots throughout the Rocky Mountain West. It supports a wide range of projects to determine the accessibility of thermal reservoirs and the best ways to use them.

NMEI-NMSU scientists are seeking to make controlled fractures in beds of hot dry rock. This will enable them to increase the area of heat transfer zones through which water may be circulated and returned to the earth's surface as steam to drive turbines. Other researchers are using the techniques of computer modeling to predict how different methods of exploitation could affect geothermal behavior at sites along the Rio Grande Valley and in neighboring mountain ranges.

A number of highly important investigations are opening the way to better understanding of the environmental issues connected with tapping heat from inside the earth. This research has helped pinpoint the areas most capable of producing significant amounts of power while maintaining the quality of life in New Mexico at the highest possible level.

In 1978, NMEI-NMSU's geothermal program branched out in some promising new directions to complement its work in high temperature reservoir assessment for electrical power production. The institute is now compiling an inventory of low-grade heat sources which are not only numerous but widely distributed throughout New Mexico. These pockets where temperatures hover just below the boiling point could readily meet the space and domestic hot water heating needs of some populated areas.

The summer of 1978 saw important progress in the use of underground energy with the first steps toward sinking geothermal verification wells. As researchers formulate new proposals, this should lead to demonstration projects and finally to major changes in energy use patterns both for individuals and for whole cities.

Economic and technical analyses of the implications of using geothermal energy have gone hand in hand with efforts to attract new industry. Manufacturers and public utilities are growing increasingly aware of the potential of this hitherto untapped power supply. Putting it on line as a commercial energy producer can lead to an expanded tax base and more private sector jobs for New Mexico.

THE GEOTHERMAL RESOURCE: Finding and classifying pockets of usable underground heat has added a new dimension to developing natural resource inventories.

An Investigation of the Thermal Regime of the Rio Grande Rift and Neighboring Provinces by Employing Very Deep Heat Flow Measurement and Estimates of Crustal Radioactive Heat Generation (Completed)

BEF-5 Marshall Reiter New Mexico Institute of Mining and Technology

Seismic Investigation of a Magma Layer in the Crust Beneath the Rio Grande Rift Near Socorro, New Mexico (Completed)

BEF-6 Alan Sanford New Mexico Institute of Mining and Technology

Geothermal Potential of Rio Grande Rift, New Mexico (Completed)

BEF-22 George Jiracek The University of New Mexico

Geothermal Investigations in Southwestern New Mexico (Completed)

BEF-189 Chandler Swanberg New Mexico State University

Evaluation of Geothermal Potential of the Basin and Range Province of New Mexico (Completed)

ERR 75-117 Jon Callender The University of New Mexico

Seismic Exploration for Shallow Bodies in the Vicinity of Socorro, New Mexico (Completed)

ERR 75-300 Alan Sanford New Mexico Institute of Mining and Technology

Deep Terrestrial Heat Flow Measurements in New Mexico and Neighboring Geologic Area (Completed)

ERR 76-200 Marshall Reiter New Mexico Institute of Mining and Technology

Geological Investigation of Socorro Geothermal Area (Completed)

ERB 76-201 Charles Chapin New Mexico Institute of Mining and Technology

The New Mexico Geothermal Potential (Completed)

ERB 76-210 William Stone New Mexico Institute of Mining and Technology

Regional Operations Research for Development of Geothermal Energy Resources in the Southwest United States (In Progress)

ERB 76-262 Joseph Marlin New Mexico State University

Seismic Exploration for Shallow Magma Bodies in the Vicinity of Socorro, New Mexico (In Progress)

ERB 76-263 Alan Sanford New Mexico Institute of Mining and Technology
and John Schlue

Evaluation of Geothermal Potential of the Basin and Range Province of New Mexico (Completed)

ERB 76-264 Jonathan Callender The University of New Mexico

Active and Passive Seismic Studies of Geothermal Resources in New Mexico and Investigations of Earthquake Hazards to Geothermal Development (In Progress)

ERB 77-2203 Paul Morgan New Mexico State University

Department of Energy and New Mexico Cooperative Program Low Temperature Geothermal Reservoir Assessment (In Progress)

ERB 77-2211 Robert San Martin New Mexico State University

Las Alturas Geothermal Reservoir Confirmation Study (In Progress)

ERB 77-2218 Lokesh Chaturvedi New Mexico State University

Seismic Exploration for Shallow Magma Bodies in Socorro, New Mexico (In Progress)

ERB 77-2312 Alan Sanford New Mexico Institute of Mining and Technology

Assessment of Geothermal Potential of Southwestern New Mexico (In Progress)

EMD 78-2123 Wolfgang Elston The University of New Mexico

Evaluation of the Geothermal Resource in the Albuquerque, New Mexico Area (In Progress)

EMD 78-2135 George Jiracek and The University of New Mexico
Jonathan Callender

Feasibility Study for Establishing a Centralized Geothermal Data Base for New Mexico (In Progress)

EMD 78-2219 NMEI-NMSU New Mexico State University
Project Staff

Electrical Exploration for Geothermal Resources near San Diego Mountain, New Mexico (In Progress)

EMD 78-2232 Charles Young New Mexico State University

Southwest Geothermal Regional Operations Research Study (In Progress)

EMD 78-2236 Joseph Marlin New Mexico State University

Deep Subsurface Temperature Studies in the Basins of New Mexico and Neighboring Geologic Areas (In Progress)

EMD 78-2321 Marshall Reiter New Mexico Institute of Mining and Technology

GEOTHERMAL TECHNOLOGY: Understanding the energy potential of subterranean heat involves many scientific methods and procedures.

Geothermal Gradient Measurements (Completed)

BEF-131 Marshall Reiter New Mexico Institute of Mining and Technology

Oxygen Isotope Geochemistry and Geothermal Energy Potential in New Mexico (In Progress)

BEF-166 Gary Landis The University of New Mexico

Engineering Methods for Predicting Productivity and Longevity of Hot-Dry Rock Geothermal Energy Reservoir in the Presence of Thermal Cracks (Completed)

ERB 75-107 Y. C. Hsu The University of New Mexico

An Enhanced Heat Extraction from Dry Rock Geothermal Reservoir Due to Interacting Secondary Thermal Cracks (In Progress)

ERB 77-2113 Y. C. Hsu The University of New Mexico

Development and Application of a Computer Model for Simulating a Geothermal System in New Mexico (Phase One) (In Progress)

ERB 77-2314 Pongsarl Huyakorn The University of New Mexico
and Lynn Gelhar