

A PRELIMINARY ENVIRONMENTAL ASSESSMENT
OF SELECTED GEOTHERMAL GEOTHERMAL PROJECT AREAS
IN THE SOUTHWESTERN REGION

VOLUME I
COMPARISON OF EARTHQUAKE RISK ON THE BASIS
OF POTENTIAL SEISMICITY DATA

U.S. DEPARTMENT OF ENERGY
DIVISION OF GEOTHERMAL ENERGY

Prepared for
U.S. DEPARTMENT OF ENERGY
DIVISION OF GEOTHERMAL ENERGY

October 15, 1978

STANDARD - GEOLOGICAL SURVEY
GEOLOGICAL SURVEY
UNITED STATES DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C. 20548

ABSTRACT

E. J. Newchurch

This two-volume report presents the results of a preliminary environmental assessment of the following geopressured-geothermal prospect areas in the Louisiana Gulf coast region: South Johnson's Bayou, Sweet Lake, Rockefeller Refuge, Southeast Pecan Island, Atchafalaya Bay, and Lafourche Crossing. This interdisciplinary study was sponsored by the Division of Geothermal Energy, U.S. Department of Energy, under contract No. ET-78-S-05-5762, and was conducted by the Institute for Environmental Studies, with participation by representatives of other department, at Louisiana State University.

In Volume I, these prospect areas have been compared to determine their relative environmental acceptability for the test program. Trade-offs among the prospects in terms of potential impacts are highlighted. This assessment was made on the basis of the nature and extent of the proposed testing activities in view of the environmental characteristics of each prospect area: land use, geology and geohydrology, air quality, water resources and quality, ecological systems, and natural hazards. Volume II includes a compilation of environmental baseline data for each prospect area derived from existing sources.

The comparison of prospect areas presented in this report includes consideration of worst case situations. However, we believe that the test program activities, because they are so small in scale, will not result in major adverse impacts. No prospect area, with the possible exception of Rockefeller Refuge, needs to be excluded from consideration for the test well program.

I. INTRODUCTION TO VOLUME I

E. J. Newchurch

This is the first volume of a two-volume report which presents the results of a preliminary environmental assessment of selected geopressured-geothermal prospect areas in the Louisiana Gulf Coast region. This interdisciplinary study was sponsored by the Division of Geothermal Energy, U.S. Department of Energy (DOE), under contract No. ET-78-S-05-5762, and was conducted by the Institute for Environmental Studies, with participation by representatives of other departments at Louisiana State University.

The Louisiana Gulf Coast region is known to contain a number of geopressured-geothermal aquifers which have the necessary formation capacity, geopressures, and temperatures to qualify as possible sources of geopressured-geothermal energy. This energy resource is potentially important both nationally and to the State. It could provide a welcome new source of energy to help meet the national goal of energy independence. In Louisiana, energy production from geopressured-geothermal reservoirs may help maintain the economic base that was created in large part by the availability of cheap and abundant oil and natural gas.

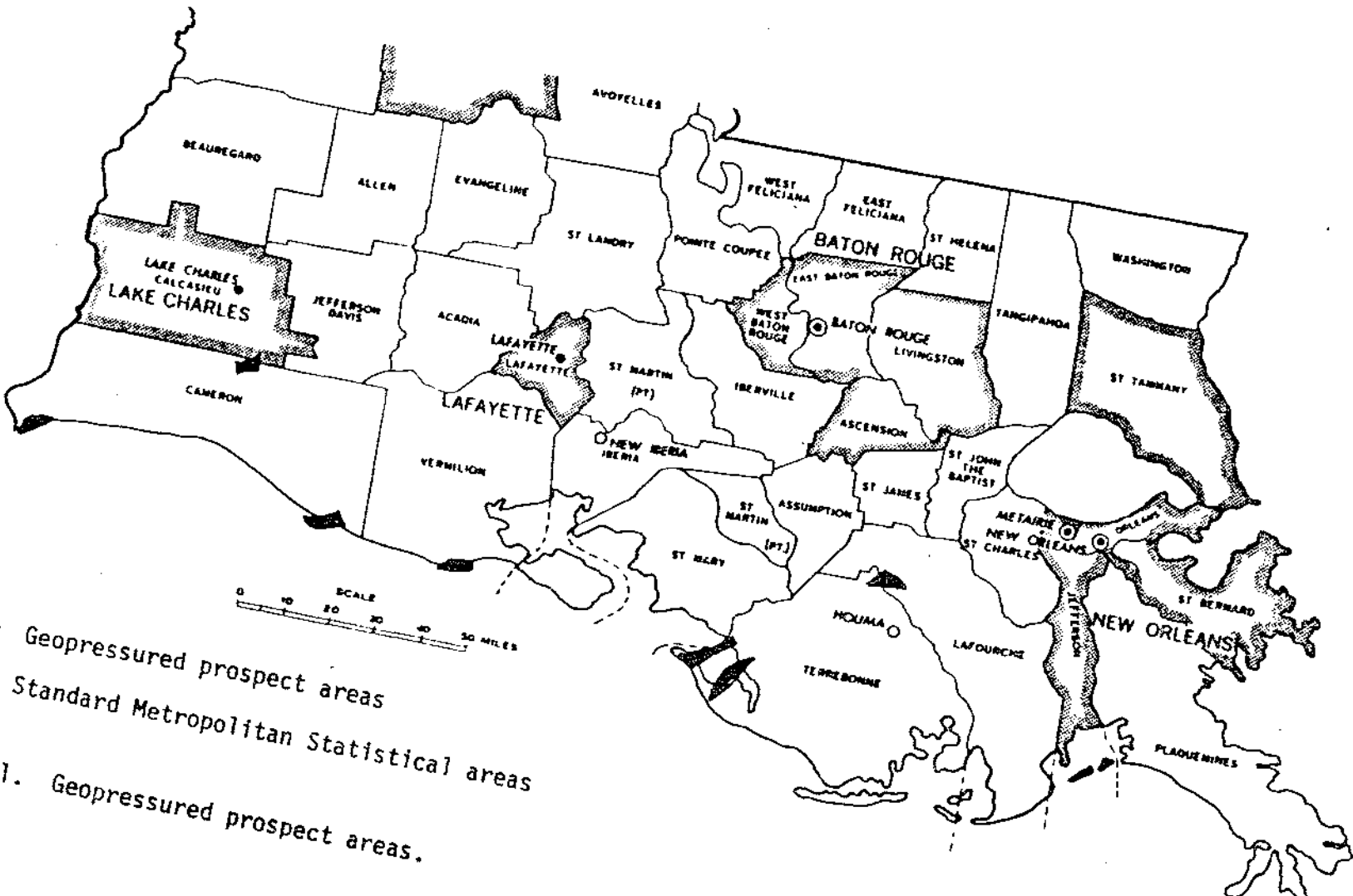
At the same time, energy production in the Gulf Coast region as elsewhere in the nation, must be compatible with environmental goals. Many of the geopressured-geothermal prospects lie within the boundaries of the Louisiana coastal zone, as defined by the State Coastal Resources Management Act of 1978. This region supports dense populations of many commercially important species and provides habitat for several rare and endangered species. In addition, some parts of the coastal zone are populated and display a wide variety of human activity. Several characteristic features of the coastal zone, such as the extremely low elevation, flooding, and natural subsidence and erosion,

serve to intensify the potential environmental impacts of geopressured-geothermal resource development.

The work described in this report was designed to provide DOE and its contractors with a preliminary environmental assessment of six prospect areas, as shown in Figure I-1, with summary data presented in Table I-1. An attempt was made to determine whether the proposed three-year reservoir program is likely to result in significant detrimental environmental effects in each prospect area. This preliminary assessment will allow DOE to make timely judgments as regards environmental concerns related to this activity.

Volume II of this report includes a compilation of environmental baseline data for each prospect area derived from existing sources. In this volume (Volume I), the prospect areas have been compared to determine their relative environmental acceptability for the test program. This assessment was made on the basis of environmental characteristics of each prospect area, and on the nature and extent of the proposed testing activities.

It is hoped that this analysis will prove of value in making overall decisions regarding geopressured energy development. The prospect of the development of this resource presents a situation in which a thorough characterization of the environment is feasible prior to any significant operations. In this way, environmental criteria can be included in the decision-making process and major problem areas can be anticipated in advance of development.



- Geopressured prospect areas
 - Standard Metropolitan Statistical areas
- 1. Geopressured prospect areas.

co

Prospect No.	Prospect Name	Parish	Area km ² (mi ²)	Top of Depth to Geopressed Zone	Off-Shore Portion	Major Ecosystem type: On-Shore Portion	Existing Oil and Gas
1	South Johnson's Bayou	Cameron	114 (44)	2,661 (8,730)	X	Coastal Marsh	X
2	Sweet Lake	Cameron	32 (20)	4,267 (14,000)		Developed-- Agriculture	
3	Rockefeller Refuge	Cameron	207 (79)	3,719 (12,200)	X	Coastal Marsh	X
4	Southeast Pecan Island	Vermilion	199 (77)	4,267 (14,000)	X	Coastal Marsh	X
5	Atchafalaya Bay	Terrebonne	267 (103)	3,353 (11,000)	X	Coastal Marsh	X
6	Lafourche Crossing	Lafourche	91 (35)	3,901 (12,800)		Developed-- Agriculture	X

Table 1-1. Candidate geopressed prospect areas: Summary data.