

IMPERIAL VALLEY'S PROPOSAL TO DEVELOP A GUIDE
FOR GEOTHERMAL DEVELOPMENT
WITHIN ITS COUNTY

David E. Pierson
Imperial County Department of Public Works
El Centro, California

The county's tool to guide its development is a so called "General Plan." The purpose of this project is to establish the geothermal element for the County's General Plan. In order to prepare such a General Plan, a considerable amount of research plus compilation and examination of existing research is required. A proposal is pending wherein Imperial County, University of California, Riverside, and California Institute of Technology would combine efforts to develop this plan. This research should show the general location in which development could occur, the economic tradeoffs of geothermal development, the sociological, geographic, land use, and environmental effects, plus geological and engineering study. When all is put together, we will know what effect geothermal development will have upon Imperial County as determined by the best available evidence at this time.

Imperial County is not only known as the nation's salad bowl but it now is becoming known as the nation's "teapot." The geothermal resource areas of the county are being explored and tested. The various techniques of harnessing the resource are now being researched in the laboratory and in the field. Both industry and the federal government are proceeding to develop a means to utilize the heat and liquids to generate electricity and to produce fresh water.

The people and the government of Imperial County look on this process with considerable interest. We need certain kinds of development, but we do need to insure compatibility with our current environment. The county government has just applied to the National Science Foundation for funds to study the effects of geothermal development in the county and to prepare a geothermal element of the County General Plan.

Some of you may be familiar with the California General Plan Requirements but for those who are not, I can briefly summarize. The General Plan is to consist of development policies and shall include text and graphics setting forth the objectives, principles, standards, and proposals. The geothermal element, when adopted, would be the guide for development. It would allow the developers to know what the goals of the county are and would give the county decisionmakers a tool to use on developers. In order to understand the problem, a summary of the county should be given.

Imperial County contains one of the more unusual agricultural areas in the world. Here in the middle of an actual desert lies Imperial Valley, which can produce over a third of a billion dollars in crops and livestock annually. It is possible to produce up to four crops a year on some pieces of land because of the warm and extremely long growing seasons and the fact that the land is almost totally supported by irrigation water from the Colorado River. The irrigation water flows via the All American Canal to the center of the valley then flows northward via canals on the east and west edges of the irrigated area. There are 655,680 acres between the two eastern and western canals, and approximately 474,500 acres are in actual agricultural production. The county as a whole has approximately 4600 square miles, so the irrigated area is approximately 25 percent of the county.

Imperial County is also blessed with large acreage designated as geothermal resource areas. The Glamis, the Dunes, and the East Mesa KGRA's are outside the irrigated area and on principally government land. The Heber, Brawley, and the Salton Sea resource areas lie within the irrigated area and underlie privately owned land.

The County Board of Supervisors has adopted several policies concerning the relationship between agricultural land and geothermal development. In the "Terms, Conditions, and Standards for Initial Geothermal Development in Imperial County," adopted in 1971, it is stated that "it is the intent of this policy to encourage exploration and development projects, and to increase the store of knowledge surrounding this resource." The Ultimate Land Use Plan states that "agriculture is the current mainstay of Imperial County's economy; therefore, in order to achieve the General Plan goals, it is imperative that the agricultural land be guarded against noncompatible use." This policy was adopted on June 25, 1973.

Imperial County felt a specific responsibility to the people of the county to guide initial geothermal development within the county. The county assumed this responsibility through the zoning regulations as a means of control. Many of the KGRA's are on private lands, where the county's zoning controls are not questioned. In addition, the county has requested that our standards be imposed when the federal government issues geothermal leases.

In order to implement the zoning regulations, the County of Imperial prepared a series of "Terms, Conditions, and Standards for Initial Geothermal Development" and adopted it as a public policy for this development. It is the stated intent of this policy to encourage exploration and development projects and to increase the store of knowledge surrounding this resource. It is also the intent of this policy that there be coordination of existing anticipated data so that general planning may occur to provide the optimum development of the resource.

As described before, we want development compatible with our agriculture. The county now appears to be on the verge of an almost major geothermal development. The terms, conditions, and standards were satisfactory for individual exploratory wells, but they are not enough to evaluate a 50-megawatt generating plant with 10 geothermal wells.

To fill this void, the county approached the University of California at Riverside and the California Institute of Technology, Pasadena, to determine if they could assist us in preparing a geothermal element for the General Plan. It was realized early that most of the information needed to prepare such an element was not available. So the first order of research would be to study the effect of various types and sizes of development on all areas of the county. After this is done, we would be in a position to prepare the actual element.

In order to fund the basic research and the element, the county, with the very great assistance of the University of California, Riverside, has prepared a Grant Application and submitted it to the National Science Foundation, and we expect favorable action.

This geothermal research will be conducted by members of the faculty of the University of California, Riverside, and the California Institute of Technology in Pasadena. We will utilize the talents of geophysicists, engineers, sociologists, economists, geographers, and public relations experts to conduct research and to produce the following:

- (1) A geothermal element, which shows the proposed locations, zoning, and regulations of geothermal development.
- (2) An economic tradeoff study, which shows who gains and who loses from geothermal development by economic sector.
- (3) A sociologic study, which shows the impacts upon employment, families, ethnic groups, social structure, and interest parties affected.
- (4) A policy analysis, which identifies the political issues, alternatives, coalitions, and regulations that may resolve differences of interests.
- (5) A geographic study, which identifies the alternative geothermal well locations, development patterns, land use effects, agricultural losses, and environmental effects.
- (6) A geological assessment, which defines the extent and quality of the resource, in terms of heat, chemical composition, extraction problems, and costs of well development.
- (7) An engineering assessment, which identifies the costs associated with energy collection, conversion, waste water disposal, and environmental abatement.

The county will retain specialized personnel to insure that the answers are meaningful and to prepare the geothermal element. The county will organize an industrial committee made up of representatives in the geothermal industry area who will monitor progress and express industrial concerns. We will also establish a management committee made up of county officials who will insure inclusion of the county's interests. Each of these committees will have a periodic overview of the research progress and will be able to detect undesirable directions of research.

Once all this research is completed, the geothermal element will be prepared and, after multiple public hearings, will be adopted as county policy.

This plan will be prepared in such a manner that it will provide a roadmap for development of this resource or similar resources in other counties. In addition, the techniques used in research will also be transferable. Thus, once again, Imperial County may be used as a model in this field. We feel that we are progressive, small enough to be flexible, and large enough to be capable. This combination of county government is not always available. We consider ourselves fortunate to be able to interest NSF and the educational institutions in this problem, and we would expect this project to be invaluable to the County of Imperial and to other developable areas.