DOE/ET/27194--T4

G.R.I.P.S. COMMISSION

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GEOTHERMAL POLICY DEVELOPMENT PROGRAM

EXPEDITING THE LOCAL GEOTHERMAL PERMITTING PROCESS

Submitted to

U.S. Department of Energy

July, 1981

by

The G.R.I.P.S. Commission

Work Performed Under

Cooperative Agreement No. DE-FC03-79ET27194

Geothermal Research, Information and Planning Services / A California Joint Powers Agency

Lake County
Mendocino County
Napa County
Sonoma County

NOTICE

ABSTRACT

This study evaluates the local geothermal permitting practices of the four Geysers-Calistoga KGRA counties (i.e. Lake, Mendocino, Napa and Sonoma) in California, and the ways in which these processes could be expedited. The detailed analysis of local permitting processes undertaken in the course of this project revealed great variation in procedural approach, types of conditions imposed, phrasing of conditions and length of time it takes to process use permits; and these variations are described in the report. The analysis also revealed a number of interesting techniques employed by one or the other of the counties, or by Imperial County, to improve the process. These techniques are also described. Finally, four alternative approaches to expediting the local geothermal permitting process are identified.

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EXECUTIVE SUMMARY

For a number of years, concerns have been raised about the length of time and the complexity involved in obtaining required permits in order to develop the dry steam resource for producing electricity at The Geysers. The permitting process is complicated by a number of factors. Perhaps the most important factor is jurisdiction. At The Geysers, all three levels of government -- local, state and federal -- exercise significant authority over various aspects of geothermal development. In addition, several agencies within each governmental level play an active role in the permitting process. For example, Figure 1 indicates which agencies fulfill the lead agency responsibility at each stage of the development process.

Figure 1

LEAD AGENCY RESPONSIBILITY
AT DIFFERENT STAGES OF DEVELOPMENT

	AGENCY		
STAGES OF DEVELOPMENT	Counties	Division of Oil and Gas	State Energy Commission
Exploratory		X	
Field Development	X		
Power Plant Construction			X

The present study is concerned with the local permitting process, and the ways in which this process could be expedited. Although there is some question, due to the multitude of permits required by various governmental agencies, as to how much the development process would actually be expedited as a result of a unilateral speeding up of county use permit procedures, any county action to make the process faster would be beneficial if combined with similar efforts by other involved agencies. Moreover, the conclusions reached in this analysis, which are presented below in summary form, make it clear that there are a number of approaches which have already been tried and tested by one or more counties that could substantially improve each county's control over geothermal production without adding to the time of the permitting process. To the extent that these approaches simplified the work of the counties' staffs, there would also be some benefit in maximizing the effective use of available staff time.

The analysis conducted of the local permitting process in the four Geysers-Calistoga KGRA counties revealed great variation in procedural approach, types of conditions imposed, phrasing of conditions and length of time it takes to process use permits. Among the specific findings revealed in the analysis are the following:

- The great majority of use permit conditions are <u>not</u> unique to a specific project, but rather apply generally to all projects;
- The standards and conditions attached to use permits vary substantially between the four counties;
- There is sometimes confusing repetition between conditions or standards on a single use permit;
- Some of the conditions are ambiguously phrased;
- Most of the counties do not structure the conditions in a way that would facilitate evaluation by the Planning Commission or compliance by the developer.
- Due to the manner in which the conditions are developed there is a danger that some conditions may inadvertently be omitted;

- With regard to older permits, it is sometimes difficult and time-consuming for a person not familiar with a particular case to determine what transpired by reviewing the files and, in fact, it is occasionally difficult to locate the file at all;
- There is insufficient monitoring by the counties' staff to ensure that use permit conditions are adhered to;
- In a few situations in recent years, field development use permits have taken well over a year to process;
- Most KGRA counties require use permits for shallow well heat probes; and,
- Recent experience has shown that many exploratory use permits can be processed in from two to four months.

The analysis of the four counties' use permitting process, as well as the process employed by Imperial County, also revealed a number of interesting techniques employed by one or the other of the counties to improve the process.

- Lake County has created a draft ordinance that enumerates all of the conditions and standards that will be applied to geothermal use permits, and structures those conditions and standards in a way that facilitates evaluation by the Planning Commission;
- Lake County has eliminated the requirement for a use permit on shallow well (up to 500 feet) temperature probe holes that conform to certain criteria regarding such matters as location of the holes relative to existing roads and streams, toxic materials removal, planting, grading and inspection. Imperial County has taken a similar approach only they allow temperature probes up to 2,000 feet without a permit;
- Sonoma County is in the process of preparing a Geothermal Zoning District, and Imperial County has an established Geothermal Development Overlay Zone that achieves some of the same purposes;
- As a more refined approach that draws important distinctions between various parts of the KGRA, Sonoma County has adopted a Specific Plan covering a part of the KGRA that on the one hand identifies areas where geothermal development is not likely to effect Peregrine Falcon nesting areas, but where "...the maximum feasible mitigation of adverse

environmental effects" must be achieved, and on the other hand identifies areas where the impact of geothermal development on the Peregrine Falcons cannot yet be anticipated;

- Imperial County allows certain exploratory wells in non-sensitive areas to be processed using a Mitigated Negative Declaration instead of a full EIR;
- Sonoma County has in the past approved leasehold EIRs, and currently still approves many use permits by simply recertifying these leasehold EIRs;
- Imperial County has prepared and approved at least one Master EIR covering an entire KGRA (which is a much smaller area than the Geysers-Calistoga KGRA), and then requires only site-specific environmental information for future development;
- Imperial County has adopted a Geothermal Element to their County General Plan, and has assumed lead agency status over exploratory permits; and
- A couple of the KGRA counties utilize check-off lists that are kept with each file so that the status of the application can be quickly ascertained by anyone who is interested.

Figure 2 summarizes, for comparative purposes, the policy documents and ordinances utilized by each of the Geysers-Calistoga KGRA counties in planning for and controlling geothermal development.*

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*Note: The research done in preparation of this report was conducted during the spring and summer of 1980, therefore the status of the documents and procedures reported on is as of that period of time. The review and production processes have occupied the intervening time between fall, 1980 and the present.

Figure 2

POLICY DOCUMENTS AND ORDINANCES
UTILIZED BY GEYSERS-CALISTOGA KGRA COUNTIES
IN CONTROLLING GEOTHERMAL DEVELOPMENT

POLICY DOCUMENTS AND ORDINANCES	COUNTIES			
	Lake	Mendocino	Napa	Sonoma
1. County General Plan	In Preparation	In Preparation	X	X
2. Geothermal or Energy Element	In Preparation			
3. Specific Plan				X
4. Master EIR or MEA				X
5. Geothermal Zoning District				In Preparation
6. Use Permits	X	X	X	X
7. Adopted Standards and Conditions	X			

In order to facilitate a comparative analysis of the topics covered by conditions in each county's geothermal use permits, the following matrix has been prepared. This matrix does not, of course, provide any indication as to what the conditions state that are imposed by each county nor does it reveal which conditions are inappropriate, inconsistent, redundant or ambiguous. For a more detailed evaluation of the conditions, it is necessary to examine the individual county permitting procedures reports attached hereto.

Figure 3

TOPICS COVERED BY USE PERMIT CONDITIONS
- A COMPARISON BETWEEN COUNTIES -

TOPIC	COUNTY			
	Lake County	Mendocino County	Napa County	Sonoma County
1. Term Use Permit Valid	X	X	X	X
2. Severability	X			X
3. Modification and/or Revocation	X			X
4. Compliance with Other Laws and Regulations	X	X	X	X
5. Archaeology	X	X	X	X
6. Fire Protection	X	X		X
7. Blowouts	X			
8. Site Security	X			X
9. Access to Site and Limits on Area of Construction Activity	X	X	X	X
10. Radioactivity				X
11. Air Quality	X			X
12. Water Quality	X	X	X	X
13. Erosion	X		X	X
14. Noise	X			X
15. Road Maintenance	X			
16. Flora and Fauna	X		X	
17. Sanitary and Water Facilities	X			X
18. Safety	X			
19. Visual Impact	X			
20. Bonding			X	X
21. Insurance			X	
22. Liability			X	
23. Re-Entry	X			
24. Completion and/or Abandonment	X	X	X	X
25. Monitoring and Inspection	X	X		X
26. Level of Performance				X

In general there are at least four alternative approaches to expediting the local geothermal permitting process. These approaches, which are not mutually exclusive, include:

- Eliminating use permits and project EIRs at the exploratory and field development phases. This might be accomplished by putting together a package incorporating a Geothermal Element, specific plan and Geothermal Zoning District.
- Incorporating all the standard geothermal development conditions into a Geothermal Development Ordinance.
- Improving implementation of the CEQA process during the field development stage where the counties have the lead agency status by reducing the time required for preparation of the Draft E.I.R., reducing the time required for the consultant selection process, etc.
- Identifying areas at the time County General Plans, Geothermal Elements or specific plans are being prepared where no geothermal development will be allowed.

Obviously the effect that adopting one or more of the above approaches will have on expediting the geothermal permitting process will vary from county to county, depending on their current approach and the efficiency with which they now implement various parts of the process.

INTRODUCTION

For a number of years, concerns have been raised about the length of time and the complexity involved in obtaining required permits in order to develop the geothermal resource at the Geysers. The permitting process is complicated by a number of factors. Perhaps the most important factor is jurisdiction. At the Geysers, all three levels of government — local, state and federal -- exercise significant authority over various aspects of geothermal development. In addition, several agencies within each governmental level play an active role in the permitting process.

The present study is concerned primarily with the local permitting process, and the ways in which this process could be expedited. This report begins by looking at the local role in the overall permitting process, and then reviews the findings and conclusions that have been reached in other studies of the problem. This is followed by a case study evaluation of recent permitting experience in the four Geysers-Calistoga KGRA counties, and the report concludes by outlining several approaches to expediting the local permitting process.

It should be noted that the research done in preparation of this report was conducted during the spring and summer of 1980, therefore the status of the documents and procedures reported on is as of that period of time. The review and production processes have occupied the intervening time between fall, 1980 and the present.

A. THE LOCAL GEOTHERMAL PERMITTING PROCESS IN PERSPECTIVE

1. State and Federal Involvement in the Permitting Process

The geothermal permitting process involves a complex maze of requirements imposed by three levels of government as well as individually by numerous agencies within each governmental level. The process varies somewhat at each stage of development. It also varies to a considerable extent depending upon whether development is proposed on privately-owned land, on federal or state mineral rights land, or on federal or state-owned land although the counties have strongly maintained their authority to issue use permits irrespective of land or mineral rights ownership. One study by the Office of Planning and Research has pointed out that to drill a geothermal well at the Geysers, "... on either private or state lands, an operator must obtain a minimum of ten state permits and six county permits. If the well is to be drilled on federal lands, a similar number of permits is required."[1] Table 1 lists the principal state and federal agencies involved in the geothermal development process.

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[1]"State and Local Permit Study: An Analysis of Administrative Factors Affecting Geothermal Development at the Geysers", Governor's Office of Planning and Research, p. 23.

Table 1

PRINCIPAL STATE AND FEDERAL AGENCIES
INVOLVED IN THE GEOTHERMAL DEVELOPMENT PROCESS

State Agencies	Federal Agencies
State Lands Commission	Bureau of Land Management
Division of Oil and Gas	U.S. Geological Survey
Air Resources Board	U.S. Forest Service
Water Resources Control Board	Department of Energy
Department of Fish and Game	Environmental Protection Agency
Public Utilities Commission	
Energy Resources Conservation and Development Commission	
Department of Industrial Relations	
Department of Health Services	
Solid Waste Management Board	

2. Local Involvement in the Permitting Process

At the local level, the county Planning Department is the principal agency involved in the permitting process; however, a number of other county agencies are also often participants, depending on the particular nature of the proposed development project. The most important of these local agencies and their permitting responsibilities are listed below in Table 2.

Table 2

COUNTY AGENCIES INVOLVED IN THE GEOTHERMAL PERMITTING PROCESS

Agency	Type of Permit
Planning Department	Conditional Use Permit
Building Department	Building Permit
Public Works Department	Grading Permit Encroachment Permit Transportation Permit
Local Air Pollution Control District	Authority to Construct Permit to Operate
Regional Water Quality Control Board	Waste Discharge Requirements

In the Geysers area, the two agencies with the greatest impact on the local permitting process are the Planning Departments and the Air Pollution Control Districts. The other local permits tend to be issued relatively perfunctorily, and, in fact, several are often not required at all. However, the use permits and the Authority to Construct and Permit to Operate permits are required for most geothermal development projects and involve substantial effort to process. It is with these permits that any evaluation of local geothermal permitting procedures must be primarily concerned; although, as we have seen, these are only a part of a much more comprehensive, multi-levelled governmental permitting process.

As expressed in a 1976 State Attorney General's Opinion,

> "Counties and cities may regulate the drilling, operation, maintenance and abandonment of oil, gas and geothermal wells with respect to phases of such activities not covered by state statute or regulation so long as that regulation does not conflict with state regulation concerning other phases of such activities." 59 Ops. Atty. Gen. 461, 8/24/76

The four Geysers-Calistoga KGRA counties have each elected to regulate various stages of the geothermal development process through the exercise of their zoning authority. The State Planning and Zoning Law (Government Code, Section 65800 et seq) gives this authority to local governments; and the KGRA counties have chosen to utilize conditional use permits, a zoning devise allowed under the law, as the specific means of control.

Since the early years of geothermal development at the Geysers, local governments have played a key role in the overall geothermal permitting process, along with state and federal agencies. In the last few years, a major change in the permitting process has been the introduction of the requirements for preparation of Environmental Impact Reports and Environmental Impact Statements. While these requirements under the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 eq seq) do not apply exclusively to geothermal development, they do have a definite effect on geothermal permitting procedures. The effect has actually been twofold. In the first place, much more effort must be expended on environmental data gathering, analysis and presentation so that decision makers have more information at hand when they act on geothermal permits. Secondly, a new procedural structure has been imposed. The steps required under CEQA are extensive and have substantially expanded the previously relatively straightforward use permit procedure.

3. The Distribution of Lead Agency Status

In an effort to reduce the overlapping of requirements for environmental documentation imposed by the passage of CEQA, the lead agency responsibilities at various stages of the geothermal development process have been delegated to individual agencies. At the exploratory stage, the State Division of Oil and Gas (DOG) is now the lead agency; at the field development stage, the counties are the lead agency; and at the power plant construction stage, the California Energy Commission (CEC) is the lead agency.

This distribution of authority has been an attempt to rationalize the permitting process. Interestingly, it has not necessarily reduced local government's overall ability to control geothermal development since use permits are still issued at the exploratory and field development stages. This permitting authority, if used effectively, pretty well allows the counties to control when and where electric power production will occur. Moreover, as mentioned previously, AB 2644, passed by the legislature in 1978, provides that any county that has an adopted geothermal element to their General Plan, and meets certain other procedural criteria, can apply to take over lead agency status at the exploratory stage and assume responsibility for certification at the power plant stage. Thus, local counties could, should they so desire, position themselves to take over virtually complete control of geothermal development on private land.

During the past few years, local governments have made progress in implementing the CEQA process and in integrating CEQA

procedures with their established zoning procedures. At the same time, the Geysers-Calistoga KGRA counties have been developing their understanding of the somewhat unique requirements of geothermal development. It should be borne in mind that this learning process and these procedural adjustments have been going on at a time when fiscal restraints on local governments have been unusually severe, and may have limited their ability to respond as effectively as they might wish.

B. ANALYSIS OF EXISTING REPORTS REGARDING EXPEDITING THE LOCAL GEOTHERMAL PERMITTING PROCESS

This is not the first study of the geothermal permitting process. A number of other organizations have undertaken to look at the subject, both as part of broader research programs and as an individual topic of investigation. The purpose of this section of the report is to review some of the most important conclusions reached in these earlier studies.

1. Delays in the Permitting Process

A number of reports prepared by various agencies and research organizations have stated that the geothermal permitting process has been unnecessarily slow and complex. By implication, local governments might be seen as somewhat responsible for this situation. An example of these kinds of statements is contained in the study prepared by Jet Propulsion Laboratory in which it was concluded that, "Problems relating to Geothermal Development in California consist not only of technological and environmental problems, but of administrative and bureaucratic uncertainties and resultant delays in the geothermal permitting process."[1] A report by the California Energy Commission (CEC) staff also stated that:

> "Current procedures of various regulatory entities for permitting geothermal projects are time-consuming and often administered unevenly. Streamlining the review process and combining report requirements would result

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[1]Hussey, Elaine T., "Internal Operating Procedures for Public Agency Involvement in Geothermal Development in Lake County, California, Working Paper 6 -- Draft", Jet Propulsion Laboratory, Pasadena, November 29, 1976, p. 1.

> in considerable saving of time, effort, and money, and would remove some of the barriers to development perceived by industry, utilities and the financial sector."[1]

However, neither of the two studies quoted above offer any evidence to support their conclusions, nor do they refer to specific instances in which local governments in the Geysers-Calistoga KGRA have caused delays in the permitting process. They do, however, seem to reflect an attitude that may be fairly widely held among individuals in various private and public organizations involved in geothermal development.

As we have seen, there are reports that speak in broad terms about governmental permitting delays. There are also at least two studies that on the one hand state there are permitting delays at the local level, and, on the other hand, assign the blame for this, not on any recalcitrance on the part of local agencies or on unnecessary, complex or redundant permitting procedures. Rather, the blame is assigned to problems such as lack of staff, funding and experience. A report adopted by the California Energy Commission in 1978 concluded that, "Permits for geothermal developments are processed by local govenment agencies as expeditiously as possible with limited funds and personnel. They have indicated that additional qualified personnel, adequately funded, could speed the permitting process."[2] Another study by

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[1]California Energy Commission, "Toward an Alternative Energy Path for California: A Preliminary Action Agenda - Staff Draft", August, 1979, p. 2-21.

[2]California Energy Commission, "Geothermal Policy Report -- Recommendations for a Geothermal Resource Development and Power Plant Siting Program", March 22, 1978, p. 51.

Battelle in 1976, while recognizing that others may hold differing views, stated:

> "All use permits must be based upon adequate EIRs. The problems involved in obtaining these and other permits have been the target of a good deal of criticism and the source of a number of delays in the development process.
>
> "Many of the delays at the county level, both in environmental reporting and in the issuing of permits, could be corrected through institutional learning on the part of the potential developers and the public officials involved. These problems, therefore, will probably not require any major overhauls in the system. Such learning has already occurred in the counties where geothermal development has proceeded on a large scale."[1]

In addition, the Battelle report also concluded that public hearings were a cause of delay in local permitting procedures.[2]

Of specific interest to the Geysers was the analysis Battelle conducted of the time it took Lake County and Sonoma County to issue geothermal use permits. This analysis revealed that use permits were granted very expeditiously prior to 1973 when CEQA first took effect. For a couple of years following CEQA's introduction, the process slowed quite considerably as the local agencies adjusted to the new system. Then, as the counties became familiar with the procedures under CEQA, the processing times decreased, although not quite to their pre-CEQA levels (See Figure 1).[3]

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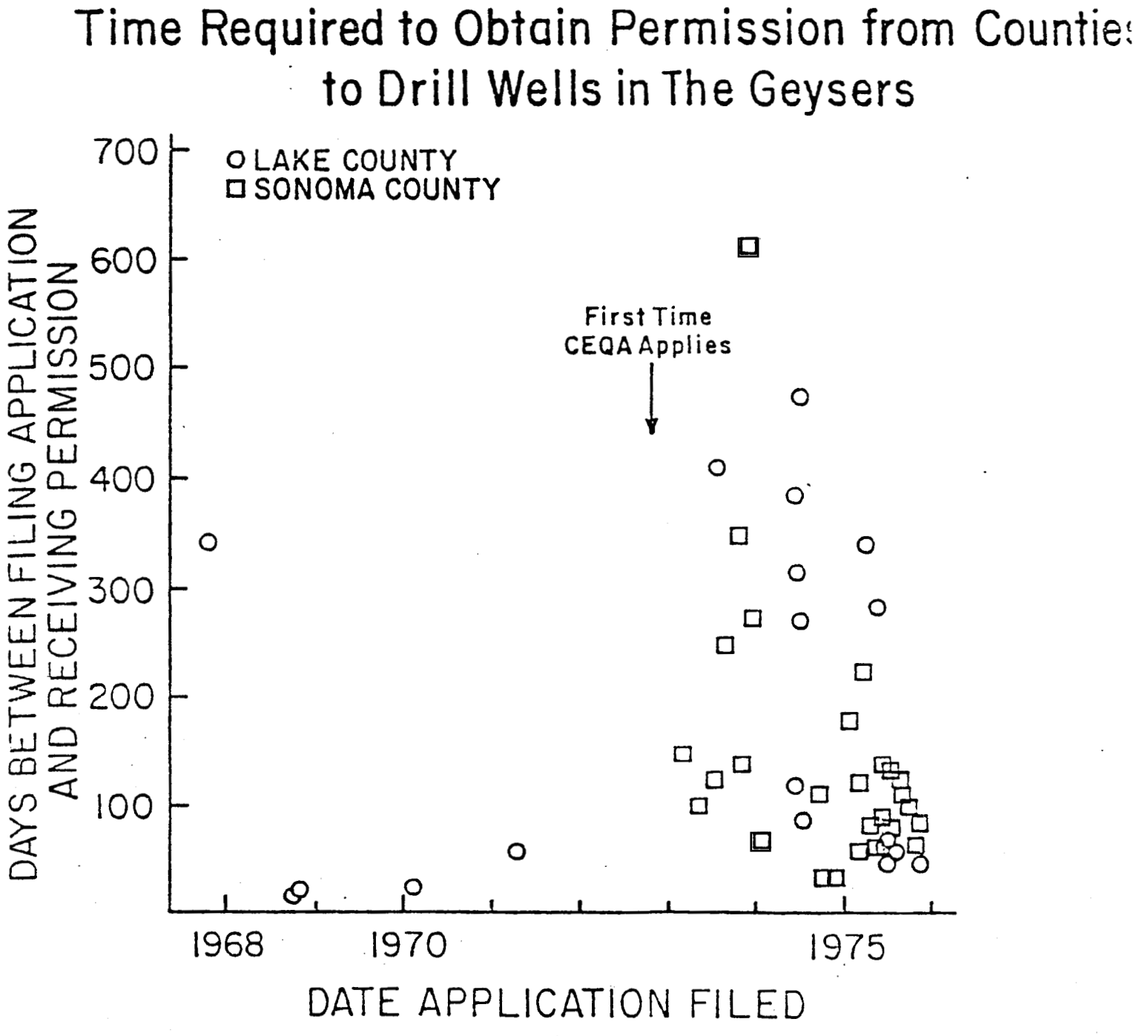
[1] Schuller, C. Richard, et al., "Legal, Institutional and Political Problems in Producing Electric Power from Geothermal Resources in California", Battelle, August 2, 1976, pp. 77-8.

[2] Ibid., p. 78.

[3] Ibid., p. 196.

FIGURE 1



Source: Schuller, C. Richard et al., "Legal, Institutional and Political Problems in Producing Electric Power from Geothermal Resources in California", Battelle, Aug. 2, 1976, p. 197.

Thus, the published reports that address the questions of delays in the permitting procedure either deal in broad, unsubstantiated generalizations about permitting delays by government (not specifically local government); or, where local government is specifically cited, they are inclined to lay the blame on lack of funds and staff or on confusion over new procedures such as CEQA, as well as on the public hearing process.

2. Suggested Approaches to Expediting the Permitting Process

Still speaking of the time it takes to process geothermal development permits, there seems to be some belief on the part of people who have addressed the issue that the availability of environmental baseline information could cut down on the length of time it takes to prepare EIRs and EISs and hence would foreshorten the permit proceedings. A Jet Propulsion Laboratory report concluded that limited environmental background data was one of the causes for delays in the regulatory process.[1] The Battelle study reached a similar conclusion, but also qualified it as follows:

> "Coordinated and broad-scale collections of baseline information then, can be of great help in speeding up the reporting process, but only if the following two conditions are met:
>
> 1. The information collected will be sufficiently detailed for the needs of individual environmental reports. (Often baseline data are collected at too coarse a level to be useful;

[1] Fredrickson, C.D., "Analysis of Requirements for Accelerating the Development of Geothermal Energy Resources in California", Jet Propulsion Laboratory, Pasadena, November 15, 1977, pp. 2-31 to 32 and 3-3.

efforts spent in this type of endeavor would be wasted.)

2. Several individual environmental reports, encompassing a large contiguous area, are expected in the near future. (If it appears that reports will be required on a patchy basis, it makes no sense to gather finely detailed data on a huge area. It is more economical to collect the data only as needed; otherwise, projects could be delayed pending completion of a needless survey.)"[1]

It has been suggested in a couple of studies, for example CEC's "Toward An Alternative Energy Path for California" (see p. 2-23), and Battelle's report (see pp. 340-1), that the development of a Master EIR might be an appropriate way to pull together this baseline environmental information.

Other approaches to shortening the permitting procedures of local government, such as the preparation of plans and zoning ordinances, have also been suggested. The State Geothermal Resources Task Force, comprised largely of staff members from various state agencies and members of the State Legislature, perhaps went the farthest in this regard when they declared, "The Task Force recommends that local jurisdictions adopt zoning ordinances designating areas for geothermal development. This recommendation would eliminate the need for the conditional use permits currently issued on a case-by-case basis."[2]

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[1]Schuller, op. cit. pp. 203-4.

[2]Grew, Priscilla C., "Report of the State Geothermal Resources Task Force", Office of Planning and Research, June, 1978, p. 66.

The Battelle report has taken a more cautious attitude. They discuss whether or not the preparation of a comprehensive plan could be effective in speeding up the decision-making process by eliminating the need for use permits on each project. In their analysis they point out that, "the counties are very much against any process that would eliminate their well-by-well control of geothermal development."[1] If this were, in fact, true, then the major advantage gained from the point of view of expediting the permitting decisions would possibly be to speed up the data-gathering process. However, the rest of Battelle's conclusion casts substantial doubt that there would be much effect in that regard.

> "Because the preparation or amendment of county land-use plans always takes a great deal of time and effort, we estimate the changes that this proposal would bring about in the geothermal development process as a low reduction in time involved, a zero reduction in money, and a medium reduction in trouble."[2]

On the one hand, we have the State Geothermal Resources Task Force arguing in favor of zoning with its concomitant planning base as a means to expedite the permitting process, and, on the other hand, Battelle raises significant doubts about the efficiency of such an approach. The State Task Force's credibility with regard to this specific recommendation is clouded somewhat by its composition, which does not include more than token local government representation. And, in addition, their credibility is called into question by their apparent incomplete understanding about how local zoning ordinances work. Their statement is inaccurate

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[1]Schuller, op. cit., p. 339.

[2]Ibid.

that, "By definition, zoning to permit geothermal development in designated areas precludes the issuance of conditional use permits on individual projects."[1] In fact, zoning ordinances can, and often do, require use permits for land uses that are permitted within specific zoning districts. The invalidity of their basic assumption about the nature of zoning ordinances obviously raises doubts regarding the validity of their subsequent conclusion.

3. Conclusions

On the basis of the available published material, when taken as a whole, it is not really possible to arrive at a firm view regarding the nature of delays in the local geothermal permitting process. In fact, in light of the only real evidence presented, i.e., in the Battelle study, it is questionable whether there are actually any delays currently occurring. That study clearly indicated delays in the years 1973 to 1975; however, toward the end of 1975, it appeared the processing times were being reduced considerably. Since there are no published data for subsequent years, G.R.I.P.S. has conducted an independent analysis of the most recent use permit processing times in each county. This analysis is discussed in the following section.

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[1]Grew, op. cit.

C. EVALUATION OF GEYSERS-CALISTOGA KGRA COUNTIES' RECENT PERMITTING EXPERIENCE

In the course of a geothermal development project carried all the way through from initial exploratory work to power plant construction, local governments are called upon to make an extraordinary number of decisions. Actually, many of these decisions have little or no relationship to the local General Plan, Specific Plan or Zoning Ordinance. For example, decisions on whether or not to issue a transportation permit for the movement of large vehicles, or a building permit for a structure related to geothermal development. Decisions regarding whether or not to require an EIR on a project also are largely unrelated to a geothermal element, specific plan or zoning ordinance, as are decisions by the Local Air Pollution Control Districts regarding Authority to Construct permits and Permits to Operate.

The decisions that local counties must make that do relate to geothermal elements, specific plans and zoning are mainly decisions about Conditional Use Permits. Over the full course of a geothermal project several use permits may be issued at the various stages of development. For example, one or more use permits may be issued for shallow well heat probes, for deep exploratory wells, and for full field development (including production wells, pipelines, etc.). To the extent that the overall geothermal permitting process can be expedited by the adoption of a geothermal element, specific plan or zoning, it would be in the area of use permits that the greatest benefits would be derived.

The process of use permit issuance is, of course, complicated by the environmental reporting requirements imposed by CEQA. These procedures, and the review periods required by CEQA, limit to some extent a county's ability to expeditiously review use permit applications. At the outside, state law (Government Code, Sec. 65950) requires that the process be completed within a one-year period. On the other hand, however, the number of steps in the process and the time requirements for review by the public and other involved agencies are such that it would be difficult to cut the processing time below about 37 weeks in cases where a full EIR must be prepared.

1. Exploratory Stage Use Permits

The passage in 1978 of AB 2644 gave the CEQA lead agency status over exploratory projects to the State Division of Oil and Gas (DOG), and imposed a 135-day time limit for DOG to approve or disapprove a project (see ATTACHMENT A for a flow chart of DOG's permitting process). Since the bill took effect, actual experience in issuing use permits has shown that the process can work quite efficiently. In Napa and Mendocino counties, the three most recent exploratory use permits have been issued in from 2 to 4 months, in spite of the fact that responsible agencies have up to 180 days to approve a project after the lead agency has approved it (Government Code Section 65952). None of these cases to date have involved the preparation of EIRs; DOG has determined that the projects in question qualified for categorical exemptions as "minor alterations of land". Two of the cases in question involved shallow temperature gradient wells, and the third case involved a deep exploratory well.

The experience to date under AB 2644, in situations not involving the preparation of an EIR, appears to be quite good, and, so long as the local counties don't choose to extend their use permit review time to the allowable 180 days after a DOG decision, it is probably not capable of being much more expeditious. Moreover, even in cases involving preparation of an EIR, so long as the counties render a decision on a use permit at approximately the same time as the DOG does, they will not be delaying the permitting process at the exploratory stage since the developer would have to be complying with the DOG's procedures during that time interval in any event.

2. Field Development Stage Use Permits

AB 2644 did not, of course, have any effect on the field development phase of development. At this stage in the process, the counties are the lead agencies from the point of view of CEQA, and may issue one or more use permits depending upon the developer's approach to the project. The only counties with experience in processing use permits for field development are Sonoma and Lake, since development hasn't progressed this far in either Mendocino or Napa counties.

In Lake County, of the four field development use permits that were reviewed, all of which required EIRs, the minimum processing time was one year; the maximum time was 20 months. Two of these use permits were issued after AB 884 -- which limits the processing time under CEQA to a one-year period -- took effect at the beginning of 1978.

The first of these was approved approximately 13 months after the application was accepted as complete; and the second one was approved by the Planning Commission in approximately 14 months, although this decision was appealed to the Board of Supervisors who rendered a final decision on the matter about 2 months later.

Since the beginning of 1978, Sonoma County has approved 3 field development use permits. None of the three required the preparation of an EIR since the Board of Zoning Adjustments that hears use permit cases was able to recertify a previously existing EIR. The time required to process these applications ranged from 2 months to slightly less than 5 months.

Based on this limited experience in the two counties, it would seem that Lake County at least, is having some difficulty in processing use permits within the statutory one-year period. Judging from the cases to date in that county, the biggest time lags in the process that may be susceptible to improvement are the time it has taken to prepare the Draft EIR after a contract has been executed (7 months in the most recent case and 8 1/2 months in the previous case), and the time it takes after an application has been accepted as complete until a contract is signed with a consultant to prepare the EIR (4 1/2 months in the most recent case and 3 months in the previous case).

It should be noted, however, that during a portion of the time that at least two of the Lake County permits were being

processed, and arguably during the entire time, the County Planning Department was severely understaffed. In fact for several months they were operating without the benefit of a Planning Director. There is little doubt that this chronic shortage of staff has had a deleterious effect on the speed with which permits can be processed.

D. ALTERNATIVE APPROACHES TO EXPEDITING THE LOCAL PERMITTING PROCESS

There are a number of possible ways to expedite the local geothermal permitting process. While there might be some value in having each of the four KGRA counties adopt the same (or at least similar) procedures, the contribution this might make in speeding up the overall geothermal development process is likely to be marginal. Therefore, the procedural approaches that are outlined below could be considered by each county on an individual basis. What might be appropriate and acceptable in one county may very well <u>not</u> be appropriate or acceptable in another. Differences between the counties in terms of the development pressures from geothermal, and disparate staff capabilities and priorities, provide rationale for opting for different approaches.

Four approaches to expediting the local permitting process are discussed below. They are not all mutually exclusive; several could be considered together. The approaches include the following:

1) Eliminating Use Permits and Project EIRs at the Exploratory and Field Development Phases;
2) Incorporating All the Standard Geothermal Development Conditions into a Geothermal Development Ordinance and Standardizing Processing Forms and Procedures;
3) Improving Implementation of the CEQA Process; and
4) Identifying Areas Where No Geothermal Development will be Allowed.

1. Eliminating Use Permits and Project-By-Project EIRs

Perhaps the most dramatic and effective contribution local governments could make toward facilitating geothermal development is to eliminate their requirements for use permits. This would, in turn, eliminate the necessity of fulfilling the requirements of CEQA as often as the current system necessitates. The elimination of use permits need not be done on a blanket basis. For example, certain areas could be identified where use permits would be unnecessary, or certain phases of development could be defined in which use permits weren't necessary, or, still further, certain criteria could be stipulated that would preclude the need for a use permit.

One way this approach might be implemented would be to prepare a Geothermal Element to the County General Plan (or a geothermal component of an Energy Element) in which the areas where the county wishes to facilitate geothermal development are identified. Subsequently, a Specific Plan for the area identified would be drawn up to implement the Geothermal Element. This Specific Plan would include an extremely detailed environmental analysis that could also be utilized in the Plan's EIR, and a fee schedule would be established (as provided for in Government Code, Sec. 65453(a)), perhaps on the basis of each well drilled, to recover the costs of preparing the Specific Plan. Following the adoption of the Specific Plan, a Geothermal Zoning District could be

created that incorporates all the standard geothermal use permit conditions, and that allows geothermal development (or certain types of geothermal development, for example, shallow exploratory wells) without a use permit, provided all the standard conditions are met. This might even be followed by application to CEC for lead agency status over exploratory projects. One of the principal benefits of this approach, in terms of expediting geothermal development, is that not only are the actual use permit requirements eliminated, but the concomitant CEQA requirements for each project are eliminated as well.

One simple form of this approach is already being implemented by Lake County. Under the Lake County system, use permits are not required for shallow well (500 foot maximum) temperature probe holes provided the project complies with stipulated criteria including such matters as the location of the holes relative to existing roads and streams, toxic materials removal, planting, grading and inspection. (See ATTACHMENT B for a list of Lake County's criteria.)

2. Establishment of a Geothermal Development Ordinance

In the sense that the term "expedite" means to make easier, it is possible for the County Planning Department staffs to make the processing of geothermal use permits easier by preparing a Geothermal Development Ordinance. This Ordinance would contain all the standard conditions for mitigating the effects of geothermal development. In this way, it would not be necessary for the staff to rethink

a lengthy list of appropriate conditions each time an application is considered, or refer back to previous use permits.

At the present time, of the four KGRA counties, only Lake County has an established -- if not yet adopted -- list of geothermal development conditions structured to ensure that each type of environmental impact (e.g., water quality, noise, etc.) is adequately considered at the time the use permit is issued. This kind of list can prove advantageous in several different ways. It reduces the possibility of overlooking an important condition in the rush of processing the permit; it allows the county to phrase each condition clearly and in a manner designed to accomplish the specific purposes for which it was intended; it reduces redundant and overlapping conditions; and it provides greater consistency between permits, thereby simplifying interpretation and enforcement. From the perspective of the developers, it also reduces the uncertainty that goes along with varying requirements, and reduces the time their field personnel and legal staffs must spend reviewing and understanding each permit.

One way to go about creating such an Ordinance would be to review conditions imposed by other counties, and select out those that seem appropriate. It might also make the permitting process easier in those counties that have not already done so to create standardized routing and check-off forms for keeping track of each application through the process.

It is uncertain how much time would actually be saved in obtaining a use permit by the establishment of an ordinance and forms, because all of the steps in the CEQA process would still have to be adhered to. It does seem reasonable, however, to expect that there would be less time wasted particularly by the county staffs in the course of processing each permit. The result being that staff time would be used more effectively.

In the interest of promoting better compliance with the conditions contained in use permits, it might be worth considering extending Lake County's approach to structuring their standard conditions. From the point of view of the county's staff and Planning Commission, and their interest in protecting the local environment, Lake County's proposed "Geothermal Resource Development Policy, Conditions and Performance Standards" are ideally structured to ensure that each aspect of the environment is adequately considered. However, once the permit has been reviewed and approved, this particular format may not be the most appropriate to promote compliance. The developers have a different perspective on the conditions; that is, they need to incorporate the conditions into various types or stages of construction activity. So that instead of seeing the situation from the point of view of plant associations, air quality and archaeological sites, they see it from the perspective of such activities as operation of heavy equipment, conduct of the drilling operation and site restoration. Perhaps, once the permit has been approved, the conditions could be reformatted to facilitate their use and understanding during the actual development process.

3. Improving the CEQA Process

Compliance with the requirements of CEQA perhaps has more to do with the length of time it takes to process a geothermal development use permit than any other factor. This is due to the numerous steps involved in the CEQA process, and the amount of information that must be generated. Of course the information brought to light in the EIR is used in making a decision on the use permit; and, presumably, if an EIR was not required, the data would have to be generated some other way in order to make an informed decision. Therefore, all the time spent on the EIR is not lost.

Since DOG is the lead agency for exploratory projects and operates under a 135-day maximum time period, there is very little that the counties can do to expedite the CEQA process at this stage. It is at the field development stage of the process that the counties have full control over CEQA, and thereby can influence the time it takes for compliance. As discussed on page 19, two of the points in the process that are most susceptible to expediting, to the extent that the process can be expedited at all, are the consultant selection phase and the draft EIR preparation phase.

At the consultant selection phase, it might be helpful to develop criteria or lists for quick reference as suggested in the CEQA Guidelines (Sec. 15154.2(b)(3)(B)) to determine the completeness of applications. Then the actual selection process should be simplified as much as possible by preparation of a standard RFP format that holds the requirements

for the proposal to a minimum and by contacting a limited number (three or four) of pre-qualified consultants on each project. This will reduce the time it takes to send out the RFP, to answer questions about the project from the consultants, and to review the proposals.

In the interest of reducing the time it takes to prepare a draft EIR, consideration should be given to the following ideas:

- Retain only those EIR consultants who are experienced in preparing EIRs for geothermal projects.

- Prepare a MEA covering those parts of the county where development is most likely to occur, and which can be referenced in project-by-project EIRs.

- Maintain a good library of environmental information relevant to geothermal development in the county, which is useable by EIR consultants.

- Prepare leasehold EIRs at the outset of development, and prepare either focussed EIRs or mitigated negative declarations for each subsequent project.

In achieving some overall reduction in the time it takes to go through the steps required by CEQA, it might help to establish time limits on each stage of EIR preparation as suggested by the CEQA Guidelines (Sec. 15154.2(b)(2)).

4. Identify Areas Where No Geothermal Development Will Be Allowed

Some of the KGRA counties have at some point in their planning process identified certain areas where geothermal development would not be appropriate. This is sometimes done by adopting an arbitrary standard prohibiting development within a specified distance of environmentally sensitive features such as a stream or archaeological site, or even prohibiting development within entire areas such as an intensively cultivated valley. To the extent that each county has additional such areas in which they will not approve geothermal development applications, it might be helpful to explicitly identify these areas in some form of Geothermal Exclusion Overlay Zoning District or by amending existing zoning districts that are located in appropriate areas to exclude geothermal development. Presumably this would have the effect of discouraging use permit applications from being filed in these areas, and would thereby eliminate the time wasted in processing such permits.

However, in this regard, it would be very important for any County considering the exclusion of geothermal power generation projects from an area to distinguish between that type of development and geothermal direct use projects whose effects are quite different.

5. Conclusion

The effect that adopting one or more of the above approaches will have on expediting the geothermal permitting

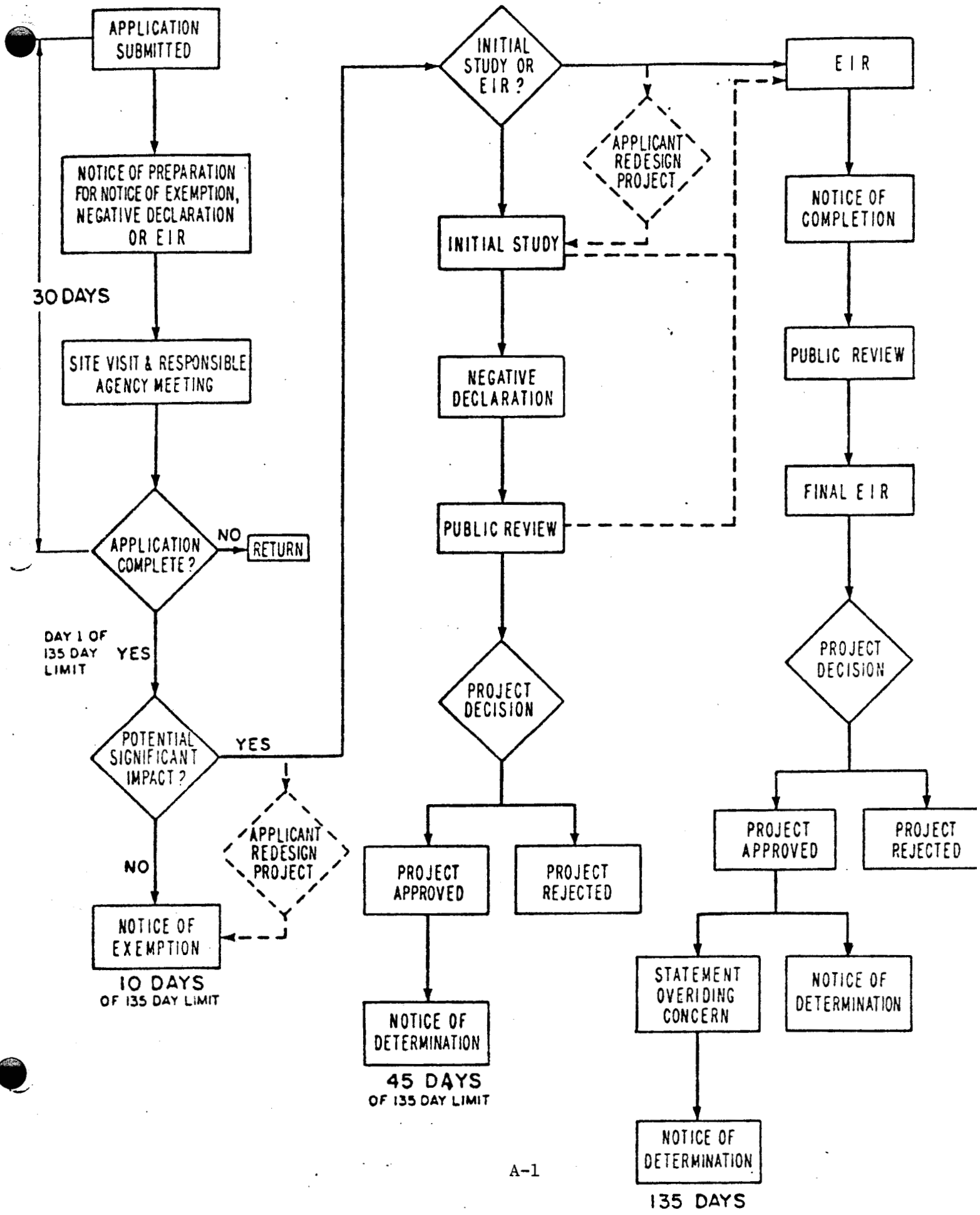
process will vary from county to county depending on their current approach and the efficiency with which they now implement various parts of the process. As indicated previously, eliminating the requirements for obtaining use permits (at least under certain circumstances) would be the boldest move toward expediting the permitting process. However, as a practical matter, individual counties may not be prepared to give up their project-by-project control over geothermal development. In that case, consideration should be given to the other approaches, which, depending on local circumstances, may also prove beneficial.

As a possible first step toward eliminating the use permit process, some thought might be given to adopting an ordinance or resolution containing a set of standard conditions for use in approving use permits. Then, depending on the level of success achieved in applying these standard conditions, the need for individual use permits might be phased out in the future.

It has been in response to our awareness of the unique circumstances of each county with regard to permitting that, at the request of two of the County Planning Directors, we undertook an individualized analysis of each county's use permitting procedure. The results of these analyses are contained in individual reports to each county and have been incorporated into this report as Attachment C.

DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

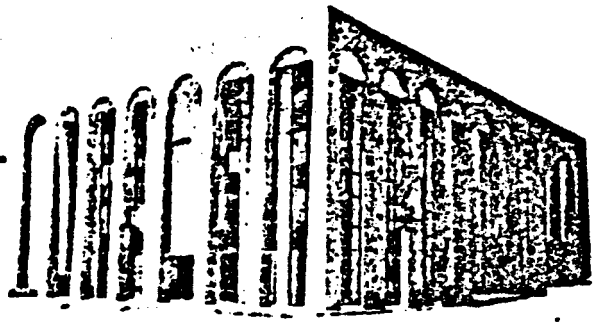
2644 ENVIRONMENTAL PROCESS



— COUNTY OF LAKE —

PLANNING DEPARTMENT
DONALD F. JOHNSON, Director

COURTHOUSE - 255 N. Forbes S
LAKEPORT, CALIFORNIA 95453
TELEPHONE 707 263-5461 Ext.



REQUIREMENTS FOR SHALLOW WELL TEMPERATURE PROBE HOLES

1. Submittal of map adequately depicting hole locations, township, range and section numbers.
2. Field inspection by company geologist and Planning Department staff.
3. Ability to drill within 50 feet of existing roads.
4. No cut or fill work on roads without Planning Department approval.
5. All toxic materials are removed from the site to a Class 2-1 dump site.
6. Minor grading only for the drill rig. Subject to approval by the Planning Department.
7. Replanting of all sites returning them to as near the original condition as possible.
8. No drilling within 200 feet of any stream without specific approval and maps for those areas.
9. Maximum drilling depth of 500 feet.
10. Notification to and inspection by the Planning Department upon completion.

NOTE: Use Permits are not required if the aforementioned items can be met.

BIW
12-3-76

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

ATTACHMENT C

ANALYSES OF LAKE, MENDOCINO, NAPA AND SONOMA COUNTY'S GEOTHERMAL PERMITTING PROCEDURES

D R A F T

August 30, 1980

Geothermal Research, Information and Planning Services / A California Joint Powers Agency

Lake County
Mendocino County
Napa County
Sonoma County

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

September 2, 1980

Mr. George Volker
Planning Director
Lake County Planning Department
255 North Forbes
Lakeport, CA 95453

Dear George:

Based upon a suggestion made by Pranab Chakrawarti and Dan Garvin at the meeting you were unable to attend in June here in our office, the staff of the GRIPS Commission has reviewed individually each county's use permitting procedures for geothermal electric power development projects. I have spoken to John Thayer about this and he seemed to feel it could be a useful project.

The Work Program for our Direct Heat Project (approved by D.O.E. as of August 1) also involves a review of the counties' policies and permitting processes. However, that review is related to development of geothermal direct heat applications; and we anticipate it will identify issues not touched in the enclosed review of your geothermal electric power development permit procedures.

When we meet with you, we will want to discuss how we can best integrate the information developed in the two studies. In the interim, you may want to consider identifying your present geothermal procedures as having application to power generation geothermal projects, and provide that direct heat proposals will be reviewed on a case-by-case basis pending development of a set of policies and guidelines specifically developed for direct heat permits.

In order to structure the evaluation of electric power permitting procedures, a list of criteria was drawn up that encompasses the most important elements of the permitting process. These criteria are as follows:

1. Time required for permit processing.
2. Ease with which the status of applications can be determined.
3. Site investigations conducted by staff and decision makers.
4. Relationship of permit processing to existing plans, policies and standards.

Mr. George Volker
September 2, 1980

5. Completeness of conditions.
6. Clarity of conditions.
7. Structure of conditions for Planning Commission review.
8. Structure of conditions for application by the developer.
9. Usefulness of environmental impact information.

The body of the report presents the overall conclusions reached as a result of an evaluation of each criterion. In addition, an Appendix has been prepared which provides a detailed evaluation of individual use permit conditions.

I hope you will find the information contained in the attached report useful. It has not been our intention to make this a definitive work. Rather, it is viewed as a survey of the existing situation which will serve as a basis for allowing us to work with the County's staff to improve the geothermal permitting process.

This report has been developed as a part of a contract between the GRIPS Commission and the DOE which has involved a review of county geothermal policies and procedures. We must submit a final report to DOE in draft form by December 1, 1980, under the conditions of this contract. We are hopeful of getting together with you during late October in order to receive your input on the report and to develop a projection of what action may occur as a result of the preparation and submission of the report. Of particular interest would be a determination as to whether you feel that there is any way we can assist you in making your County's permitting process more effective.

If you wish to receive copies of the use permits or conditions used by any of the other counties, please give Bob Van Horn or Paula Blaydes a call.

Sincerely,

Douglas K. Caldow

DOUGLAS K. CALDOW, AICP
Project Coordinator

DKC/seb:dr
Enclosure

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

ANALYSIS OF

LAKE COUNTY'S

GEOTHERMAL PERMITTING PROCEDURES

Prepared by

G.R.I.P.S. Commission

August 30, 1980

Geothermal Research, Information and Planning Services / A California Joint Powers Agency

Lake County
Mendocino County
Napa County
Sonoma County

INTRODUCTION

This report presents the overall conclusions reached as a result of the detailed evaluation of Lake County's geothermal permitting procedures. The evaluation consists of an analysis of nine criteria, and the overall conclusions that follow are presented under the headings of individual criteria. At the end of the report, in Appendix A, there is a detailed condition-by-condition analysis of a typical Lake County geothermal use permit focussing primarily on the completeness of conditions and on clarity of expression.

It will be noted that many of the ideas expressed in this report apply only to deep exploratory and/or field development projects rather than shallow temperature probes. Sometimes this is mentioned, and at other times, it is not. It should not be inferred from this that the generally more stringent conditions applicable to the major drilling projects should be applied to heat probes as well. Rather, the range of conditions are being presented for consideration in appropriate situations.

1. Time Required for Permit Processing

Based upon an evaluation of the case histories of several recent exploratory and field development use permits, it is apparent that the County has had some difficulty in processing the permits expeditiously. For example, of three exploratory use permits issued in the last couple of years (Aminoil, Moody; Aminoil, East Ford Flat; and NCPA) it has taken from three months to twelve and one-half months to approve the permits. The passage in 1978 of AB 2644 gave the CEQA lead agency status over exploratory projects to the State Division of Oil and Gas (DOG), and imposed a 135 day time limit for DOG to approve or disapprove of projects. Based upon some limited experience in the cases of the Republic/

Occidental, Wildcat and Sulphur Mound Mine Use Permits in which DOG has been the lead agency, the County has shown that it can work effectively on these exploratory permits. The essential element in working jointly on permit processing is good communication between agencies. Apparently, DOG and the County are doing a good job in this regard.

In the case of the full-field development use permits that were reviewed (Aminoil, Unit 16 Pipeline; McCulloch, DWR; Aminoil Castle Rock Springs; and Union, Upper Squaw Creek), the County again seems to have problems in processing the permits within the statutory time limits. The minimum processing time of these use permits, all of which required EIRs, was one year. The maximum time was twenty months. Two of these use permits were issued after AB 884 -- which limits the processing time under CEQA to a one-year period -- took effect at the beginning of 1978. The first of these permits was approved approximately 13 months after the application was accepted as complete; and the second one was approved by the Planning Commission in approximately 14 months, although this decision was appealed to the Board of Supervisors who rendered a final decision on the matter about 2 months later.

Judging from the cases that we have evaluated to date, the biggest time lags in the process that may be susceptible to improvement are the time it has taken to prepare the Draft EIR after a contract has been executed (7 months in the most recent case, and 8½ months in the previous case), and the time it takes after an application has been accepted as complete until a contract is signed with a consultant to prepare the EIR (4½ months in the most recent case, and 3 months in the previous case).

It is noted that during a portion of the time that at least two of the Lake County permits were being processed, and arguably during the entire time, the County Planning Department was severely understaffed. In fact, for several months, the County was operating without the benefit of a Planning Director. There is little doubt that this chronic shortage of staff has had a deleterious effect on the speed with which permits can be processed.

2. Ease With Which the Status of Applications Can be Determined

In the past, aside from going in to the individual case file and sorting through the various materials, there has not been a good system that would allow any member of the Planning Department staff to quickly check on the status of a particular geothermal use permit application. Currently the staff is working on the establishment of a permit status board that would utilize grease pencils and is intended to be hung on a wall. At the moment the format has been worked out, and small-scale versions are maintained by John Thayer and the Secretary of the Planning Commission at their desks.

In this regard, the County may wish to consider a system of wall mounted color-coded cards like Sonoma County uses. The principal advantage of this approach is that when processing is completed, the card becomes a part of the file, and therefore it is not necessary to maintain separate case file and status board records.

3. Site Investigations Conducted by Staff and Decision Makers

Site field investigations are currently seldom conducted by the staff for geothermal projects prior to the preparation of the Staff

Report. The workload simply doesn't allow time to be taken for this purpose. On the other hand, the members of the Planning Commission often take field trips to the sites of the proposed projects in order to develop a first-hand understanding of the effects of geothermal development on the environment. Unfortunately the staff is unable to accompany the Commission on these trips to draw the Commissioners' attention to specific elements of the project that may be of particular importance in rendering a decision.

4. Relationship to Existing Plans, Policies and Standards

The Lake County General Plan, which was adopted in September, 1967, and which has been amended from time to time, has been determined to be inadequate by the State Office of Planning and Research (OPR) imposed a series of limitations on the County's ability to approve development permits, until such time as the County's General Plan is brought into compliance with State law. However, the limitations that were imposed by the State have not affected geothermal development permit processing.

The County has budgeted approximately $150,000 to prepare a new General Plan, and has hired a consultant to assist them in this process. As part of this planning program, the County will be preparing a geothermal element; however, the completion of the plan is probably close to a year away.

Obviously, under these circumstances, the General Plan is unable to provide much guidance for decision makers such as the Planning Commission or staff to rely on in their daily work. On the other hand, the new General Plan, particularly the geothermal element, could set very definite direction for geothermal permitting decisions, and could provide the founda-

tion necessary for establishing a system of policies and standards that would work effectively in issuing permits.

This is not to suggest that the County is operating in a policy vacuum, however. In fact, on July 9, 1979, the Board of Supervisors adopted a policy which states:

> "Lake County has a potentially valuable geothermal resource that should be developed in an environmentally sound manner which is consistent with the predominant values of the local citizens.
>
> It will be the County's goal to provide for geothermal development as compatible with the rural quality of life now enjoyed in Lake County.
>
> Lake County's geothermal resource will be developed in a manner that will not result in violations of the Air Pollution Control District air quality standards.
>
> Exploratory and developmental projects will be expedited in those areas where there are no apparent land-use conflicts, air quality problems, or other environmental problems.
>
> Since most of the power generated in Lake County will be exported to benefit people in other parts of the state, it will be the policy of this board to encourage the development of the goethermal resource in such a manner that the social and economic benefits of the County and its communities will exceed the environmental cost.
>
> In general, the County will regulate geothermal development in a manner that will minimize environmental impact, maximize local benefit and not cause undue costly delays to the developer.
>
> Exploratory projects will be considered as separate from developmental projects for the purpose of the Planning Department and the Air Pollution Control District permit procedures.
>
> The granting of permission for exploratory geothermal projects in no way obligates the County to grant future permission for subsequent projects nor does it establish a precedent for geothermal field development.

It is in the best interest of the County to maintain control over the development of geothermal fields since the County has no control over the siting of power plants.

Because a distinction has been made between exploratory drilling and developmental drilling, it is essential that exploratory projects be regulated in such a manner to insure that they are, indeed, exploratory and not actually developmental projects.

Smaller scale geothermal developments for nonelectrical applications are to be encouraged as an important addition to the County's economic base.

In order to promote uniform development standards, the County will urge state and federal agencies to apply County standards to their projects and public lands.

It is the intent of the Board of Supervisors to retain local control over geothermal development that is compatible with this policy and to promote development."

In addition, Lake County has far surpassed the other KGRA counties in the development of a set of standards or conditions governing geothermal development. Although it has not yet been adopted, the proposed "Geothermal Resource Development Policy, Conditions and Performance Standards" is an attempt to identify the nature of the impacts of geothermal development, and to estabish a uniform set of conditions that can apply to future applications for use permits.

The County may wish to consider going still farther and developing a more comprehensive management program, building on the geothermal element which is being prepared, and these standards. A similar management program has already been put together by Imperial County. In that case, they started with a geothermal element to their County General Plan, and went from there to a Zoning District and a Master Environmental Assessment which

covers at lease one of the KGRAs in the County. The package seems to be working well for them according to reports from the County Planning Director and the Geothermal Coordinator. Moreover, the management program has enabled them to fulfill their desire to obtain lead agency status from DOG over exploratory projects. (Copies of Imperial County's Geothermal Element and Zoning District are on file in the G.R.I.P.S. Commission's library, and can be made available for review if desired.)

5. Completeness of Conditions

This section of the report addresses whether Lake County's geothermal use permit conditions deal with all the topics of relevance as well as all of the aspects of each topic that are important. In addition, questions of redundant conditions and unnecessary conditions are also addressed, and some overall conclusions are drawn. While the overall conclusions are presented here in the body of the report, a very detailed item-by-item analysis of each condition, and comparing Lake County's conditions with conditions imposed by other KGRA counties, is contained in the attached Appendix.

Although the County has drawn up a set of conditions and standards, a review of recent conditions applied on use permits, when compared against conditions imposed by other KGRA counties, would raise the questions as to whether it might also be useful to address the subjects of limits on the area of construction activity and access to the site, bonding, insurance, liability, and level of performance.

A similar type of problem concerns situations in which a subject is already addressed by one or more conditions, but where a particular aspect of the topic is not dealt with. For example, the County normally includes a number of conditions regarding erosion;

however, there is no requirement, such as Sonoma County has, that areas that have been reseeded be protected from grazing animals. This type of omission may have been deliberate, or it may represent an approach that was not considered at the time the use permit was approved. In any event, the conditions found in use permits issued by the other KGRA counties may suggest some approaches that Lake County may wish to incorporate in its own use permits. Points for comparison are presented in the Appendix.

Opposite to the problem of omission, is the problem of redundancy. Out review reveals that there is some minor redundancy between conditions contained on the same permit. Examples of this situation can be found in conditions dealing with modification and revocation. There is some possibility of confusion since the two conditions in which this topic is discussed are not proximate to one another.

Although it is unquestionably more important to insure that the conditions imposed are complete, the presence of unnecessary conditions can also have a deleterious effect in terms of the time spent preparing and reviewing the conditions, as well as in terms of the effect the document has in conveying an impression of being expertly conceived and authoritative. In Lake County's use permits there are a couple of conditions, or parts of conditions, which might be unnecessary that deal with the term the use permit is valid and noise.

While there are one or two problems regarding redundancy and unnecessary conditions, Lake County has generally done an outstanding job with regard to minimizing these problems. This is probably largely due to the use that is being made of the "Geothermal Resource Development Policy, Conditions and Performance Standards".

6. Clarity of Conditions

This section of the report evaluates the clarity with which use permit conditions are expressed. The evaluation was conducted to determine whether the conditions were either vague, ambiguous or abstruse. For the most part, conditions contained in Lake County's use permits have been expressed quite clearly. This is undoubtedly largely due to the fact that the phrasing has been well thought through and standardized in the "Geothermal Resource Development Policy, Conditions and Performance Standards", and serves as another sound reason for the creation of such standardized provisions.

7. Structure of Conditions for Planning Commission Review

Recent geothermal use permits which have been structured along the lines of the "Geothermal Resource Development Policy, Conditions and Performance Standards" are organized in a manner that is ideally suited to allowing the members of the Planning Commission to judge whether, in fact, all important consequences of a project are being considered in the conditions expressed.

8. Structure of Conditions for Application by the Developer

Although Lake County's conditions are structured in a way that facilitates review by the Planning Commission, it is questionable as to whether the conditions are structured in a manner that facilitates implementation by the developer once the permit is issued. While the Planning Commission's responsibility is to insure that each individual aspect of environmental impact is dealt with in the review of the proposed permit, the developer views the conditions from a different perspective. For him, the conditions are most useful if they are structured in a manner that reflects the

different construction phases. Perhaps this situation could be improved if, following approval by the Planning Commission, the conditions were reordered and new headings utilized, such as "Conditions Affecting Earth Movement" or "Conditions Relating to Abandonment of the Site", etc.

9. Usefulness of Environmental Impact Information

The considerable bulk of most EIRs undoubtedly mitigates against a close reading by the members of the Planning Commission; particularly when coupled with crowded agendas. The impression is thereby given that the Planning Commission must rely very greatly upon the staff for its input regarding potential environmental impact.

The staff in turn derives its environmental impact information from a couple of sources. Besides the EIR or EA, the most obvious source is from the development plan submitted along with a permit application. On the basis of the data provided by these sources, the staff report is written, and appropriate conditions are selected for the use permit. In this regard, it is most regretable that there is no time for the staff to get out in the field to conduct site investigations prior to preparing the staff report.

APPENDIX A

This Appendix provides a detailed item-by-item evaluation of geothermal use permit conditions found in a typical Lake County Use Permit (McCulloch Bottle Rock Steam Field Geothermal Project) a copy of which is provided as Appendix B. On the basis of conditions already imposed by one or more KGRA counties, twenty-seven individual topics were selected for evaluation to determine whether Lake County currently covers these topics (and covers all aspects of these topics), and whether the phraseology used in expressing each condition is clear. The primary method of analysis is to compare the completeness and clarity of Lake County's conditions with conditions used by the other three KGRA counties. Thus, conditions imposed by the other counties are often cited. The intent is not to suggest that the other counties necessarily handle a given topic better, and therefore, imply that Lake County should change its condition. Rather, the intent is simply to point out an option that the County may or may not have previously considered, so that the County can itself make a reasonable choice based on more complete information.

As used herein, "The County" shall refer to Lake County. And, the condition number cited in parentheses refer to the number of that condition in the Bottle Rock Use Permit provided as Appendix B.

1. Introductory Stipulations

The County's introductory statement (Condition B) regarding the grating of the permit being in the general public interest is an appropriate statement, as is the condition (I, 3) stipulating that the permit will be reviewed at the end of 18 months.

The County may wish to consider a condition referring to future permits which would state that, "Approval of this permit in no way implies approval of any other future permits on this lease." Sonoma and Mendocino counties both have conditions similar to this.

The County may also wish to consider the addition of a condition similar to one contained in Napa County's use permits, which states, "Changes shall not be made in the work described in this permit, whether in relation to location, dimensions, materials, or character of the work, without written authorization of the Commission, except in cases of an emergency."

Moreover, the County may wish to consider a site-specific stipulation similar to one utilized by Sonoma County, which states, "This permit is limited to the establishment of six drilling pads, designated as well sites a, B-1, B-2, C, D, and E in the EIR, and the drilling of a total of six wells on said pads."

2. Term Use Permit Valid

The County's standard condition (I, 1) in general appears quite adequate.

3. Severability

The County appears to have adopted a standard severability clause (I, K) essentially stating that if any part of the permit is declared invalid by a court that the rest of the permit should continue to be regarded as valid. Perhaps the County would want to consider reversing the standard severability clause along the lines that Sonoma County has done with regard to geothermal permits. Sonoma County's severability clause, which would give the County a chance to review the situation created by the loss of part of the permit through court action, states:

> "All conditions of this use permit are necessary to protect the general health, safety, and welfare, and to minimize or eliminate adverse environmental effects of the project. If any condition to this permit is held invalid by a court, then the entire permit shall be invalid. The Board of Supervisors specifically declares that it would not have issued this permit unless all of the above conditions are attached."

4. Modification and/or Revocation

The standard clauses (III, A and II, C) used by Lake County in this regard state as follows:

> "A. This use permit may be modified or revoked if the Lake County Board of Supervisors finds that the use to which this permit is put is detrimental to the health, safety, morals, comfort, and general welfare of the persons residing or working in the neighborhood of such use, or if it is injurious or detrimental to property and improvements in the neighborhood or the general welfare of the County, or is a nuisance.

C. That this use permit shall be subject to revocation or modification by the Board of Supervisors or Lake County if:

1. The Board finds that there has been noncompliance with any of the foregoing conditions or;

2. The Board finds that the use for which this use permit is granted is so exercised as to be substantially detrimental to the general public or to property in the vicinity of the use.

Any such revocation shall be taken pursuant to Section 21-84 of the Ordinance Code of the County of Lake."

It appears that the statement contained in condition C-2 is redundant of what is said in Condition A.

5. Compliance with Other Laws and Regulations

The standard Lake County clause (II, A) seems to be clearly stated. The County may wish to consider the addition of a condition similar to Sonoma County's, which, in general, provides that any noncompliance with a permit issued by a federal, state, or other local agency will be considered a violation of this use permit.

6. Archaeology

The County's standard condition regarding the protection of archaeological resources (I, G) appears to be well stated; however, the County may wish to consider adding the further stipulation similar to Mendocino County's that,

"If American antiquities or other objects of historical or scientific interest, including

but not limited to, historic or prehistoric ruins, fossils or artifacts are discovered in the performance of the permit, the item (s) for condition (s) will be left intact and immediately brought to the attention of the authorized officer."

7. Fire Protection

The County's standard conditions (I, C 13 & 14) regarding fire protection are quite good, however, consideration might be given to adopting standardized language suggested by the three Department of Forestry District Rangers whose jurisdiction encompasses the Geysers. The suggested language is as follows:

> "The applicant shall comply with the requirements of fire prevention practices and measures as prescribed by the Department of Forestry, and shall file with the Department of Forestry a Fire Prevention and Protection Plan.
>
> Provisions shall be made for adequate access by fire fighting equipment to the site and fire access maps shall be provided to the appropriate fire services.
>
> Prior to any work proceeding relative to this use permit, the parent company must advise the fire service agencies having jurisdiction."

8. Blowouts

The standard Lake County condition (I, C 10) appears to be perfectly adequate.

9. Site Security

The standard condition (I, C 19) in this regard appears to be perfectly adequate.

10. Access to Site and Limits on Area of Construction Activity

The County's standard condition (I, A 7) in this regard is fine. Consideration might also be given to the adoption of a general condition similar to Sonoma County's, which states,

> "The boundaries of the designated drilling pad and access road right-of-way shall be clearly marked, and no construction or transport of equipment shall be permitted beyond the prescribed boundaries of said pad and road right-of-way."

11. Radioactivity

The County has no standard radioactivity condition. In the case of use permits issued for geothermal power plants, consideration might be given to the adoption of a condition similar to Sonoma County's, which states in part, "...a radioactivity surveillance program satisfactory to the Radiologic Health Section, California Department of Health, shall be established."

12. The County standard conditions (I, E1-6, and I, C16) are quite extensive and may be unnecessarily overlapping the Lake County Air Pollution Control District regulations. When there are two sets of conditions in situations such as this, the possibility is open for conflicting provisions. The County may want to consider more generalized conditions similar to Sonoma County's which state as follows:

> "Prior to commencement of any excavation for road, well site construction, or drilling, an Authority to Construct shall be obtained from the Northern Sonoma County Air Pollution Control Officer.

"Construction and operations of these wells shall not cause any federal or applicable state ambient air quality standard to be exceeded, or be in violation of any district rule or regulation."

13. Water Quality

Most of the County's standard conditions with regard to the preservation of water quality (I D1-3; as well as I C3, 4 and 6) appear to be useful statements. However, the conditions (I C1 and 2) regarding sump design appear to unnecessarily overlap the Regional Water Quality Control Board's jurisdiction, and the County may wish to consider the adoption of a more general statement such as Sonoma County's, which says, "Prior to issuance of any building or grading permit, an application for waste discharge requirement shall be submitted to the North Coast Regional Water Quality Control Board."

The County may also wish to consider two additional conditions, similar to Sonoma County's, which state as follows:

"No construction activity shall occur in the immediate vicinity of any spring, nor shall they be conducted in a manner which will interfere with the flow or discharge of any spring or natural water course.

Drainage improvement shall be designed by a civil engineer in accordance with the Water Agency's flood control design criteria for approval by the chief engineer of the Sonoma County Water Agency and shall be shown on the improvement plans."

14. Erosion

The County's standard conditions (I E1-11) with regard to erosion seem to be well thought through, although they may go into more detail than is necessary since they do require that a registered

civil engineer prepare the plans. In addition, the dates October 10th to April 10th in which grading and excavation activities are not permitted, may be more specific than is necessary, and the County may wish to consider a more general statement like Sonoma County's which says, "Construction work shall be conducted in dry weather, and all of said plans shall be subject to approval by the Sonoma County Water Agency."

The County may also wish to consider a condition similar to Sonoma County's which says, "All areas which are re-seeded or re-forested shall be protected from grazing animals."

15. Noise

The County standard noise conditions (I F1-7) are well thought through and are probably perfectly adequate; however, condition Number 5, the County's jurisdiction over noise problems, may not be strictly necessary.

16. Road Maintenance

The County's condition (I C17) in this regard is probably perfectly adequate.

17. Flora and Fauna

The County's condition with regard to the protection of plant associations (I A1-7) appear to be perfectly adequate. The County has no standard clause regarding fauna nor, it should be noted, does any of the other three KGRA counties.

18. Sanitary Facilities and Water

The County's standard condition (I C9) seems to be perfectly adequate in terms of sanitary facilities; however, a clause should probably be added to include drinking water.

19. Safety

The County's standard condition (I C8) in this regard appears to be adequate.

20. Visual Impact

The County's standard conditions (I H1-4, and I C15) appear to be perfectly adequate, although condition I C15 might logically be combined with the other conditions dealing with visual impact.

21. Bonding

Lake County has no standard bonding condition. The County may wish to consider a condition similar to Sonoma County's, which states:

> "Prior to any construction or drilling, the applicant shall post a bond for each well authorized under this use permit to assure faithful performance of conditions of the permit. The bond is to be made payable to the County of Sonoma in the amount of not less than $10,000, of which $3,000 shall be cash. The cash bond of $3,000 may be in the form of certificates of deposit or similar guarantees of cash payment to the County, which guarantees cannot be revoked, withdrawn or cancelled by the applicant without approval of the Board of Supervisors. Requests by the County for payments from the cash bond fund shall be in the form of a resolution adopted by the Board of Supervisors. The Board of Supervisors may authorize a cash bond, in whole or part, to be replaced by a surety bond

in the same amount, when the Planning Director determines and recommends to the Board of Supervisors that the conditions of this use permit have been satisfied to the extent that a surety bond would adequately protect the County. The aforesaid performance bond or bonds for any single lease block shall not exceed a total amount of $50,000, of which not to exceed $15 may be cash."

In addition, the County may wish to supplement Sonoma County's bonding requirements with a phrase taken from Napa County's re-requirement, which states:

"The operator shall abate any public nuisance and adverse effect on public health, safety or welfare, caused by the project and return site as nearly as possible to its original state, The bond will indemnify the County for any costs incurred by the County in repairing any drill or test facility site, as nearly as possible, to its original state and in abating any public nuisance caused by an operator's exploratory or testing operations."

22. Insurance

The County has no standard insurance clause. Consideration might be given to the adoption, similar to Napa County's, which states as follows:

"Before commencing the project, the permitee shall show continuing evidence of insurance against liability in tort in a minimum amount of one million dollars arising from the exploration and testing activities or operations incidental thereto conducted or carried on under or by virtue of any law or ordinance. Such insurance shall be kept in full force and effect during the period of such operations."

23. Liability

The County has no standard liability clause in its use permits. Consideration might be given to the adoption of a clause similar to Napa County's, which states as follows:

> "Neither the issuance of this use permit nor compliance with the conditions thereof shall relieve an operator from any responsibility otherwise imposed by law for damage to persons or property; nor shall the issuance of this use permit hereunder serve to impose any liability on the County of Napa, its officers or employees, for injury or damage to persons or property. This use permit shall not relieve the operator of the responsibility of securing and complying with Napa County Ordinance No. 499 or any other permit which may be required by other County Ordinances, regional directives, or state or federal laws."

24. Re-Entry

The County standard condition (I J) regarding re-entry appears to be adequate, although consideration might be given to protecting the County's interests in case conditions surrounding the project change by amending the standard condition to read:

> "Upon approval of the Planning Director, applicant may re-drill or otherwise re-enter the same well bore of any well authorized under this use permit during the life of this project as long as all conditions of the use permit are met, and so long as circumstances bearing on the project have not materially altered."

25. Completion and/or Abandonment

Lake County's standard conditions (I, I1-4) seem to be appropriate and clearly stated. Condition Number I, C5 regarding the chemical analysis of sump fluids appears to be a rather complex procedure.

The County's condition (I C12) regarding solid waste removal provides a 60-day period for removal after completion of the well, which is longer than that allowed by Mendocino and Sonoma counties. The County may wish to consider a shorter time period such as Sonoma County's 30-day period. In addition, the County may wish to consider conditions similar to Napa County's and Mendocino County's which state as follows:

> "The applicant shall give notice of completion of geothermal exploration operations submitted in duplicate and containing the following information for each hole drilled:
>
> a. Final hole designation and location.
> b. A driller's log noting water table and water aquifers encountered (if determined) and salt, coal beds or other mineral deposits if present.
> c. Method of completion, cementing, and casting and/or tubing used.
> d. Complete details of abandonment procedures.
> e. Any information on drilling difficulties or unusual circumstances of operations, or protection of the environment in the area concerned."
>
> "These use permits are granted on the condition that the applicant reports to the County Planning Department by May 24, 1978, about the significance of the temperature gradient measure."

26. Monitoring and Inspection

The County may wish to consider supplementing or altering its standard condition (I, 2) that states, "The county reserves the right to inspect this project at any time after first attempting to notify the operator." Consideration might be given to the adoption of all or part of a condition similar to Sonoma County's, which states as follows:

"The applicant shall grant unrestricted access of his property to County representatives or to consultants or contractors hired by the County for inspection, enforcement, or monitoring activities deemed desirable by the County; the applicant shall designate an individual who is to be available at all times for purposes of supplying information and responses deemed necessary by authorized County representatives in connection with such work."

The County standard condition (I, D4) provides an interesting tie to specific monitoring programs and to the EIR for water quality monitoring. Some consideration may also be given to a more general monitoring requirement for other impacts similar to Sonoma County's which states:

"Applicant shall participate in any ambient air and/or water monitoring program required by the County or any of the aforementioned agencies; provided that the cost to the applicant of such participation shall be limited to $5,000 for each well and the monitoring program is commenced within three years after the spud in date of each well. The County will avoid the duplication of monitoring activities of other agencies."

The County may also wish to consider another condition similar to Sonoma County's which states,

"The applicant shall fully reimburse County for all costs incurred by the County in inspecting and monitoring compliance with the conditions of this permit and County Ordinances. The applicant shall reimburse the County within thirty days after County sends its bill to applicant for costs incurred."

Finally, the County may wish to consider a condition similar to Sonoma County's which states as follows: "The design engineer contracted to perform the engineering, geology and site design shall be responsible for the inspection of all construction procedures involving grading, compaction, drainage improvements, and site revegetation."

26. Level of Performance

The County has no standard conditions in this regard. Consideration might be given to conditions similar to those adopted by Sonoma County which state as follows:

"The Planning Director shall have the authority to require the applicant to eliminate, reduce, or otherwise control well emissions to reduce adverse effects that cannot be eliminated or adequately controlled, to the satisfaction of the Planning Director, by the regulation of any other public agency or agencies having permit authority over emission levels. Adverse effects include but are not limited to the effect of noise and odor on persons, property, wildlife or vegetation in the vicinity of the wells. The applicant agrees to comply with any reasonable requirements of the Planning Director to eliminate, reduce, or control said adverse effects.

The establishment of the pad, and the drilling and operation of the well, shall follow the appropriate mitigation measures as recommended on Pages...of the Final EIR for the project, and as required by the Planning Director. All activities pursuant to this Use Permit shall be conducted in such a manner as to prevent or minimize adverse environmental impacts. All equipment and techniques applied to the mitigation of noise and well emissions or discharges shall perform to a level equal to, or better than, any other existing method.

The Design Engineer shall certify to the County of Sonoma that the project has been completed according to the approved engineering plans, and the conditions attached to any and all permits issued for the purpose of Geothermal Development of the County of Sonoma."

COUNTY OF LAKE

USE PERMIT

McCULLOCH BOTTLEROCK STEAMFIELD GEOTHERMAL PROJECT

Pursuant to the approval of the Lake County Board of Supervisors on February 19, 1980, there is hereby granted to McCulloch Geothermal Inc., 10880 Wilshire Boulevard, Los Angeles, CA., a Use Permit for the Cobb Valley area, for a maximum of ten additional wells to be drilled on three pads, the existing Francisco, existing Coleman and proposed Pad #3 as identified in the Final E.I.R., and for accessory access roads and pipelines, including three injection wells to be located in Sections 5 and 6 T11n., R8W, MDB&M, in accordance with the Lake County Ordinance Code.

The Board of Supervisors finds that the establishment, maintenance or operation of the use for which application is made will not under the circumstances of this particular case be detrimental to the health, safety, peace, morals, comfort and general welfare of persons residing or working in the neighborhood of such use, or be detrimental to the general welfare of the County and that the proposed use is not a trival action with no significant impact on the environment.

The Planning Commission has caused to be prepared an Environmental Impact Report on the subject of this application and has held public hearings thereon and has carefully considered this matter pursuant to the California Environmental Quality Act and the State E.I.R. Guidelines pertaining thereto, and pursuant to the Environmental Protection Guidelines of the County of Lake.

1. Approval is subject to the following terms and conditions:

   1. The Use Permit shall be valid for a period of three (3) years from the date of approval; however, if the Use Permit is not used prior to February 19, 1983, it will become null and void, and the use may not proceed without the application for and approval of a new Use Permit. The Planning Commission may in its discretion approve time extensions.

   2. The County reserves the right to inspect this project at any time after first attempting to notify the operator.

   3. The Use Permit shall be reviewed by the Planning Commission at the end of eighteen (18) months and shall be subject to the following conditions:

   A. TO PROTECT PLANT ASSOCIATIONS:

      1. Specified pad, road, and borrow sites shall be evaluated by a qualified landscape architect, registered forester, plant ecologist or qualified person acceptable to the Planning Department and applicant, to determine which native plants should be replanted, which annual grasses shall be seeded and which non-native plants can be tolerantly sustained.

      2. Top soil shall be stockpiled for later respreading over the disturbed areas prior to re-seeding.

      3. When construction/drilling has been completed, revegation shall be programmed and shall commence in the fall following the construction. The revegetation program shall be directed by the landscape architect, registered forester, plant ecologist or other qualified person acceptable to the Planning Department and applicant.

      4. The entire revegetation program shall be re-evaluated during the spring following initial

planting and, if deemed by the Planning Department to be unsuccessful, additional regevetation will be required in the immediately succeeding fall season.

5. Except for large stumps, vegetation removed during construction shall be chipped and respread when beneficial as determined by person in Section A-1, or burned under the permits required by the Lake County Air Pollution Control District. Stumps may be buried outside of engineered fill and embankments.

6. In order to protect riparian and fen areas, as well as other vegetation on the leasehold, access to the drill-sites shall be restricted to existing roads and proposed roads as defined in the application.

7. Vegetation beyond the construction perimeter shall not be disturbed. The clearing limits for the pad shall be specified in the plans and specifications to be submitted for approval to the Planning Department.

B. TO PROTECT AGAINST EXCESSIVE SOIL EROSION, INDUCED LANDSLIDES AND SURFACE GEOLOGIC HAZARDS:

1. Plans for drill pads, steam transmission pipelines, sumps and access roads shall be prepared by a registered civil engineer with assistance from a registered engineering geologist. Topographic mapping by photogrammetric methods shall be used for design and be supplemented as necessary with ground surveys. Road, pipeline, and pad locations shall be staked on the ground and adjusted as necessary before completion of final plans. Plans shall include a separate drainage plan using five foot contour intervals and supporting calculations for culvert sizes using acceptable engineering methods. Plans shall show specific provisions for erosion protection along pipeline routes, at culverts and on cut and fill slopes. detailed specifications for construction should be prepared in a manner similar to applicable portions of "Forest Service General Provisions and Standard Specifications for Contruction of Roads and Bridges-1977" and "Regional Standard Specifications", a U.S.D.A. Forest Service. Plans, specifications and ground locations shall be approved by the Planning Department or their authorized representatives before starting construction, and shall also be approved by the Regional Water Quality Control Board prior to construction.

2. Drill pad and road fills shall be compacted to a minimum 90% relative compaction to minimize erosion. If significant erosion occurs as a result of any part of this project, applicant shall take prompt remedial action.

3. Filled slope banks shall not exceed a gradient of 2:1. Toes of all fills shall be stabilized with rock and gravel or keyed into stable soil and placed to reduce erosion potential to an absolute minimum on all fill slope banks. Revegetation of slopes shall be carried out as specified in Condition A. Unless approved by an engineering Geologist and Planning Department, cut slopes shall not exceed a gradient of 1½:1.

4. Subdrains shall be provided under all fills where natural drainage courses and seepage are evident.

5. No drill pad construction or access road shall be allowed on potentially active landslides, unless properly mitigated, subject to approval by the Planning Department.

6. Buffer zones of undisturbed vegetation shall be maintained 500 feet on either side of streams. No geothermal related construction shall take place within this buffer zone without specific approval from the Lake County Planning Commission. Roads crossing riparian areas shall be minimum safe widths.

7. A retaining levee of not less than eighteen (18) inches in height and three (3) feet in base thickness shall be placed on the perimeter of all fill areas including access road fills, pad site and reserve pit sites, to prevent storm runoff accumulation from random discharge.

8. Drainage plan to be submitted will distribute storm water runoff and channel it to existing natural waterways only to the extent that it will not increase water head to the point of unnatural channel abrasion. Energy dissipators and collection devices to reduce the erosion force of unnatural runoff will be required where determined by County or State Agency Representatives.

9. All grading activity shall be completed and all drainage structures shall be in place and operational prior to October 10 of any year. Grading and excavation activity may not be permitted during the consecutive period from October 10 to April 10. (It is understood that this is a general time frame. Extension beyond October 10 may be allowed by the Lake County Planning Director upon establishment of a suitable soil moisture specification for any stated activity).

10. Applicant shall agree to contract with the County of Lake for engineering and inspection services, as required, to a completion date agreed upon by the applicant and the County, to insure compliance with the above stated conditions. Such services shall be billed to the applicant and repayment by the applicant shall be deposited in the Lake County Geothermal Trust Fund.

11. In areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion.

C. ENVIRONMENTAL AND SAFETY PROTECTIONS:

1. The sump shall be designed by a registered civil engineer with assistance from a registered engineering geologist. Design of the sump fill shall be to a specification to withstand both static loads and dynamic loads (imposed by credible seismic events) with safety factors of 1.5 and 1.2 respectively. The sump shall be constructed of material compacted to minimum 95% relative compaction unless the Lake County Planning Director determines, based upon conclusive soil testing data, that a lesser compaction is adequate. The sump shall be lined with at least two feet of clay having a permeability not to exceed 1×10^{-6} cm./sec., or an equivalent impermeable membrane. Volume of the sump shall be sufficient to accommodate both the drilling mud and any reasonable amount of precipitation which could enter the sump.

2. The sump shall be operated in such a manner as to preclude overtopping of the sump. Three feet of free board shall be maintained at all times.

3. Applicant shall prepare a viable contingency plan for spills and emergency pumping of the sump in the event of a heavy, unexpected rainfall or if excessive geothermal fluids are encountered. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of construction.

4. Applicant shall prepare a viable contingency plan for emergencies due to breaks or unexpected deformation of the pipeline or its supports. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of testing or operations, and annually updated on anniversary of permits.

5. Prior to the removal of drilling equipment, sump fluids (both mud and supernatant liquids) shall be chemically analyzed, upon request from the Planning Department, for type and quatity of biologically sensitive materials, especially hazardous materials, heavy metals and acids. The chemical analysis shall be sent to the California Regional Water Quality Control Board and Lake County Planning Department for review. If said analysis does not indicate quantities in excess of allowable limits for either human or other important biological elements, especially those of the aquatic ecosystem, then sump materials shall be solidified, dried, mixed with native soil and buried. If hazardous or biologically sensitive materials are found, such materials shall be removed to a Class 2-1 or Class 1 disposal dump site as directed by the County or appropriate State Agency.

6. No hydrocarbon base cleaning agent, no waste oils or greases, and no liquid fuel shall intentionally be released directly onto the surface of a drill pad. All such liquids shall be contained and removed from the site. Any accidental discharge of the materials mentioned above shall be removed and properly disposed of by the applicant.

7. All unattended drilling equipment, well heads, sumps and ponds shall be protected from access by unauthorized persons by minimum 6 ft., locked, chain-link fencing.

8. Pipeline components which are exposed to ambient conditions at a temperature of 140 degrees fahrenheit or higher, where accessible to human reach, shall be designed to mitigate against inadvertent human burn injury.

9. Sanitary and hand washing vacilities shall be provided at the drill site and as specified by the Lake County Health Department.

10. In the event of casing blowout or other uncontrolled venting, the applicant shall move immediately to control the vent. No more than two (2) days shall elapse from the date of the uncontrolled vent to the date of equipment relocation to secure it.

11. Well discharge shall be directed away from adjacent woody vegetation and populated areas and appropriate energy dissipators shall be used as required by the Planning Department.

12. All solid waste material shall be removed from the site. Upon completion of drilling operations, unless otherwise approved by Planning Department, all equipment and materials unnecessary to the operation of the completed well shall be removed within sixty (60) days of completion of the well.

13. Applicant shall comply with the requirements of the fire prevention practices and measures as may be prescribed by the California Division of Forestry and/or County of Lake.

14. Provision shall be made for adequate sccess by fire-fighting equipment to the site, and fire access maps shall be provided to the appropriate Fire District (s).

15. Lights in the drilling rig shall be shielded so as to minimize visual impact at night to the portion of Bottlerock Road from which the drilling mast is visible.

16. Applicant shall provide the Planning Department with a plan which details the equipment and procedures which will be employed during powerplant outages (stacking periods) and during maintenance venting. This plan shall include proposed hours during which planned maintenance venting will occur as well as projected time which will elapse between unscheduled power plant outages and the throttling back of wells to minimum bleed. The plan shall include personnel available for unscheduled outages and projected response time of those personnel.

17. Applicant shall submit for the Planning Commission's approval a traffic control and road maintenance plan for High Valley Road. This plan shall take into account the great increase in heavy truck traffic which will accompany full field development of the Bottlerock site. The plan shall suggest mitigations which will prevent or alleviate the concomitant increase in danger due to traffic accidents and damage to the road which may occur following development.

18. Pipeline routes and design must be approved by the Planning Department prior to construction.

19. Prior to any construction activities, the applicant shall provide to the Planning Department for its approval a complete plan of development, showing locations of wells, pads, sanitary facilities, temporary and permanent storage and construction areas and buildings and the means by which these areas will be protected from unauthorized entry.

D. TO PROTECT AGAINST SURFACE WATER DEGRADATION:

1. In order to preserve the hydrologic integrity of this leasehold area applicant shall obtain by right or purchase all water used in drilling process or dust control.

2. The equipment service and fuel transfer areas and the area occupied by the drilling rig shall drain into the sump.

3. All fluids produced during testing after the sump has been filled shall be containerized and removed to a Class 1 or Class 2-1 disposal site, if required by the Planning Department or State Agencies.

4. The applicant shall continue to monitor the surface water quality of Kelsey and High Valley Creeks as required by the McCulloch Francisco Use Permit, and shall coordinate this water quality monitoring program with the ongoing California Department of Water Resources Water Quality Monitoring Program, said coordination being subject to approval by the Planning Department. Yearly microfaunal studies shall be initiated at times and locations specified in the McCulloch Department of Water Resources Bottlerock Steam Field EIR. Sampling procedures and parameters shall conform to those procedures and parameters outlined in the section entitled "monitoring", on pages 123 and 124 of that EIR.

5. If the applicant elects to conduct or participate in a larger and more comprehensive water quality program, it can be substituted for the requirements of D4. Such a proposal must be submitted to and accepted by the Planning Department and begun prior to the commencement of construction activities.

E. TO PROTECT AIR QUALITY:

1. Applicant shall meet all regulations and standards set

by the Lake County Air Pollution Control District and utilize on a continuous basis the state of the art of H_2S technology. This Use Permit does not supersede the authority of said District in any way.

2. After completion of geothermal wells, the H_2S emissions during standby venting of steam shall be either abated to acceptable level per Air Pollution Control District rules and regulations or standby venting shall be curtained to that level necessary to attain emission limitations. Curtailment methods to be utilized shall include the shutting in of geothermal wells as publicly agreed to by the applicant.

3. Applicant shall minimize vehicular dust on unpaved roads by the use of water or other acceptable dust retardant.

4. Applicant shall provide accurate chemical analysis of the geothermal resource if it is encountered, when required by the Air Pollution Control District.

5. The analysis shall include accurate "wet chemistry" and gas chromatograph determinations. Heavy metals such as lead, chromium, arsenic, antimony, mercury and cadmium should be determined as well as substances such as radon, hydrogen sulfide, boron, manganese, methane, fluoride, ammonia and carbon dioxide. The analysis should also include pH. The chemical analysis will be used in future use permit consideration for geothermal development on the project leasehold. The analysis shall be sent to the Planning Department within 45 days of completion of the well.

6. Applicant shall enter into agreements with Department of Water Resources or other parties as necessary and provide a written commitment and preliminary design of abatement systems as described in a letter dated February 15, 1980 from Ronald Robie, Director Department of Water Resources, to Lake County Air Pollution Control District which is acceptable to the Lake County Air Pollution Control District prior to all construction.

F. TO PROTECT AGAINST NOISE EXPOSURE:

1. Applicant shall meet a noise standard of Ldn 55 db (A) with a 10 db penalty between the hours of 10 P.M. and 7 A.M. of the following day at residences.

2. If measurements by the Planning Department indicate a possible violation of F.1, a measurement of the source noise in an appropriate location in the immediate vicinity of the source shall be made to determine if the source noise is sufficient to cause the level measured at F.1 to exceed 55 Ldn using the inverse square law. This source measurement shall be an equivalent sound level (Leq) averaged over a 24 hour period.

3. These regulations shall be adopted until a noise control ordinance is approved by the Board of Supervisors. Applicant agrees that the Planning Commission shall have the right to substitute the conditions of a General Noise Control Ordinance for the conditions of this section when adopted by the Board of Supervisors. It is understood by the Planning Commission and applicant that mufflers of advance design will be required for almost all geothermal operations in order to meet these standards and that extraordinary mitigative techniques such as lead/vinyl barriers and the wrapping of the drill rigs may be necessary to meet the noise standards of Section F-1 and F-2.

4. It is stipulated that the Lake County Planning Department will be spot monitoring noise levels in the vicinity of the proposed land use and that findings resulting from said monitoring may require the applicant, his contractors or agents to provide continuous noise level monitorings and readings as may be directed by the Planning Department.

5. It is also stipulated that the Planning Department has jurisdiction over noise investigation procedures and enforcement.

6. If the Planning Department receives noise complaints, the hours of heavy truck traffic to and from the site may be restricted to the hours between daylight and sunset only; except in cases of emergency.

7. Drill pipes shall not be laid in bins between the hours of 8 P.M. and 7 A.M. the following day.

G. TO PROTECT ARCHAEOLOGICAL RESOURCES:

1. Archaeological sites identified on pages 125-127 of the McCulloch Department of Water Resources Bottlerock Steamfield EIR shall be preserved in their existing state. No excavation or disturbance by the applicant or his contractors shall be permitted at these archaeological sites unless mitigated, subject to approval by the Planning Department and Sonoma State University's Resources Facility.

H. TO CONTROL VISUAL IMPACTS:

1. The revegetation program shall be formulated to include consideration of the visual impacts created by geothermal development.

2. Pipelines shall be colored in such a manner as to provide maximum color compatability with the vegetation type tyrough which it is routed. The choice of the color of the pipeline shall be made by the revegetation program contractor. Changes in color shall be made along the pipeline if necessary to blend with the background.

3. On visual edges such as ridgelines, low profile design approaches shall be employed.

4. All pad/road/pipeline sites shall be placed in areas, other environmental and engineering conditions being met, in such a manner that existing vegetation and topography will provide maximum screening.

I. UPON WELL ABANDONMENT:

1. The applicant shall abandon any well in accord with the Division of Oil and Gas Regulations.

2. Applicant shall refill sump and grade pad to reasonably restore a natural ground contour.

3. Applicant shall remove all pipelines and supports not necessary for field operation.

4. Applicant shall revegetate the pad and sump areas with woody vegetation that can be tolerantly sustained in accord with recommendations of the revegetation consultant or the procedure given in Condition A-1.

J. RE-ENTRY OF PRODUCTION OR SUSPENDED WELL BORES:

1. Applicant may re-drill or otherwise re-enter the same well bore of any well authorized under this Use Permit during the life of this project as long as all conditions of the Use Permit are met.

K. SEVERABILITY:

If any section, subsection, sentence, clause or phrase of this permit is for any reason held by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the remaining portions of the use permit. The Board of Supervisors hereby declares that it would have passed this use permit and each section, subsection, sentence, clause and phrase hereof irrespective of the fact that any one or more sections, subsections, clauses or phrases are declared invalid.

II. IN GRANTING THIS USE PERMIT, THE LAKE COUNTY BOARD OF SUPERVISORS MAKES THE FOLLOWING FINDINGS:

A. That this Use Permit does not abridge or supersede the regulatory powers or permit requirements of any State or Federal Agency or any Special District or other Lake County Department or Division which may retain an advisory or regulatory function as specified by statute or ordinance, nor does this Use Permit grant any title or other real property solely to this applicant or his assigns.

B. That the granting of this Use Permit is in the general public interest and that environmental and performance parameters conditioning the proposed activity as specified in this Use Permit and as contained in that document entitled "Conditions, Procedures and Performance for Geothermal Regulations, County of Lake" now referenced and made a part hereof, will allow the proposed activity with adequate safeguards to the welfare of the people of Lake County at large and to the people residing in the vicinity of said activity.

C. That this Use Permit shall be subject to revocation or modification by the Board of Supervisors of Lake County if:

1. The Board finds that there has been non-compliance with any of the foregoing conditions or:

2. The Board finds that the use for which this Use Permit is granted is so exercised as to be substantially detrimental to the general public or to property in the vicinity of the use.

Any such revocation shall be taken pursuant to Section 21-84 of the Ordinance Code of the County of Lake.

D. Noise levels from drilling operations will be muffled and times of other operations limited so as not to constitute a public nuisance.

III. THE BOARD OF SUPERVISORS FURTHER DECLARES THAT:

A. This Use Permit may be modified or revoked if the Lake County Board of Supervisors finds that the use to which this permit is put is detrimental to the health, safety, morals, comfort and general welfare of the persons residing or working in the neighborhood of such use, or

If it is injurious or detrimental to property and improvements in the neighborhood or the general welfare of the County, or is a nuisance.

Date of Issuance:

GEORGE R. VOLKER
Planning Director

By: _____
Irene L. Brown, Secretary

ACCEPTANCE

I have read and understand the foregoing Use Permit and agree to each and every term and condition thereof.

Date: _____

_____
Owner or Authorized Agent

DP;lds

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

September 2, 1980

Mr. Dan Garvin
Planning Director
Mendocino County Planning Department
880 North Bush
Mendocino, CA 95482

Dear Dan:

Based upon your suggestion at the meeting you attended in June here in our office, the staff of the GRIPS Commission has reviewed Mendocino County's use permitting procedures for geothermal electric power development projects.

The Work Program for our Direct Heat Project (approved by D.O.E. as of August 1) also involves a review of the counties' policies and permitting processes. However, that review is related to development of geothermal direct heat applications; and we anticipate it will identify issues not touched in the enclosed review of your geothermal electric power development permit procedures.

When we meet with you, we will want to discuss how we can best integrate the information developed in the two studies. In the interim, you may want to consider identifying your present geothermal procedures as having application to power generation geothermal projects, and provide that direct heat proposals will be reviewed on a case-by-case basis pending development of a set of policies and guidelines specifically developed for direct heat permits.

In order to structure the evaluation, a list of criteria was drawn up that encompasses the most important elements of the permitting process. These criteria are as follows:

1. Time required for permit processing.
2. Ease with which the status of applications can be determined.
3. Site investigations conducted by staff and decision makers.
4. Relationship of permit processing to existing plans, policies and standards.
5. Completeness of conditions.
6. Clarity of conditions.
7. Structure of conditions for Planning Commission review.
8. Structure of conditions for application by the developer.
9. Usefulness of environmental impact information.

Mr. Dan Garvin
September 2, 1980

The body of the report presents the overall conclusions reached as a result of an evaluation of each criterion. In addition, an Appendix has been prepared which provides a detailed evaluation of individual use permit conditions.

I hope you will find the information contained in the attached report useful. It has not been our intention to make this a definitive work. Rather, it is viewed as a survey of the existing situation which will serve as a basis for allowing us to work with the County's staff to improve the geothermal permitting process.

This report has been developed as a part of a contract between the GRIPS Commission and the D.O.E. which has involved a review of county geothermal policies and procedures. We must submit a final report to D.O.E. in draft form by December 1, 1980, under the conditions of this contract. We are hopeful of getting together with you during late October in order to receive your input on the report and to develop a projection of what action may occur as a result of the preparation and submission of the report. Of particular interest would be a determination as to whether you feel that there is any way we can assist you in making your County's permitting process more effective.

If you wish to receive copies of the use permits or conditions used by any of the other counties, please give Bob Van Horn or Paula Blaydes a call.

Sincerely,

Douglas K. Caldow /SEB

DOUGLAS K. CALDOW, AICP
Project Coordinator

DKC/seb:dr
Enclosure

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

ANALYSIS OF

MENDOCINO COUNTY'S

GEOTHERMAL PERMITTING PROCEDURES

Prepared by

G.R.I.P.S. Commission

August 21, 1980

Geothermal Research, Information and Planning Services / A California Joint Powers Agency

Lake County
Mendocino County
Napa County
Sonoma County

INTRODUCTION

This report presents the overall conclusions reached as a result of the detailed evaluation of Mendocino County's geothermal permitting procedures. The evaluation consists of an analysis of nine criteria, and the overall conclusions that follow are presented under the headings of individual criteria. At the end of the report, in Appendix A, there is a detailed condition-by-condition analysis of a typical Mendocino County geothermal use permit focusing primarily on the completeness of conditions and on the clarity of expression.

It will be noted that many of the ideas expressed in this report apply only to deep exploratory and/or field development projects rather than shallow temperature probes. Sometimes this is mentioned, and at other times it is not. It should not be inferred from this that the generally more stringent conditions applicable to the major drilling projects should be applied to heat probes as well. Rather, the range of conditions are being presented for consideration in appropriate situations.

1. Time Required for Permit Processing

Mendocino County has not processed any field development use permits in the past. Attention to date has been focussed on exploratory work, and three exploratory use permits have been issued. The first of these (#U 70-74), issued to Sun Oil Company for two wells in 1974, took only two months to issue although a subsequent appeal of the decision added another month-and-a-half to the time until it became effective. Surprisingly this project had an EIR approved within this time period. It is uncertain whether the EIR was actually prepared prior to the application being submitted, or, considering the date, whether the CEQA

process was rather perfunctory.

The second exploratory use permit (#U 13-78), issued in early 1979 to Sunedco for 3 wells up to 10,000 feet deep, took much longer. In fact, from the time the application was submitted, it took thirteen-and-one-half months to issue the permit. Of this period, approximately six-and-one-half months was consumed by the preparation of the draft EIR, another three-and-one-half months by the preparation of the final EIR, and a month was lost at the beginning while the applicant was completing the application. In addition, there was a month-and-a-half period between acceptance of the application and contracting with a consultant to prepare the EIR.

The final use permit (#U 37-79), issued in 1979 to Phillips Petroleum Company for four 500-foot heat probes, was processed under the provisions of AB 2644 in which the State Division of Oil and Gas (DOG) assumed lead agency status. No EIR was required for this project, and apparently the County was able to work effectively with DOG since the permit was issued in just over two months. Obviously, the essential element in working jointly on permit processing is good communications. It would appear the County and DOG are doing a good job in this regard.

If this last use permit can be taken as typical of how exploratory use permits will be processed in the future, the County's permitting procedure can be considered very expeditious. On the other hand, if the Sunedco experience where it took over a year is going to be the rule for exploratory permits, or for field development permits where the County remains the lead agency, then the time required will probably be seen as excessive.

2. Ease with Which the Status of Applications Can Be Determined

The Planning Department staff has created a system which enables any member of the staff to determine with relative ease the status of individual development applications. The case file is the primary resource in this regard. Within the case file is a checkoff sheet on which a record of the progress of the application is maintained during the course of processing. By referring to the checkoff sheet it is possible to see which steps in the permitting process have been completed.

If any EIR is required, then an EIR progress sheet is also maintained in a manner similar to the checkoff sheet. The office is also maintains a consolidated checkoff sheet, however, apparently this is not always used. And, finally, at the conclusions of the process, a copy of the Planning Commission minutes recording the action taken on the application is included in the case file.

Since there have been so few geothermal permits issued to date, there has obviously not been much of a problem in keeping track of them. Should the County experience a significant increase in geothermal use permit applications, or even in the number of other planning applications (rezonings, subdivisions, use permits, etc.), the County may wish to consider, perhaps in place of the existing case file and consolidated checkoff lists, a system of wall mounted color-coded cards like Sonoma County uses. The principal advantage of this approach is that when processing is completed, the card becomes a part of the file, and therefore it is not necessary to maintain two separate records.

3. Site Investigations Conducted by Staff and Decision Makers

It is the practice, in those few geothermal permits that have been issued to date, for the staff to conduct a site inspection prior to writing the staff report. In cases of deep exploratory well or field development wells it would also be desirable for the members of the Planning Commission to make a trip to the proposed site before acting on the matter in order to obtain a better understanding of the implications of the project.

4. Relationship to Existing Plans, Policies and Standards

The County's old General Plan, which has been found to be inadequate by the local Superior Court, did not have much to say about geothermal development, and thus it is unlikely that use permits issued in the past were greatly affected by it. The new Draft General Plan/EIR, which will replace the old Plan and which is being evaluated by the public in advance of public hearings scheduled for later this year, does recognize as an energy issue the, "Impacts of exploration and production of geothermal energy ...". However, the Draft Plan's goals, policies and recommendations do not, by themselves, provide sufficient guidance for decision makers, such as the Planning Commission, to rely on in their daily work.

In terms of zoning, the County does not have a "geothermal development district" in its Zoning Ordinance. Instead, geothermal development is allowed by use permit in certain districts. There are not adopted standards or conditions that apply to all geothermal development use permits, such as Lake County has developed but not yet adopted (see Appendix C). Nor has a "comprehensive geothermal-resource management program", similar to Sonoma County's proposed

program, been formulated or proposed. (Sonoma County's proposed program includes the County General Plan; preparation of specific plans; initiation of a Geothermal Development zoning district; and development of a Master Environmental Assessment.) On the other hand, the County has shown interest in developing an Energy Element to the General Plan, and it may be that more detailed policies and programs could emerge from that.

A geothermal management program already in effect in Imperial County started with the development of a Geothermal Element (rather than an Energy Element). Their management program includes a Geothermal Element, geothermal zoning district and a Master Environmental Assessment. The package seems to be working well for them according to reports from the County Planning Director and the Geothermal Coordinator. Moreover, the management program has enabled them to fulfill their desire to obtain lead agency status from DOG over exploratory projects. (Copies of Imperial County's Geothermal Element and zoning district are on file in the G.R.I.P.S. Commission's library, and can be made available for review if desired.)

5. Completeness of Conditions

This section of the report addresses whether Mendocino County's geothermal use permit conditions deal with all the topics of relevance as well as all of the aspects of each topic that are important. In addition, the question of unnecessary conditions is also addressed, and some overall conclusions are drawn. While the overall conclusions are presented here in the body of the report, a very detailed item-by-item analysis of each condition, and comparing Mendocino County's conditions with conditions imposed by other KGRA counties, is contained in Appendix A.

Since the County does not have an established comprehensive set of conditions to draw upon, other than the listing of conditions contained in prior use permits, there is no guarantee that all of the conditions that are appropriate will be included on a current use permit. For example, a review of recent conditions applied on use permits when compared against conditions imposed by other KGRA counties raises the question as to whether it might also be useful to address the subjects of severability, modification and revocation, blowouts, site security, limits on the area of construction activity, air quality, erosion, noise, road maintenance, flora and fauna, sanitary facilities, safety, visual impact, bonding, insurance, liability, re-entry, and level of performance.

A similar type of problem concerns situations in which a subject is already addressed by one or more conditions, but where a particular aspect of the topic is not dealt with. For example, the County normally includes a number of conditions regarding water quality protection; however, there is no requirement, such as Lake County has, that a contingency plan be prepared for emergencies due to pipeline breaks. This type of omission may have been deliberate, or it may represent an approach that was not considered at the time the use permit was approved. In any event, the conditions found in use permits issued by other KGRA counties may suggest some approaches that Mendocino County may wish to incorporate in its use permits. Points for comparison are presented in Appendix A.

Although it is unquestionably more important to ensure that the conditions imposed are complete, the presence of unnecessary conditions can also have a deleterious effect in terms of the time spent preparing and reviewing the conditions, as well as in terms of the effect the document has in conveying an impression

of being expertly conceived and authoritative. In Mendocino County's use permits, there are a few conditions, or parts of conditions, which might be unnecessary in that they deal with standards that actually fall under the jurisdiction of the State Division of Oil and Gas. For example, the conditions (Numbers 3, 5 and 10, listed in Appendix B) dealing with such matters as maintaining a supply of Borite on hand, completion of the holes in a manner as to prevent subsurface and interzonal migration of water and surface leakage, and artesian flows.

Perhaps the best way of avoiding these problems of completeness would be to create an ordinance or resolution establishing the basic conditions that will be required of all geothermal developers, and utilizing the most appropriate terminology for expressing those conditions. The analysis of the conditions normally imposed by the County reveals that few are site-specific in nature. In other words, they could be applied to virtually any geothermal development at The Geysers. Therefore, it might be useful to embody a set of basic conditions in the form of an ordinance, or, for ease of amendment, a resolution that would be automatically applicable to each new development proposal. Clearly, additional site-specific conditions could be drawn up as well. Lake County has made an effort to create such a standardized set of conditions, and a copy of this is provided as Appendix C.

6. Clarity of Conditions

This section of the report evaluates the clarity with which use permit conditions are expressed. The conclusion with regard to Mendocino County's conditions is that, for the most part, they

are expressed clearly. A detailed analysis of individual conditions is contained in the same Appendix which deals with the item-by-item evaluation of completeness.

7. Structure of Conditions for Planning Commission Review

There does not appear to be a clear and logical sequence to the conditions expressed in the typical use permit. For example, in the Phillips Petroleum Company use permit reviewed as part of this evaluation, condition Number 5, which deals with completion of the hole, would logically come toward the end of the conditions, instead, it is found near the beginning. Perhaps, more importantly, there is nothing about the sequence of the conditions, and no topic headings, which would allow members of the Planning Commission to judge whether, in fact, all important consequences of the project had been considered in the conditions expressed.

The situation might be improved if a standard set of conditions was adopted containing headings for each of the environmental concerns and the administrative factors that are typically incorporated in use permit conditions. In this way, there would be less likelihood of inadvertent omission of an important condition. Logically, conditions dealing with the same topic would be grouped together instead of scattered throughout the permit, as is the case in Phillips' use permit, in which completion of the hole is discussed in conditions Numbers 5, 10, 12, 13, 14, 17 and 18.

8. Structure of Conditions for Application by the Developer

Just as the conditions are not structured to assist the Planning Commission in their review of the permit, neither are the

conditions structured to facilitate implementation by the developer. While the Planning Commission's responsibility is to ensure that each individual aspect of environmental impact is dealt with in the review of the proposed permit, the developer, once the permit is approved, views the conditions from a different perspective. For him, the conditions are most useful if they are structured in a manner that reflects the different construction phases. Perhaps this situation could be improved if, following approval by the Planning Commission, the conditions were re-ordered and new headings utilized, such as "Conditions Affecting Earth Movement" or "Conditions Relating to Abandonment of the Site".

9. Usefulness of Environmental Impact Information

In a typical situation, the Planning Commission undoubtedly relies very greatly on the Planning Department staff for its input regarding environmental impact of a project. The staff, in turn, derives its environmental impact information from a number of sources. Besides the EIR, the two most obvious sources are from the development plans submitted along with the permit information, and from on-site inspection. In the Sunedco project, the most recent geothermal use permit application to require an EIR, the EIR provided an analysis of the impacts of the proposed project. However, in addition, the staff convened a meeting of representatives of agencies with jurisdiction over various aspects of geothermal development to discuss the types of impacts expected and the relative responsibilities of each agency. On the basis of the data provided by these sources, the staff report was written, and appropriate conditions were selected for the use permit.

APPENDIX A

This Appendix provides a detailed item-by-item evaluation of geothermal use permit conditions found in a typical Mendocino County use permit (U 28-77), a copy of which is provided as Appendix B. On the basis of conditions already imposed by one or more KGRA counties, 25 individual topics were selected for evaluation to determine whether Mendocino County currently covers these topics (and covers all aspects of each topic), and whether the phraseology used in expressing each condition is clear.

The primary method of analysis has been to compare the completeness and clarity of Mendocino County's conditions with conditions used by the other three KGRA counties. Thus, conditions imposed by the other counties are often cited. The intent is not to suggest that the other counties necessarily handle a given topic better, and, therefore, imply that Mendocino County should change its conditions. Rather, the intent is simply to point out an option that the County may or may not have previously considered, so that the County can itself make a reasonable choice based on more complete information.

As used herein, "The County" shall refer to Mendocino County. And, the condition numbers cited in parentheses refer to the number of that condition in U 28-77 contained in Appendix B.

1. Introductory Stipulations

The County's condition (20) denying the establishment of a vested right appears to be appropriate and clearly expressed. The other KGRA counties have a number of introductory stipulations not covered by Mendocino County, and the County may wish to consider adding conditions similar to the following:

- Sonoma County's condition which states, "This permit is limited to the establishment of six drilling pads designated as well sites A, B-1, B-2, C, D and E in the EIR, and the drilling of a total of six wells on said pads."

- Napa County's condition which states, "Changes shall not be made in the work described in this permit, whether in relation to location, dimensions, materials, or character of the work without written authorization of the Commission, except in case of an emergency."

- Napa County's condition which states, "The maximum depth of each temperature gradient hole be 152 meters (500 feet)."

- Lake County's condition which states, "That the granting of this use permit is in the general public interest and that environmental and performance parameters conditioning the proposed activity as specified in this use permit...will allow the proposed activity with adequate safeguards to the welfare of the people of Lake County at large and to the people residing in the vicinity of said activity."

2. Term Use Permit Valid

The County's condition (19) concerning the term of the permit is fine except where the permit refers to renewal, perhaps the phraseology should state "may be renewed" rather than "shall

be renewed". In addition, the County may wish to consider indicating more specifically the provisions for extending the permit similar to Sonoma County's which states, "...one extension of time up to one year may be granted pursuant to the provisions of Section 26-207.1 of the Sonoma County Zoning Ordinance."

3. Severability

Mendocino County does not have a condition regarding severability; and the County may wish to consider adopting a severability clause similar to Sonoma County's which states:

> "All conditions of this use permit are necessary to protect the general health, safety, and welfare, and to minimize or eliminate adverse environmental effects of the project. If any condition to this permit is held invalid by a court, then the entire permit shall be invalid. The Board of Supervisors specifically declares that it would not have issued this permit unless all of the above conditions are attached."

It should be noted that Lake County's severability clause has taken the opposite approach by stating:

> "If any section, subsection, sentence, clause or phrase of this permit is for any reason held by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the remaining portions of the use permit. The Board of Supervisors hereby declares that it would have passed this use permit and each section, subsection, sentence, clause and phrase hereof, irrespective of the fact that any one or more sections, subsections, clauses or phrases are declared invalid."

4. Modification and/or Revocation

Mendocino County has no standard clauses covering modification and revocation. The County may wish to consider adopting a condition similar to Sonoma County's which states, "This permit shall be subject to revocation of modification by the Board of Zoning Adjustments if: (a) the Board finds that there has been noncompliance with any of the foregoing conditions; or (b) the Board finds that the use for which this permit is hereby granted is so exercised as to be substantially detrimental to persons or property in the neighborhood of the use. Any such revocation shall be preceeded by a public hearing notice and heard pursuant to Section 26-225 of the Sonoma County Code."

5. Compliance with Other Laws and Regulations

The County's condition (1) is appropriate and clearly worded; however, consideration might be given to the addition of a phrase at the end which states, "Any violation or noncompliance as to any provision of federal, state and local laws, ordinances, or regulations shall constitute a violation of this use permit." Sonoma County has a similar phrase.

6. Archaeology

The County's standard condition (16) appears appropriate and clearly worded. The County may wish to consider the addition of an additional sentence, similar to Sonoma County's, which states, "Mitigations recommended in the EIR to protect the archaeological resources shall be followed."

7. Fire Protection

The County's standard condition (15) regarding fire protection covers the overall concerns regarding fire protection; however, the Department of Forestry's District Rangers that cover The Geysers have developed a set of standard conditions they would like each of the counties to consider:

"1. The applicant shall comply with the requirements of fire prevention practices and measures as prescribed by the Department of Forestry (in the County of Mendocino), and shall file with the Department of Forestry a Fire Prevention and Protection Plan.

2. Provisions shall be made for adequate access by fire-fighting equipment to the site and fire access maps shall be provided to the appropriate fire services.

3. Prior to any work proceeding relative to this use permit, the parent company must advise the fire service agencies having jurisdiction."

8. Blowouts

The County has no standard blowout condition. The County may wish to consider a condition similar to Lake County's which is as follows:

"In the event of a casing blowout or other uncontrolled venting, the applicant shall move immediately to control the vent. No more than two days shall elapse from the date of the uncontrolled vent to the date of equipment relocation to secure it."

9. Site Security

The County has no standard clause concerning site security. The County may wish to consider a condition similar to Sonoma

County's, which states as follows, "All unattended drilling equipment, wellheads, sumps, ponds and other hazardous equipment or facilities, shall be protected from access by unauthorized persons."

10. Access to Site and Limits on Area of Construction Activity

The County's standard condition (6) controlling access to the site is probably adequate for temperature probe use permits; however, in cases involving the development of pads, such as deep exploratory wells or field development wells, the County may wish to be more precise in its condition. For example, the County may wish to consider the adoption of a condition for exploratory and field development wells similar to Sonoma County's, which states, "The boundaries of the designated drilling pad and acess road right-of-way shall be clearly marked, and no construction or transport equipment shall be permitted beyond the prescribed boundaries of said pad and road right-of-way."

11. Air Quality

Mendocino County has no standard air quality condition. The County may wish to consider the adoption of conditions similar to Sonoma County's, which state:

> "Prior to commencement of any excavation for road, well site construction, or drilling, and Authority to Construct be obtained from the Northern Sonoma County Air Pollution Control Officer.
>
> Construction and operation of these wells shall not cause any federal or applicable state ambient air quality standard to be exceeded or be in violation of any district rule or regulation."

On the other hand, in the case of field development projects, the County may wish to be even more specific in its conditions, along the lines of Lake County's conditions, which state as follows:

"TO PROTECT AIR QUALITY:

1. Applicant shall meet all regulations and standards set by the Lake County Air Pollution Control District and utilize on a continuous basis the state of the art of H_2S technology. This Use Permit does not supersede the authority of said District in any way.

2. After completion of geothermal wells, the H_2S emissions during standby venting of steam shall be either abated to acceptable level per Air Pollution Control District rules and regulations or standby venting shall be curtained to that level necessary to attain emission limitations. Curtailment methods to be utilized shall include the shutting in of geothermal wells as publicly agreed to by the applicant.

3. Applicant shall minimize vehicular dust on unpaved roads by the use of water or other acceptable dust retardant.

4. Applicant shall provide accurate chemical analysis of the geothermal resource if it is encountered, when required by the Air Pollution Control District.

5. The analysis shall include accurate "wet chemistry" and gas chromatograph determinations. Heavy metals such as lead, chromium, arsenic, antimony, mercury and cadmium should be determined as well as substances such as radon, hydrogen sulfide, boron, manganese, methane, fluoride, ammonia and carbon dioxide. The analysis should also include pH. The chemical analysis will be used in future use permit consideration for geothermal development on the project leasehold. The analysis shall be sent to the Planning Department within 45 days of completion of the well.

6. Applicant shall enter into agreements with Department of Water Resources or other parties as necessary and provide a written commitment and preliminary design of abatement systems as described in a letter dated February 15, 1980 from Ronald Robie, Director Department of Water Resources, to Lake County Air Pollution Control District which is acceptable to the Lake County Air Pollution Control District prior to all construction.

16. Applicant shall provide the Planning Department with a plan which details the equipment and procedures which will be employed during powerplant outages (stacking periods) and during maintenance venting. This plan shall include proposed hours during which planned maintenance venting will occur as well as projected time which will elapse between unscheduled power plant outages and the throttling back of wells to minimum bleed. The plan shall include personnel available for unscheduled outages and projected response time of those personnel."

12. Water Quality

Mendocino County has very extensive conditions (3, 4, 5, 7, 8, 10, 11, 12, 13, and 14) for the protection of water quality. Many of these conditions appear to encroach into the Division of Oil and Gas' jurisdiction, and, therefore, may be unnecessary and inappropriate for the County to deal with. Of particular concern in this regard are conditions Numbers 3, 5, 10, 11, 12, 12 and 14.

Conditions Numbers 4 and 7, dealing with drilling mud storage and disposal are related and should be together.

The County may wish to consider the addition of conditions similar to Sonoma County's which state,

> "Drainage improvements shall be designed by a civil engineer in accordance with the Water Agency's flood control design criteria for approval by the chief engineer of the Sonoma County Water Agency and shall be shown on the improvement plans.
>
> Prior to issuance of any building or grading permit, an application for waste discharge requirements shall be submitted to the North Coast Regional Water Quality Control Board."

13. Erosion

The County has no standard erosion conditions in its use permit. The County may wish to consider the adoption of conditions similar to Lake County's which are as follows:

"TO PROTECT AGAINST EXCESSIVE SOIL EROSION, INDUCED LANDSLIDES AND SURFACE GEOLOGIC HAZARDS:

1. Plans for drill pads, steam transmission pipelines, sumps and access roads shall be prepared by a registered civil engineer with assistance from a registered engineering geologist. Topographic mapping by photogrammetric methods shall be used for design and be supplemented as necessary with ground surveys. Road, pipeline, and pad locations shall be staked on the ground and adjusted as necessary before completion of final plans. Plans shall include a separate drainage plan using five foot contour intervals and supporting calculations for culvert sizes using acceptable engineering methods. Plans shall show specific provisions for erosion protection along pipeline routes, at culverts and on cut and fill slopes. Detailed specifications for construction should be prepared in a manner similar to applicable portions of "Forest Service General Provisions and Standard Specifications for Construction of Roads and Bridges-1977" and "Regional Standard Specifications", a U.S.D.A. Forest Service. Plans, specifications and ground locations shall be approved by the Planning Department or their authorized representatives before starting construction, and shall also be approved by the Regional Water Quality Control Board prior to construction.

2. Drill pad and road fills shall be compacted to a minimum 90% relative compaction to minimize erosion. If significant erosion occurs as a result of any part of this project, applicant shall take prompt remedial action.

3. Filled slope banks shall not exceed a gradient of 2:1. Toes of all fills shall be stabilized with rock and gravel or keyed into stable soil and placed to reduce erosion potential to an absolute minimum on all fill slope banks. Revegetation of slopes shall be carried out as specified in Condition A. Unless approved by an engineering Geologist and Planning Department, cut slopes shall not exceed a gradient of 1½:1.

4. Subdrains shall be provided under all fills where natural drainage courses and seepage are evident.

5. No drill pad construction or access road shall be allowed on potentially active landslides, unless properly mitigated, subject to approval by the Planning Department.

6. Buffer zones of undisturbed vegetation shall be maintained 500 feet on either side of streams. No geothermal related construction shall take place within this buffer zone without specific approval from the Lake County Planning Commission. Roads crossing riparian areas shall be minimum safe widths.

7. A retaining levee of not less than eighteen (18) inches in height and three (3) feet in base thickness shall be placed on the perimeter of all fill areas including access road fills, pad site and reserve pit sites, to prevent storm runoff accumulation from random discharge.

8. Drainage plan to be submitted will distribute storm water runoff and channel it to existing natural waterways only to the extent that it will not increase water head to the point of unnatural channel abrasion. Energy dissipators and collection devices to reduce the erosion force of unnatural runoff will be required where determined by County or State Agency Representatives.

9. All grading activity shall be completed and all drainage structures shall be in place and operational prior to October 10 of any year. Grading and excavation activity may not be permitted during the consecutive period from October 10 to April 10. (It is understood that this is a general time frame. Extension beyond October 10 may be allowed by the Lake County Planning Director upon establishment of a suitable soil moisture specification for any stated activity).

10. Applicant shall agree to contract with the County of Lake for engineering and inspection services, as required, to a completion date agreed upon by the applicant and the County. to insure compliance with the above stated conditions. Such services shall be billed to the applicant and repayment by the applicant shall be deposited in the Lake County Geothermal Trust Fund.

11. In areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion."

14. Noise

Mendocino County has no standard noise condition. The County may wish to consider the adoption of a noise condition similar to Sonoma County's which states as follows:

> "The operator must give evidence to the Planning Director prior to the commencement of each phase of operation that he will use the most feasibly effective muffling equipment currently available in all phases of well drilling, cleanout, bleeding and testing, so that the noise level specified under this condition may be insured. Noise levels shall not exceed 65 dBA at the leasehold line; nor shall they exceed 65 dBA between 7 am and 10 pm, or 45 dBA between 10 pm and 7 am, as determined at any neighboring residential premises."

On the other hand, the County may wish to adopt still more precise noise conditions, similar to Lake County's, which state as follows:

> "Noise levels from drilling operations will be muffled and times of other operations limited as as not to constitute a public nuisance.
>
> TO PROTECT AGAINST NOISE EXPOSURE:
>
> 1. Applicant shall meet a noise standard of Ldn 55 db(A) with a 10 db penalty between the hours of 10 P.M. and 7 A.M. of the following day at residences.
>
> 2. If measurements by the Planning Department indicate a possible violation of F.1, a measurement of the source noise in an appropriate location in the immediate vicinity of the source shall be made to determine if the

source noise is sufficient to cause the level measured at F.1 to exceed 55 Ldn using the inverse square law. This source measurement shall be an equivalent sound level (Leq) averaged over a 24 hour period.

3. These regulations shall be adopted until a noise control ordinance is approved by the Board of Supervisors. Applicant agrees that the Planning Commission shall have the right to substitute the conditions of a General Noise Control Ordinance for the conditions of this section when adopted by the Board of Supervisors. It is understood by the Planning Commission and applicant that mufflers of advance design will be required for almost all geothermal operations in order to meet these standards and that extraordinary mitigative techniques such as lead/vinyl barriers and the wrapping of the drill rigs may be necessary to meet the noise standards of Section F-1 and F-2.

4. It is stipulated that the Lake County Planning Department will be spot monitoring noise levels in the vicinity of the proposed land use and that findings resulting from said monitoring may require the applicant, his contractors or agents to provide continuous noise level monitorings and readings as may be directed by the Planning Department.

5. It is also stipulated that the Planning Department has jurisdiction over noise investigation procedures and enforcement.

6. If the Planning Department receives noise complaints, the hours of heavy truck traffic to and from the site may be restricted to the house between daylight and sunset only; except in cases of emergency.

7. Drill pipes shall not be laid in bins between the hours of 8 P.M. and 7 A.M. the following day."

15. Road Maintenance

Mendocino County has no standard road maintenance condition. For use permits issued on field develpment projects, in particular, and perhaps also on deep exploratory wells, the County may wish to

consider the adoption of a condition similar to Lake County's which states,

> "Applicant shall submit for the Planning Commission's approval a traffic control and road maintenance plan for High Valley Road. This plan shall taken into account the great increase in heavy truck traffic which will accompany full-field development of the Bottle Rock site. The plan shall suggest mitigations which will prevent or alleviate the concomitant increase in danger due to traffic accidents and damage to the road which may occur following development."

16. Flora and Fauna

The County has no standard conditions regarding the proection of flora and fauna. The County may wish to consider the adoption of conditions similar to Lake County's which state,

> "In order to protect riparian and fen areas, as well as other vegetation on the leasehold, access to the drill sites shall be restricted to existing roads and propsoed roads as defined in the application.
>
> Vegetation beyond the construction perimenter shall not be disturbed. The clearing limits for the pad shall be specified in the plans and specifications to be submitted for approval to the Planning Department.
>
> Well discharge shall be directed away from adjacent woody vegetation and populated areas, and appropriate energy dissipators shall be used as required by the Planning Department."

None of the four KGRA counties utilizes a standard condition regarding fauna protection.

17. Water and Sanitary Facilities

The County has no standard condition covering the provision of water and sanitary facilities. Consideration might be given to

the adoption of a condition similar to Sonoma County's which states as follows,

> "Sanitary and handwashing facilities and a drinking water source satisfactory to the Public Health Officer shall be provided at the drill site."

18. Visual Impact

Mendocino County has no standard condition regarding visual impacts of geothermal development. The County may wish to consider adopting a set of conditions in this regard, such as those utilized by Lake County. Lake County's conditions are as follows:

"TO CONTROL VISUAL IMPACTS:

1. The revegetation program shall be formulated to include consideration of the visual impacts created by geothermal development.
2. Pipelines shall be colored in such a manner as to provide maximum color compatability with the vegetation type through which it is routed. The choice of the color of the pipeline shall be made by the revegetation program contractor. Changes in color shall be made along the pipeline if necessary to blend with the background.
3. On visual edges such as ridgelines, low profile design approaches shall be employed.
4. All pad/road/pipeline sites shall be placed in areas, other environmental and engineering conditions being met, in such a manner that existing vegetation and topography will provide maximum screening.

15. Lights in the drilling rig shall be shielded so as to minimize visual impact at night to the portion of Bottlerock Road from which the drilling mast is visible."

19. Bonding

Mendocino County has no standard bonding condition. The County may wish to consider a condition similar to Sonoma County's which states,

> "Prior to any construction or drilling, the applicant shall post a bond for each well authorized under this use permit to assure faithful performance of conditions of the permit. The bond is to be made payable to the County of Sonoma in the amount of not less than $10,000, of which $3,000 shall be cash. The cash bond of $3,000 may be in the form of certificates of deposit or similar guarantees of cash payment to the County, which guarantees cannot be revoked, withdrawn or cancelled by the applicant without approval of the Board of Supervisors. Requests by the County for payments from the cash bond fund shall be in the form of a resolution adopted by the Board of Supervisors. The Board of Supervisors may authorize a cash bond, in whole or part, to be replaced by a surety bond in the same amount, when the Planning Director determines and recommends to the Board of Supervisors that the conditions of this use permit have been satisfied to the extent that a surety bond would adequately protect the County. The aforesaid performance bond or bonds for any single lease block shall not exceed a total amount of $50,000, of which not to exceed $15,000 may be cash."

In addition, the County may wish to supplement Sonoma County's bonding requirements with a phrase taken from Napa County's requirement, which states,

> "The operator shall abate any public nuisance and adverse effect on public health, safety or welfare caused by the project and return site as nearly as possible to its original state. The bond will indemnify the County for any costs incurred by the County in repairing any drill or test facility site, as nearly as possible, to its original state and in abating any public nuisance caused by an operator's exploratory or testing operations."

20. Insurance

Mendocino County has no standard insurance clause. The County may wish to consider adopting a clause similar to Napa County's which states as follows:

> "Before commencing the project, the permitee shall show evidence of insurance against liability in tort in a minimum amount of one million dollars arising from the exploration and testing activities or operations incidental thereto conducted or carried on under or by virtue of any law or ordinance. Such insurance shall be kept in full force and effect during the period of such operations."

21. Liability

The County has no standard liability clause. Consideration might be given to the adoption of a liability clause or condition such as Napa County's which states as follows:

> "Neither the issuance of this use permit nor compliance with the conditions thereof shall relieve an operator from any responsibility otherwise imposed by law for damage to persons or property; nor shall the issuance of this use permit hereunder serve to impose any liability upon the County of Napa, its officers or employees, for injury or damage to persons or property. This use permit shall no relieve the operator of the responsibility of securing and complying with Napa County Ordinance No. 499 for any other permit which may be required by other County Ordinances, regional directives, or state or federal laws."

22. Re-Entry

Mendocino County has no standard re-entry condition. The County may wish to consider a condition which states as follows:

> "Upon approval of the Planning Director, applicant may re-drill or otherwise re-enter the same well bore of any well authorized under this use permit during the life of this project as long as all conditions of the use permit are met, and so long as circumstances bearing on the project have not materially altered."

This condition is based on one used by Lake County although it is stronger with regard to changes in circumstances surrounding the project.

23. Completion and/or Abandonment

Mendocino County's condition (17) which gives the operator 72 hours to clean up and restore the site may present problems for the developer in terms of this time deadline. The County may wish to consider giving the developer 30 days, such as Sonoma County does, or even 60 days, like Lake County's does, for cleanup and restoration. On the other hand, Napa County's provision in this regard requires that the cleanup occur before the rig leaves the site.

The County's condition (18), specifying the abandonment procedure, may actually overlap the Division of Oil and Gas' jurisdiction in this regard.

The County's condition (21), regarding reporting on the significance of the temperature gradient measured, is interesting although it may be difficult to enforce if developers regard this as proprietary information. Along these same lines, Napa County has an even more detailed reporting procedure upon completion, which states as follows:

> "The applicant shall give notice of completion of geothermal resources exploration submitted in duplicate and containing the following information for each hole drilled:
>
> a. Final hole designation and location.
> b. A driller's log noting water table and water aquifers encountered (if determined) and salt, coal beds or other mineral deposits, if present.
> c. Method of completion, cementing and casting and/or tubing used.
> d. Complete details of abandonment procedures.
> e. Any information on drilling difficulties or unusual circumstances of operations or protection of the environment in the area concerned."

The County may also wish to consider conditions similar to Sonoma County's which states,

> "All sumps and/or ponds shall be purged of environmentally harmful chemicals, back-filled, and compacted to the specification of the working portion of the pad, and seeded if required by the Planning Deirector at the time of removal of the drilling rig from the site."

In addition, consideration might be given to the adoption of a condition similar to lake County's which states:

"Prior to the removal of drilling equipment, sump fluids (both mud and supernatant liquids) shall be chemically analyzed, upon request from the Planning Department, for type and quantity of biologically sensitive materials, especially hazardous materials, heavy metals and acids. The chemical analysis shall be sent to the California Regional Water Quality Control Board and Lake County Planning Department for review. If said analysis does not indicate quantities in excess of allowable limits for either human or other important biological elements, especially those of the aquatic ecosystem, then sump material shall be solidified, dried, mixed with native soil and buried. If hazardous or biologically sensitive materials are found, such material shall be removed to a Class 2-1 or Class 1 disposal dump site as directed by the County or appropriate state agency."

24. Monitoring and Inspection

The County's condition (9), requiring that a graduate geologist be on the site at all times during drilling, is fine. The County may wish to go further and adopt conditions similar to Sonoma County's which state:

MONITORING AND INSPECTION

"The applicant shall fully reimburse County for all costs incurred by the County in inspecting and monitoring compliance with the conditions of this Permit and County Ordinances. The applicant shall reimburse County within 30 days after County sends its bill to applicant for costs incurred.

The applicant shall grant unrestricted access of his property to County representatives or to consultants or contractors hired by the County for inspection, enforcement, or monitoring activities deemed desirably by the County; the applicant shall designate an individual who is to be available at all times for purposes of supplying information and responses

deemed necessary by authorized County representatives in connection with such work.

The Design Engineer contracted to perform the engineering geology and site design shall be responsible for the inspection of all construction procedures involving grading, compaction, drainage improvements, and site revegetation.

Applicant shall particpate in any ambient air and/or water monitoring program required by the County or any of the aforementioned agencies; provided that the cost to the applicant of such participation shall be limited to $5,000 for each well and the monitoring program is commenced within three (3) years after the spud in date of each well. The County will avoid the duplication of monitoring activities of other agencies."

25. Level of Performance

The County has no standard condition in this regard. The County may wish to adopt conditions regarding the level of performance similar to those utilized by Sonoma County which state as follows:

"The establishment of the pad, and the drilling and operation of the well, shall follow the appropriate mitigation measures as recommended on Pages 3, 26-30b, inclusive; 39-44, inclusive; 46-47, inclusive; 51; 54; 56; 59-60, inclusive; 63; 68-71, inclusive; 74; 99-103, inclusive, of the Final EIR for the project, and as required by the Planning Director. All activities pursuant to this Use Permit shall be conducted in such a manner as to prevent or minimize adverse environmental impacts. All equipment and techniques applied to the mitigation of noise and well emissions or discharges shall perform to a level equal to or better than any other existing method.

The Design Engineer shall certify to the County of Sonoma that the project has been completed according to the approved engineering plans, and the conditions attached to any and all permits issued for the purpose of Geothermal Development of the County of Sonoma.

The Planning Director shall have the authority to require the applicant to eliminate, reduce, or otherwise control well emissions to reduce adverse effects that cannot be eliminated or adequately controlled, to the satisfaction of the Planning Director, by the regulation of any other public agency or agencies having permit authoirty over emission levels. Adverse effects include but are not limited to the effect of noise and odor on persons, property, wildlife or vegetation in the vicinity of the wells. The applicant agrees to comply with any reasonable requirements of the Planning Director to eliminate, reduce, or control said adverse effects."

APPENDIX B

PHILLIPS PETROLEUM COMPANY (MASONITE CORP.) U 28-77, 29-77, 30-77 and APPEAL: (Cont. from 5/23)

The vote on the final motion of approval had been continued and the Clerk read the motion as follows: It was moved by Supervisor Banker, seconded by Supervisor Cimolino that Use Permits 28-77, 29-77. and 30-77 be approved with the conditions as approved by the Planning Commission and that the Board finds that the proposed uses are compatible with the growing of timber and the harvesting of timber.

The appellants submitted a statement under the name of Susan Bodine and this was read into the record. Supervisor Barbero said he had had some doubts regarding the compatibility of the proposed test holes with timber production, but has ascertained that it will be a compatible use and has written findings that he would like included in the motion.

At this point, Supervisor Cimolino submitted an additional condition which he would like added to the 20 conditions, and upon motion of Supervisor Cimolino, seconded by Supervisor Barbero, and carried. IT IS ORDERED that the original motion be amended to add the following as condition 21: "These use permits are granted on the condition that the applicant reports to the County Planning Department by May 24, 1978, about the significance of the temperature gradients measured." Vote on rollcall to amendment to original motion:

AYES: Supervisors Barbero, Banker, Cimolino, Galletti, Eddie
NOES: None
ABSENT: None

The findings submitted by Supervisor Barbero in support of the finding that the proposed uses are compatible with TIZ to become a part of the original motion of approval were read into the record, and original motion of approval now reads as follows: Upon motion of Supervisor Bahker, seconded by Supervisor Cimolino, and carried, IT IS ORDERED that the Board makes the following findings for Use Permits 28-77, 29-77, and 30-77:

1. That the temperature gradient probes are compatible with the growing and harvesting of timber and timber products;

2. That since 20 temperature gradient probes will occur adjacent to existing roads, will be done in accordance with all the applicable County, State and

5/24/77

Federal regulations, will be regulated by the conditions imposed by the use permits, will be a maximum of 750 feet in depth, are for the purpose of determining the extent, if any, of the geothermal resource in the areas in question, that the 70 temperature gradient probes will not inhibit the growing and/or harvesting of timber;

3. That the temperature gradient probes will be developed in harmony with existing uses within the general area and will be compatible with the General Plan and zoning classifications in the area; 5/24/77

4. That after considering the land use activities of the proposed temperature gradient probes, that they will not be detrimental AND that use permits 28-77, 29-77, and 30-77, be approved with the following conditions:

1. Exploration operations shall be conducted in compliance with all Federal State and local laws, ordinances, or requisitions which are applicable to the operations including but not limited to, those pertaining to fire, sanitation, conservation, water pollution, fish, and game. All operations hereunder shall be conducted in a prudent manner.

2. All drill holes shall be capped when not in use and appropriate procedures shall be taken to protect against hazards in order to protect the lives, safety, or property of other persons or of wildlife and livestock.

3. A supply of Borite will be on hand (and used if necessary) to control artesian flow, as well as lost circulation zones and minimize loss of drilling fluids to formations being penetrated. In no case will poisonous or otherwise toxic drilling fluid additives be employed.

4. No mud pits will be excavated and a portable tank will be utilized to contain drilling mud.

5. Holes will be completed in such a manner as to prevent subsurface interzonal migration of water and surface leakage by: a) running a capped string of pipe from surface to total depth; b) filling the annular space between hole and pipe with heavy drill mud and cuttings to 10' below ground level and with cement from 10' to 6" below the surface; c) filling the pipe with water and; d) placing a cap on the pipe.

6. Access to proposed hole locations will be on existing roads and trails wherever possible. Where "cross county" travel is necessary, equipment will be moved across the shortest distance possible from an existing road or trail to the hole location. Once a route is estabished, all equipment travel will be restricted to this route. Whenever possible, equipment will be routed around existing vegetation. 5/24/77

7. Drilling mud and cuttings shall be buried or otherwise disposed of in a manner satisfactory to the Regional Water Quality Control Board.

8. No hole locations will be selected with 300' of perennial streams or lakes, or within a 1,500° radius of hot springs, fumaroles or other surface geothermal indicia.

9. A graduate geologist experienced in the proposed geothermal operations will be on site at all times when drilling is being conducted.

10. If artesian flow occurs, the hole will be completed as detailed in Condition #5, with the exception that the annular cement plug will be placed from total depth to surface.

11. During drilling operations, mud return temperature will be taken and recorded every 10'.

12. If mud return temperature reaches 120°F, all drilling operations will cease and circulation will be maintained for thirty minutes while monitoring and temperature and mud tank volume for possible hot artesian flow or lost circulation. If neither occurs, pipe will be run to total depth and the hole will be completed as in Condition #5. If artesian flow is noted, the hole will be completed as in Condition #10. If lost circulation occurs, it will be controlled with lost circulation material and completed as in Condition #5.

13. If there should be a sudden marked increase in mud return temperature of several degrees in only a few feet, all drilling operations will cease and circulation will be maintained for thirty minutes monitoring and mud tank volume for possible hot artesian flow or lost circulation. If neither, then drilling will continue cautiously while keeping careful watch on mud return temperature and mud tank volume. In no case will drilling operations continue after mud return temperature reaches 120°F. Depending on conditions, hole will be approximately completed as in Condition #5 or #10. 5/24/77

14. If flowing steam or hot water (150°F) is encountered, further drilling will stop immediately and the hole will be completed as in Condition #10. 5/24/77

15. Every effort will be made to minimize the possibility of fire. Ground fires will be built only in areas clear of vegetation for a radius of 10'. Internal combustion engines operated on site will be equipped with an U.S.F.S. approved spark arrester. The applicant shall notify the Department of Forestry of commencement of operations and shall comply with all regulations.

16. If American antiquities or other objects of historic or scientific interest including, but not limited to, historic prehistoric ruins, fossils or artifacts are discovered in the performances of the permit, the item(s) or condition(s) will be left intact and immediately brought to the attention of the authorized officer.

17. Within 72 hours of completion of each hole, the site shall be cleaned of all trash and debris and shall be restored as nearly as practical to its original condition.

18. After the desired data has been obtained, the holes will be abandoned by: a) cutting off pipe 6" below ground level; b) filling the top 10' of pipe with cement and; c) covering the hole with dirt to original surface contour. Except as otherwise noted, all test equipment, both surface and subsurface, will be removed at the completion of the exploration operations.

19. The term of these permits shall be for a period of one year from the date of approval and shall be renewed if geothermal exploration are to continue beyond that date.

20. Permittee understands and agrees by acceptance of this limited permit that issuance of this permit in no way establishes a vested right or permission for permittee to further develop these geothermal sites despite any exploration expenses incurred by permittee in furtherance of this permit. Permittee further acknowledges that a full Environmental Impact Report will be required at some stage if further development permits are requested.

21. These use permits are granted on the condition that the applicant reports to the County Planning Department by May 24, 1978, about the significance of the temperature gradient measured.

Rollcall on motion as amended:

AYES: Supervisors Barbero, Banker, Cimolino, Galletti, Eddie
NOES: None
ABSENT: None

Assistant District Attorney submitted written finds in support of the Board's decision not to require an Environmental Impact Report in connection with Use Permit: 28-77, 79-77, and 30-77, and upon motion of Supervisor Banker, seconded by Supervisor Galletti, and carried, IT IS ORDERED THAT THE Chairman be authorized to sign the findings in suport of the Board's decision not to require an EIR in connection with these mentioned use permits. This information is on file in the office of the Clerk of the Board of Supervisors, Courthouse, Ukiah. 5/21/77

COUNTY OF LAKE

USE PERMIT

McCULLOCH BOTTLEROCK STEAMFIELD GEOTHERMAL PROJECT

Pursuant to the approval of the Lake County Board of Supervisors on February 19, 1980, there is hereby granted to McCulloch Geothermal Inc., 10880 Wilshire Boulevard, Los Angeles, CA., a Use Permit for the Cobb Valley area, for a maximum of ten additional wells to be drilled on three pads, the existing Francisco, existing Coleman and proposed Pad #3 as identified in the Final E.I.R., and for accessory access roads and pipelines, including three injection wells to be located in Sections 5 and 6 T11n., R8W, MD8&M, in accordance with the Lake County Ordinance Code.

The Board of Supervisors finds that the establishment, maintenance or operation of the use for which application is made will not under the circumstances of this particular case be detrimental to the health, safety, peace, morals, comfort and general welfare of persons residing or working in the neighborhood of such use, or be detrimental to the general welfare of the County and that the proposed use is not a trival action with no significant impact on the environment.

The Planning Commission has caused to be prepared an Environmental Impact Report on the subject of this application and has held public hearings thereon and has carefully considered this matter pursuant to the California Environmental Quality Act and the State E.I.R. Guidelines pertaining thereto, and pursuant to the Environmental Protection Guidelines of the County of Lake.

1. Approval is subject to the following terms and conditions:

   1. The Use Permit shall be valid for a period of three (3) years from the date of approval; however, if the Use Permit is not used prior to February 19, 1983, it will become null and void, and the use may not proceed without the application for and approval of a new Use Permit. The Planning Commission may in its discretion approve time extensions.

   2. The County reserves the right to inspect this project at any time after first attempting to notify the operator.

   3. The Use Permit shall be reviewed by the Planning Commission at the end of eighteen (18) months and shall be subject to the following conditions:

   A. TO PROTECT PLANT ASSOCIATIONS:

      1. Specified pad, road, and borrow sites shall be evaluated by a qualified landscape architect, registered forester, plant ecologist or qualified person acceptable to the Planning Department and applicant, to determine which native plants should be replanted, which annual grasses shall be seeded and which non-native plants can be tolerantly sustained.

      2. Top soil shall be stockpiled for later respreading over the disturbed areas prior to re-seeding.

      3. When construction/drilling has been completed, revegation shall be programmed and shall commence in the fall following the construction. The revegetation program shall be directed by the landscape architect, registered forester, plant ecologist or other qualified person acceptable to the Planning Department and applicant.

      4. The entire revegetation program shall be re-evaluated during the spring following initial

planting and, if deemed by the Planning Department to be unsuccessful, additional regevetation will be required in the immediately succeeding fall season.

5. Except for large stumps, vegetation removed during construction shall be chipped and respread when beneficial as determined by person in Section A-1, or burned under the permits required by the Lake County Air Pollution Control District. Stumps may be buried outside of engineered fill and embankments.

6. In order to protect riparian and fen areas, as well as other vegetation on the leasehold, access to the drill-sites shall be restricted to existing roads and proposed roads as defined in the application.

7. Vegetation beyond the construction perimeter shall not be disturbed. The clearing limits for the pad shall be specified in the plans and specifications to be submitted for approval to the Planning Department.

B. TO PROTECT AGAINST EXCESSIVE SOIL EROSION, INDUCED LANDSLIDES AND SURFACE GEOLOGIC HAZARDS:

1. Plans for drill pads, steam transmission pipelines, sumps and access roads shall be prepared by a registered civil engineer with assistance from a registered engineering geologist. Topographic mapping by photogrammetric methods shall be used for design and be supplemented as necessary with ground surveys. Road, pipeline, and pad locations shall be staked on the ground and adjusted as necessary before completion of final plans. Plans shall include a separate drainage plan using five foot contour intervals and supporting calculations for culvert sizes using acceptable engineering methods. Plans shall show specific provisions for erosion protection along pipeline routes, at culverts and on cut and fill slopes. detailed specifications for construction should be prepared in a manner similar to applicable portions of "Forest Service General Provisions and Standard Specifications for Contruction of Roads and Bridges-1977" and "Regional Standard Specifications", a U.S.D.A. Forest Service. Plans, specifications and ground locations shall be approved by the Planning Department or their authorized representatives before starting construction, and shall also be approved by the Regional Water Quality Control Board prior to construction.

2. Drill pad and road fills shall be compacted to a minimum 90% relative compaction to minimize erosion. If significant erosion occurs as a result of any part of this project, applicant shall take prompt remedial action.

3. Filled slope banks shall not exceed a gradient of 2:1. Toes of all fills shall be stabilized with rock and gravel or keyed into stable soil and placed to reduce erosion potential to an absolute minimum on all fill slope banks. Revegetation of slopes shall be carried out as specified in Condition A. Unless approved by an engineering Geologist and Planning Department, cut slopes shall not exceed a gradient of 1½:1.

4. Subdrains shall be provided under all fills where natural drainage courses and seepage are evident.

5. No drill pad construction or access road shall be allowed on potentially active landslides, unless properly mitigated, subject to approval by the Planning Department.

6. Buffer zones of undisturbed vegetation shall be maintained 500 feet on either side of streams. No geothermal related construction shall take place within this buffer zone without specific approval from the Lake County Planning Commission. Roads crossing riparian areas shall be minimum safe widths.

7. A retaining levee of not less than eighteen (18) inches in height and three (3) feet in base thickness shall be placed on the perimeter of all fill areas including access road fills, pad site and reserve pit sites, to prevent storm runoff accumulation from random discharge.

8. Drainage plan to be submitted will distribute storm water runoff and channel it to existing natural waterways only to the extent that it will not increase water head to the point of unnatural channel abrasion. Energy dissipators and collection devices to reduce the erosion force of unnatural runoff will be required where determined by County or State Agency Representatives.

9. All grading activity shall be completed and all drainage structures shall be in place and operational prior to October 10 of any year. Grading and excavation activity may not be permitted during the consecutive period from October 10 to April 10. (It is understood that this is a general time frame. Extension beyond October 10 may be allowed by the Lake County Planning Director upon establishment of a suitable soil moisture specification for any stated activity).

10. Applicant shall agree to contract with the County of Lake for engineering and inspection services, as required, to a completion date agreed upon by the applicant and the County, to insure compliance with the above stated conditions. Such services shall be billed to the applicant and repayment by the applicant shall be deposited in the Lake County Geothermal Trust Fund.

11. In areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion.

C. ENVIRONMENTAL AND SAFETY PROTECTIONS:

1. The sump shall be designed by a registered civil engineer with assistance from a registered engineering geologist. Design of the sump fill shall be to a specification to withstand both static loads and dynamic loads (imposed by credible seismic events) with safety factors of 1.5 and 1.2 respectively. The sump shall be constructed of material compacted to minimum 95% relative compaction unless the Lake County Planning Director determines, based upon conclusive soil testing data, that a lesser compaction is adequate. The sump shall be lined with at least two feet of clay having a permeability not to exceed 1×10^{-6} cm./sec., or an equivalent impermeable membrane. Volume of the sump shall be sufficient to accommodate both the drilling mud and any reasonable amount of precipitation which could enter the sump.

2. The sump shall be operated in such a manner as to preclude overtopping of the sump. Three feet of free board shall be maintained at all times.

3. Applicant shall prepare a viable contingency plan for spills and emergency pumping of the sump in the event of a heavy, unexpected rainfall or if excessive geothermal fluids are encountered. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of construction.

4. Applicant shall prepare a viable contingency plan for emergencies due to breaks or unexpected deformation of the pipeline or its supports. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of testing or operations, and annually updated on anniversary of permits.

5. Prior to the removal of drilling equipment, sump fluids (both mud and supernatant liquids) shall be chemically analyzed, upon request from the Planning Department, for type and quatity of biologically sensitive materials, especially hazardous materials, heavy metals and acids. The chemical analysis shall be sent to the California Regional Water Quality Control Board and Lake County Planning Department for review. If said analysis does not indicate quantities in excess of allowable limits for either human or other important biological elements, especially those of the aquatic ecosystem, then sump materials shall be solidified, dried, mixed with native soil and buried. If hazardous or biologically sensitive materials are found, such materials shall be removed to a Class 2-1 or Class 1 disposal dump site as directed by the County or appropriate State Agency.

6. No hydrocarbon base cleaning agent, no waste oils or greases, and no liquid fuel shall intentionally be released directly onto the surface of a drill pad. All such liquids shall be contained and removed from the site. Any accidental discharge of the materials mentioned above shall be removed and properly disposed of by the applicant.

7. All unattended drilling equipment, well heads, sumps and ponds shall be protected from access by unauthorized persons by minimum 6 ft., locked, chain-link fencing.

8. Pipeline components which are exposed to ambient conditions at a temperature of 140 degrees fahrenheit or higher, where accessible to human reach, shall be designed to mitigate against inadvertent human burn injury.

9. Sanitary and hand washing vacilities shall be provided at the drill site and as specified by the Lake County Health Department.

10. In the event of casing blowout or other uncontrolled venting, the applicant shall move immediately to control the vent. No more than two (2) days shall elapse from the date of the uncontrolled vent to the date of equipment relocation to secure it.

11. Well discharge shall be directed away from adjacent woody vegetation and populated areas and appropriate energy dissipators shall be used as required by the Planning Department.

12. All solid waste material shall be removed from the site. Upon completion of drilling operations, unless otherwise approved by Planning Department, all equipment and materials unnecessary to the operation of the completed well shall be removed within sixty (60) days of completion of the well.

13. Applicant shall comply with the requirements of the fire prevention practices and measures as may be prescribed by the California Division of Forestry and/or County of Lake.

14. Provision shall be made for adequate sccess by fire-fighting equipment to the site, and fire access maps shall be provided to the appropriate Fire District (s).

15. Lights in the drilling rig shall be shielded so as to minimize visual impact at night to the portion of Bottlerock Road from which the drilling mast is visible.

16. Applicant shall provide the Planning Department with a plan which details the equipment and procedures which will be employed during powerplant outages (stacking periods) and during maintenance venting. This plan shall include proposed hours during which planned maintenance venting will occur as well as projected time which will elapse between unscheduled power plant outages and the throttling back of wells to minimum bleed. The plan shall include personnel available for unscheduled outages and projected response time of those personnel.

17. Applicant shall submit for the Planning Commission's approval a traffic control and road maintenance plan for High Valley Road. This plan shall take into account the great increase in heavy truck traffic which will accompany full field development of the Bottlerock site. The plan shall suggest mitigations which will prevent or alleviate the concomitant increase in danger due to traffic accidents and damage to the road which may occur following development.

18. Pipeline routes and design must be approved by the Planning Department prior to construction.

19. Prior to any construction activities, the applicant shall provide to the Planning Department for its approval a complete plan of development, showing locations of wells, pads, sanitary facilities, temporary and permanent storage and construction areas and buildings and the means by which these areas will be protected from unauthorized entry.

D. TO PROTECT AGAINST SURFACE WATER DEGRADATION:

1. In order to preserve the hydrologic integrity of this leasehold area applicant shall obtain by right or purchase all water used in drilling process or dust control.

2. The equipment service and fuel transfer areas and the area occupied by the drilling rig shall drain into the sump.

3. All fluids produced during testing after the sump has been filled shall be containerized and removed to a Class 1 or Class 2-1 disposal site, if required by the Planning Department or State Agencies.

4. The applicant shall continue to monitor the surface water quality of Kelsey and High Valley Creeks as required by the McCulloch Francisco Use Permit, and shall coordinate this water quality monitoring program with the ongoing California Department of Water Resources Water Quality Monitoring Program, said coordination being subject to approval by the Planning Department. Yearly microfaunal studies shall be initiated at times and locations specified in the McCulloch Department of Water Resources Bottlerock Steam Field EIR. Sampling procedures and parameters shall conform to those procedures and parameters outlined in the section entitled "monitoring", on pages 123 and 124 of that EIR.

5. If the applicant elects to conduct or participate in a larger and more comprehensive water quality program, it can be substituted for the requirements of D4. Such a proposal must be submitted to and accepted by the Planning Department and begun prior to the commencement of construction activities.

E. TO PROTECT AIR QUALITY:

1. Applicant shall meet all regulations and standards set

by the Lake County Air Pollution Control District and utilize on a continuous basis the state of the art of H_2S technology. This Use Permit does not supersede the authority of said District in any way.

2. After completion of geothermal wells, the H_2S emissions during standby venting of steam shall be either abated to acceptable level per Air Pollution Control District rules and regulations or standby venting shall be curtained to that level necessary to attain emission limitations. Curtailment methods to be utilized shall include the shutting in of geothermal wells as publicly agreed to by the applicant.

3. Applicant shall minimize vehicular dust on unpaved roads by the use of water or other acceptable dust retardant.

4. Applicant shall provide accurate chemical analysis of the geothermal resource if it is encountered, when required by the Air Pollution Control District.

5. The analysis shall include accurate "wet chemistry" and gas chromatograph determinations. Heavy metals such as lead, chromium, arsenic, antimony, mercury and cadmium should be determined as well as substances such as radon, hydrogen sulfide, boron, manganese, methane, fluoride, ammonia and carbon dioxide. The analysis should also include pH. The chemical analysis will be used in future use permit consideration for geothermal development on the project leasehold. The analysis shall be sent to the Planning Department within 45 days of completion of the well.

6. Applicant shall enter into agreements with Department of Water Resources or other parties as necessary and provide a written commitment and preliminary design of abatement systems as described in a letter dated February 15, 1980 from Ronald Robie, Director Department of Water Resources, to Lake County Air Pollution Control District which is acceptable to the Lake County Air Pollution Control District prior to all construction.

F. TO PROTECT AGAINST NOISE EXPOSURE:

1. Applicant shall meet a noise standard of Ldn 55 db (A) with a 10 db penalty between the hours of 10 P.M. and 7 A.M. of the following day at residences.

2. If measurements by the Planning Department indicate a possible violation of F.1, a measurement of the source noise in an appropriate location in the immediate vicinity of the source shall be made to determine if the source noise is sufficient to cause the level measured at F.1 to exceed 55 Ldn using the inverse square law. This source measurement shall be an equivalent sound level (Leq) averaged over a 24 hour period.

3. These regulations shall be adopted until a noise control ordinance is approved by the Board of Supervisors. Applicant agrees that the Planning Commission shall have the right to substitute the conditions of a General Noise Control Ordinance for the conditions of this section when adopted by the Board of Supervisors. It is understood by the Planning Commission and applicant that mufflers of advance design will be required for almost all geothermal operations in order to meet these standards and that extraordinary mitigative techniques such as lead/vinyl barriers and the wrapping of the drill rigs may be necessary to meet the noise standards of Section F-1 and F-2.

4. It is stipulated that the Lake County Planning Department will be spot monitoring noise levels in the vicinity of the proposed land use and that findings resulting from said monitoring may require the applicant, his contractors or agents to provide continuous noise level monitorings and readings as may be directed by the Planning Department.

5. It is also stipulated that the Planning Department has jurisdiction over noise investigation procedures and enforcement.

6. If the Planning Department receives noise complaints, the hours of heavy truck traffic to and from the site may be restricted to the hours between daylight and sunset only; except in cases of emergency.

7. Drill pipes shall not be laid in bins between the hours of 8 P.M. and 7 A.M. the following day.

G. TO PROTECT ARCHAEOLOGICAL RESOURCES:

1. Archaeological sites identified on pages 125-127 of the McCulloch Department of Water Resources Bottlerock Steamfield EIR shall be preserved in their existing state. No excavation or disturbance by the applicant or his contractors shall be permitted at these archaeological sites unless mitigated, subject to approval by the Planning Department and Sonoma State University's Resources Facility.

H. TO CONTROL VISUAL IMPACTS:

1. The revegetation program shall be formulated to include consideration of the visual impacts created by geothermal development.

2. Pipelines shall be colored in such a manner as to provide maximum color compatability with the vegetation type tyrough which it is routed. The choice of the color of the pipeline shall be made by the revegetation program contractor. Changes in color shall be made along the pipeline if necessary to blend with the background.

3. On visual edges such as ridgelines, low profile design approaches shall be employed.

4. All pad/road/pipeline sites shall be placed in areas, other environmental and engineering conditions being met, in such a manner that existing vegetation and topography will provide maximum screening.

I. UPON WELL ABANDONMENT:

1. The applicant shall abandon any well in accord with the Division of Oil and Gas Regulations.

2. Applicant shall refill sump and grade pad to reasonably restore a natural ground contour.

3. Applicant shall remove all pipelines and supports not necessary for field operation.

4. Applicant shall revegetate the pad and sump areas with woody vegetation that can be tolerantly sustained in accord with recommendations of the revegetation consultant or the procedure given in Condition A-1.

J. RE-ENTRY OF PRODUCTION OR SUSPENDED WELL BORES:

1. Applicant may re-drill or otherwise re-enter the same well bore of any well authorized under this Use Permit during the life of this project as long as all conditions of the Use Permit are met.

K. SEVERABILITY:

If any section, subsection, sentence, clause or phrase of this permit is for any reason held by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the remaining portions of the use permit. The Board of Supervisors hereby declares that it would have passed this use permit and each section, subsection, sentence, clause and phrase hereof irrespective of the fact that any one or more sections, subsections, clauses or phrases are declared invalid.

II. IN GRANTING THIS USE PERMIT, THE LAKE COUNTY BOARD OF SUPERVISORS MAKES THE FOLLOWING FINDINGS:

A. That this Use Permit does not abridge or supersede the regulatory powers or permit requirements of any State or Federal Agency or any Special District or other Lake County Department or Division which may retain an advisory or regulatory function as specified by statute or ordinance, nor does this Use Permit grant any title or other real property solely to this applicant or his assigns.

B. That the granting of this Use Permit is in the general public interest and that environmental and performance parameters conditioning the proposed activity as specified in this Use Permit and as contained in that document entitled "Conditions, Procedures and Performance for Geothermal Regulations, County of Lake" now referenced and made a part hereof, will allow the proposed activity with adequate safeguards to the welfare of the people of Lake County at large and to the people residing in the vicinity of said activity.

C. That this Use Permit shall be subject to revocation or modification by the Board of Supervisors of Lake County if:

1. The Board finds that there has been non-compliance with any of the foregoing conditions or:

2. The Board finds that the use for which this Use Permit is granted is so exercised as to be substantially detrimental to the general public or to property in the vicinity of the use.

Any such revocation shall be taken pursuant to Section 21-84 of the Ordinance Code of the County of Lake.

D. Noise levels from drilling operations will be muffled and times of other operations limited so as not to constitute a public nuisance.

III. THE BOARD OF SUPERVISORS FURTHER DECLARES THAT:

A. This Use Permit may be modified or revoked if the Lake County Board of Supervisors finds that the use to which this permit is put is detrimental to the health, safety, morals, comfort and general welfare of the persons residing or working in the neighborhood of such use, or

If it is injurious or detrimental to property and improvements in the neighborhood or the general welfare of the County, or is a nuisance.

Date of Issuance:

GEORGE R. VOLKER
Planning Director

By: _____
Irene L. Brown, Secretary

ACCEPTANCE

I have read and understand the foregoing Use Permit and agree to each and every term and condition thereof.

Date: _____

_____
Owner or Authorized Agent

DP;lds

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

September 2, 1980

Mr. James Hickey
Director
Napa County Conservation, Development
and Planning Department
1121 First Street
Napa, CA 94558

Dear Jim:

Based upon a suggestion made by Pranab Chakrawarti and Dan Garvin at the meeting you were unable to attend in June here in our office, the staff of the GRIPS Commission has reviewed individually each county's use permitting procedures for geothermal electric power development projects.

The Work Program for our Direct Heat Project (approved by D.O.E. as of August 1) also involves a review of the counties' policies and permitting processes. However, that review is related to development of geothermal direct heat applications; and we anticipate it will identify issues not touched in the enclosed review of your geothermal electric power development permit procedures.

When we meet with you, we will want to discuss how we can best integrate the information developed in the two studies. In the interim, you may want to consider identifying your present geothermal procedures as having application to power generation geothermal projects, and provide that direct heat proposals will be reviewed on a case-by-case basis pending development of a set of policies and guidelines specifically developed for direct heat permits.

In order to structure the evaluation, a list of criteria was drawn up that encompasses the most important elements of the permitting process. These criteria are as follows:

1. Time required for permit processing.
2. Relationship of permit processing to existing plans, policies and standards.
3. Completeness of conditions.
4. Clarity of conditions.
5. Structure of conditions for Planning Commission review.
6. Structure of conditions for application by the developer.
7. Usefulness of environmental impact information.
8. Usefulness of staff report.

Mr. James Hickey
September 2, 1980

The body of the report presents the overall conclusions reached as a result of an evaluation of each criterion. In addition, an Appendix has been prepared which provides a detailed evaluation of individual use permit conditions.

I hope you will find the information contained in the attached report useful. It has not been our intention to make this a definitive work. Rather, it is viewed as a survey of the existing situation which will serve as a basis for allowing us to work with the County's staff to improve the geothermal permitting processes.

This report has been developed as a part of a contract between the GRIPS Commission and the D.O.E. which has involved a review of county geothermal policies and procedures. We must submit a final report to D.O.E. in draft form by December 1, 1980, under the conditions of this contract. We are hopeful of getting together with you during late October in order to receive your input on the report and to develop a projection of what action may occur as a result of the preparation and submission of the report. Of particular interest would be a determination as to whether you feel that there is any way we can assist you in making your County's permitting process more effective.

If you wish to receive copies of the use permits or conditions used by any of the other counties, please give Bob Van Horn or Paula Blaydes a call.

Sincerely,

Douglas K. Caldow/seb

DOUGLAS K. CALDOW, AICP
Project Coordinator

DKC/seb:dr
Enclosure

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

ANALYSIS OF

NAPA COUNTY'S

GEOTHERMAL PERMITTING PROCEDURES

Prepared by

G.R.I.P.S. Commission

August 30, 1980

Geothermal Research, Information and Planning Services / A California Joint Powers Agency

Lake County
Mendocino County
Napa County
Sonoma County

INTRODUCTION

This report presents the overall conclusions reached as a result of the detailed evaluation of Napa County's geothermal permitting procedures. The evaluation consists of an analysis of eight criteria, and the overall conclusions that follow are presented under the headings of individual criteria. At the end of the report, in Appendix A, there is a detailed condition-by-condition analysis of a typical Napa County geothermal use permit, focusing primarily on the completeness of conditions and on clarity of expression.

It will be noted that many of the ideas expressed in this report apply only to deep exploratory and/or field development projects rather than shallow temperature probes. Sometimes this distinction is mentioned, and, at other times, it is not. It should not be inferred from this that the generally more stringent conditions applicable to the major drilling projects should be applied to heat probes as well. Rather, the range of conditions is being presented for consideration in appropriate situations.

1. Time Required for Permit Processing

Napa County has not processed any field development permits in the past. Attention to date has been focused on exploratory work, and several exploratory use permits have been issued. In the course of this evaluation, five Amax use permits were evaluated in terms of the time it took to issue them. The length of time required to process these permits ranged from slightly over 2 months to a maximum of 9½ months. In fact, four of the five permits were issued in under five months, although it should be noted that it was not necessary to prepare an Environmental Impact Report for any of these projects.

The final two use permits issued were processed under the provisions of AB 2644, in which the State Division of Oil and Gas (DOG) assumed lead agency status. Apparently, the County was able to work effectively with DOG since these two permits were issued fairly quickly; one in just over two months and one in four months. Obviously, the essential element in working jointly on permit processing is good communications. It would appear the County and DOG are doing a good job in this regard. Overall, the County has quite a good record in processing geothermal use permits expeditiously.

2. Relationship to Existing Plans, Policies and Standards

The Napa County General Plan is an amalgamation of General Plan Elements that have been prepared and adopted at various points in time. The basic land use element, adopted in December 1975, is entirely silent on the subject of geothermal development. However, the combined conservation and open space element, adopted by the Board of Supervisors in June 1973, in a section entitled "Managed Production of Resources", mentions geothermal in three policy statements. However, the plan's goals, policies and recommendations do not, by themselves, provide sufficient guidance for decision makers such as the Planning Commission to rely on in their daily work.

The General Plan does, however, appear to point the way in a limited manner for a course of action that could influence development decisions. One of the plan's policies states:

> "Prepare priority list identifying critical areas and features threatened by destruction and encourage their inclusion in a natural resource conservation and/or open space easement area which should include ("prohibition") of the following...mining, excavation, drilling, or otherwise exploring for minerals, geothermal, sand, gravel, or hydrocarbon resources..."

Conceivably, this priority list of critical areas and features would define those areas in which geothermal development would not be allowed. In this way, it would be applicable to a few of the daily decisions made by the Planning Staff and the Commission. An important consideration, with regard to the implementation of this policy, would be the effect such a prohibition could have on geothermal development for direct heat applications.

In terms of zoning, the County does not have a "geothermal development district" in its Zoning Ordinance. Instead, geothermal development is allowed by use permit in certain districts in accordance with the provisions of Ordinance No. 499 regarding Oil, Gas and Geothermal Resources. Actually, Ord. No. 499 does not establish the standards to which geothermal development projects must adhere. Instead, it specifies what sorts of plans and information must be submitted at the time application is made for a permit; it sets forth the findings that must be made by the Planning Commission before they can approve a permit; and it defines a series of administrative requirements that must be adhered to in terms of such matters as permit review procedures, extensions, inpsections, changes, emergencies, bonding and insurance.

The County has not adopted development standards or conditions that apply to all geothermal development use permits, such as Lake County has developed but not yet adopted (see Appendix C). Nor has a "comprehensive geothermal resource management program", similar to Sonoma County's proposed program, been formulated or proposed. (Sonoma County's proposed program includes the County General Plan; preparation of specific plans; initiation of a Geothermal Development zoning district; and development of a Master Environmental Assessment.) On the other hand, the County Planning Staff has shown interest in developing an Energy Element to the General Plan, and it may be that more detailed policies and programs could emerge from that, should such a project be initiated.

A geothermal management program already in effect in Imperial County started with the development of a Geothermal Element (rather than an Energy Element). Their management program includes a Geothermal Element, geothermal zoning district and a Master Environmental Assessment. The package seems to be working well for them according to reports from the County Planning Director and the Geothermal Coordinator. Moreover, the management program has enabled them to fulfill their desire to obtain lead agency status from DOG over exploratory projects. (Copies of Imperial County's Geothermal Element and zoning district are on file in the G.R.I.P.S. Commission's library, and can be made available for review if desired.)

3. Completeness of Conditions

This section of the report addresses whether Napa County's geothermal use permit conditions deal with all the topics of relevance as well as all of the aspects of each topic that are important. In addition, the question of redundant conditions and unnecessary conditions is also addressed, and some overall conclusions are drawn. While the overall conclusions are presented here in the body of the report, a very detailed item-by-item analysis of each condition, and comparing Napa County's conditions with conditions imposed by other KGRA counties, is contained in Appendix A.

Since the County does not have an established comprehensive set of conditions to draw upon, other than the listing of conditions contained in prior use permits, there is no guarantee that all of the conditions that are appropriate will be included on a current use permit. For example, a review of recent conditions applied on use permits when compared against conditions imposed by other KGRA counties raises the question as to whether it might also be useful to address the subjects of severability, modification and/or

revocation, fire protection, blowouts, site security, air quality, noise, road maintenance, sanitary and drinking water facilities, visual impact, re-entry, monitoring and inspection, and level of performance.

A similar type of problem concerns situations in which a subject is already addressed by one or more conditions, but where a particular aspect of the topic is not dealt with. For example, the County normally includes a number of conditions regarding water quality protection; however, there is no requirement, such as Lake County has, that a contingency plan be prepared for emergencies due to pipeline breaks. This type of omission may have been deliberate, or it may represent an approach that was not considered at the time the use permit was approved. In any event, the conditions found in use permits issued by other KGRA counties may suggest some approaches that Napa County may wish to incorporate in its use permits. Points for comparison are presented in Appendix A.

Although it is unquestionably more important to ensure that the conditions imposed are complete, the presence of unnecessary conditions can also have a deleterious effect in terms of the time spent preparing and reviewing the conditions, as well as in terms of the effect the document has in conveying an impression of being expertly conceived and authoritative. In Napa County's use permits there are one or two conditions, or parts of conditions, which might be unnecessary in that they deal in detail with standards that actually fall under the jurisdiction of the State Division of Oil and Gas. For example, the condition (Number 14 listed in Appendix B) dealing with completion of the holes in a manner as to prevent subsurface interzonal migration of water and surface leakage.

Perhaps the best way of avoiding these problems of completeness would be to create an ordinance or resolution establishing the basic conditions that will be required of all geothermal developers, and utilizing the most appropriate terminology for expressing those conditions.

The analysis of the conditions normally imposed by the County reveals that few are site-specific in nature. In other words, they could be applied to virtually any geothermal development at The Geysers. Therefore, it might be useful to embody a set of basic conditions in the form of an ordinance, or, for ease of amendment, a resolution that would be automatically applicable to each new development proposal. Clearly, additional site-specific conditions could be drawn up as well. Lake County has made an effort to create such a standardized set of conditions, and a copy of this is provided as Appendix C.

4. Clarity of Conditions

This section of the report evaluates the clarity with which use permit conditions are expressed. The conclusion with regard to Napa County's conditions is that, with one or two minor exceptions, they are expressed clearly. A detailed analysis of individual conditions is contained in the same Appendix which deals with the item-by-item evaluation of completeness.

5. Structure of Conditions for Planning Commission Review

There does not appear to be a clear and logical sequence to the conditions expressed in the typical use permit. For example, in the Amax Exploration, Inc. use permit reviewed as part of this evaluation, condition Number 2, which deals with completion of the hole, would

logically come toward the end of the conditions; instead, it is found near the beginning. Perhaps more importantly, there is nothing about the sequence of the conditions, and no topic headings, which would allow members of the Planning Commission to judge whether, in fact, all important consequences of the project had been considered in the conditions expressed.

The situation might be improved if a standard set of conditions was adopted containing headings for each of the environmental concerns and the administrative factors that are typically incorporated in use permit conditions. In this way, there would be less likelihood of inadvertent omission of an important condition. Logically, conditions dealing with the same topic would be grouped together instead of scattered throughout the permit, as is the case in the Amax use permit, in which completion of the hole is discussed in conditions Nos. 2, 11, 12, 13 and 14.

6. Structure of Conditions for Application by the Developer

Just as the conditions are not structured to assist the Planning Commission in their review of the permit, neither are the conditions structured to facilitate implementation by the developer. While the Planning Commission's responsibility is to ensure that each individual aspect of environmental impact is dealt with in the review of the proposed permit, the developer, once the permit is approved, views the conditions from a different perspective. For him, the conditions are most useful if they are structured in a manner that reflects the different construction phases. Perhaps this situation could be improved if, following approval by the Planning Commission, the conditions were re-ordered and new headings utilized, such as "Conditions Affecting Earth Movement" or "Conditions Relating to Abandonment of the Site".

7. Usefulness of Environmental Impact Information

In the past, the County has not required Amax to prepare an EIR on any of its exploration projects. Therefore, the Planning Commission undoubtedly relies very greatly on the Planning Department's staff for its input regarding the environmental impact of a project. The staff, in turn, derives its environmental impact information from a number of sources. The two most obvious sources are from the development plans and environmental analysis submitted along with the permit information, and from on-site inspection. On the basis of the data provided by these sources, the staff report is written, and appropriate conditions are selected for the use permit.

8. Usefulness of the Staff Report

The Department Report and Recommendation" presents the essential project information and staff analysis in a well-structured and concise manner.

APPENDIX A

This Appendix provides a detailed item-by-item evaluation of geothermal use permit conditions found in a typical Napa County use permit (U-617879), a copy of which is provided as Appendix B. On the basis of conditions already imposed by one or more KGRA counties, 25 individual topics were selected for evaluation to determine whether Napa County currently covers these topics (and covers all aspects of each topic), and whether the phraseology used in expressing each condition is clear.

The primary method of analysis has been to compare the completeness and clarity of Napa County's conditions with conditions used by the other three KGRA counties. Thus, conditions imposed by the other counties are often cited. The intent is not to suggest that the other counties necessarily handle a given topic better, and therefore, imply that Napa County should change its conditions. Rather, the intent is simply to point out an option that the County may or may not have previously considered, so that the County can itself make a reasonable choice based on more complete information.

As used herein "The County" shall refer to Napa County. And, the condition numbers cited in parentheses refer to the number of that condition in U-617879 contained in Appendix B.

1. Introductory Stipulations

The County's standard conditions (3 and 18) stipulating the maximum depth of each hole and specifying that, "Changes shall not be made in the work described in this permit...", are both useful introductory statements. The other KGRA counties have a number of introductory stipulations not covered by Napa County, and the County may wish to consider adding conditions similar to the following:

- Sonoma County's site-specific condition which states, "This permit is limited to the establishment of six drilling pads designated as well sites A, B-1, B-2, C, D, and E in the EIR, and the drilling of a total of six wells on said pads."
- Lake County's condition which states, "The granting of this use permit is in the general public interest and that environmental and performance parameters conditioning the proposed activity as specified in this use permit ... will allow the proposed activity with adequate safeguards to the welfare of the people of Lake County at large and the people residing in the vicinity of said activity."
- Lake County's condition which states, "The use permit shall be reviewed by the Planning Commission at the end of 18 months ..."
- A condition which states, "Approval of this permit in no way implies approval of any other future permits on this lease." Sonoma and Mendocino counties both have conditions similar to this.
- Mendocino County has another way of expressing this which may also be considered: "Permittee understands and agrees by acceptance of this limited permit that issuance of this permit in no way established a vested right or permission from permittee to further develop these geothermal sites despite any exploration expenses incurred by permittee in furtherance of this permit. Permittee further acknowledges that a full Environmental Impact Report will be required at some stage if further development permits are requested."

2. Term Use Permit Valid

The County's standard condition (1) in this regard states as follows:

> "The permit be in force and effect until April 18, 1980. The applicant may seek renewal. The operator shall begin the work within 60 days from the date of permit approval and shall notify the Conservation, Development and Planning Department at least 24 hours prior to commencement of work."

The first two sentences of this condition are appropriate and clearly stated; however, the County may wish to consider the requirements regarding beginning work within 60 days and notifying the Department 24 hours prior to the commencement of work if it finds these conditions are not very useful. It should be noted in this regard that none of the other three KGRA counties impose such conditions. With regard to the sentence indicating that the applicant may seek renewal, the County may wish to be somewhat more specific in a manner similar to Sonoma County, which states, "... that one extension of time up to one year may be granted pursuant to the provisions of Section 26-207.1 of the Sonoma County Zoning Ordinance."

3. Severability

Napa County has no standard severability clause. The County may wish to consider adopting a severability clause similar to Sonoma County's which states:

> "All conditions of this use permit are necessary to protect the general health, safety, and welfare, and to minimize or eliminate adverse environmental effects of the project. If any condition to this permit is held invalid by a court, then the entire permit shall be invalid by a court, then the entire

permit shall be invalid. The Board of Supervisors specifically declares that it would not have issued this permit unless all of the above conditions are attached."

This approach would give the County a chance to review the situation created by the loss of part of the permit through court action. However, it should be noted that Lake County's severability clause has taken the opposite approach, by stating:

"If any section, subsection, sentence, clause or phrase of this permit is for any reason held by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the remaining portions of the use permit. The Board of Supervisors hereby declares that it would have passed this use permit and each section, subsection, sentence, clause and phrase hereof, irrespective of the fact that any one or more sections, subsections clauses or phrases are declared invalid."

4. Modification and/or Revocation

Napa County has no standard clauses covering modification and revocation. The County may wish to consider adopting a condition similar to Sonoma County's, which states:

"This permit shall be subject to revocation or modification by the Board of Zoning Adjustment if: (a) The Board finds that there has been noncompliance with any of the foregoing conditions, or (b) The Board finds that the use for which this permit is hereby granted is so exercised as to be substantially detrimental to persons or property in the neighborhood of the use. Any such revocations shall be preceeded by a public hearing notice and heard pursuant to Section 26-225 of the Sonoma County Code."

5. Compliance with Other Laws and Regulations

The County's standard conditions (20 and 21) which refer to compliance with the regulations of the Division of Oil and Gas and

compliance with all applicable building codes, zoning standards and other requirements of other County departments and agencies, are appropriate and clearly stated. The County may wish to consider extending the reference to State departments to include the Regional Water Quality Control Board, the State Department of Forestry, and the County may also wish to make specific reference to the Regional Air Pollution Control District. Moreover, the County may wish to consider the addition of a phrase similar to one utilized by Sonoma County, which would state,

> "Any violation or noncompliance as to any provision of federal, state and local laws, ordinances, or regulations shall constitute a violation of this use permit."

6. Archaeology

The County's standard condition (15) appears appropriate and clearly worded. In those instances in which an EIR has been prepared, the County may wish to consider the addition of a sentence, similar to Sonoma County's which states, "Mitigations recommended in the EIR to protect the archaeological resources shall be followed."

7. Fire Protection

The County has no standard fire protection condition. Consideration might be given to adopting standardized conditions suggested by the three Department of Forestry District Rangers whose jurisdiction encompasses The Geysers. The suggested conditions are as follows:

> "The applicant shall comply with the requirements of fire prevention practices and measures as prescribed by the Department of Forestry, and shall file with the Department of Forestry a Fire Prevention and Protection Plan.

Provisions shall be made for adequate access by fire-fighting equipment to the site and fire access maps shall be provided to the appropriate fire services.

Prior to any work proceeding relative to this use permit, the parent company must advise the fire service agencies having jurisdiction."

8. Blowouts

Napa County does not have a condition regarding well blowouts. Lake County's is as follows,

"In the event of casing blowout or other uncontrolled venting, the applicant shall move immediately to controlled vent. No more than two days shall elapse from the date of the uncontrolled vent to the date of the equipment relocation to secure it."

9. Site Security

The County does not have any standard site security condition. Consideration might be given to the adoption of a condition similar to Sonoma County's,

"All unattended drilling equipment, wellheads, sumps, ponds and other hazardous equipment or facilities, shall be protected from access by unauthorized persons."

On the other hand, Lake County has a similar provision to Sonoma County's but requires that protection will be achieved by,

"... a minimum 6-foot locked, chain-link fencing."

10. Access to Site and Limits on Area of Construction Activity

The County's standard condition (22) concerning this topic is quite specific in its form, which is probably appropriate in situations involving heat probes. On the other hand, Sonoma County's standard condition which seems to work for them for larger projects, states,

> "The boundaries of the designated drilling pad and access road right-of-way shall be clearly marked, and no construction or transport equipment shall be permitted beyond the prescribed boundaries of said pad and road right-of-way."

11. Air Quality

The County has no standard air quality condition. In cases involving deep exploratory wells or, field development wells, the County may wish to consider adding conditions similar to Sonoma County's which state,

> "Prior to commencement of any excavation of any road, well site construction, or drilling, an Authority to Construct shall be obtained from the Northern Sonoma County Air Pollution Control Officer.
>
> Construction and operation of these wells shall not cause any federal or applicable state ambient air quality standard to be exceeded or to be in violation of any district rule or regulation."

On the other hand, in cases involving field development, the County may wish to go still further and adopt conditions similar to those utilized by Lake County, which states

"TO PROTECT AIR QUALITY:

1. Applicant shall meet all regulations and standards set by the Lake County Air Pollution Control District and utilize on a continuous basis the state of the art of H_2S technology. This Use Permit does not supersede the authority of said District in any way.

2. After completion of geothermal wells, the H_2S emissions during standby venting of steam shall be either abated to acceptable level per Air Pollution Control District rules and regulations or standby venting shall be curtained to that level necessary to attain emission limitations. Curtailment methods to be utilized shall include the shutting in of geothermal wells as publicly agreed to by the applicant.

3. Applicant shall minimize vehicular dust on unpaved roads by the use of water or other acceptable dust retardant.

4. Applicant shall provide accurate chemical analysis of the geothermal resource if it is encountered, when required by the Air Pollution Control District.

5. The analysis shall include accurate "wet chemistry" and gas chromatograph determinations. heavy metals such as lead, chromium, arsenic, antimony, mercury and cadmium should be determined as well as substances such as radon, hydrogen sulfide, boron, manganese, methane fluoride, ammonia and carbon dioxide. The analysis should also include pH. The chemical analysis will be used in future use permit consideration for geothermal development on the project leasehold. The analysis shall be sent to the Planning Department within 45 days of completion of the well.

6. Applicant shall enter into agreements with Department of Water Resources or other parties as necessary and provide a written commitment and preliminary design of abatement systems as described in a letter dated February 15, 1980, from Ronald Robie, Director Department of Water Resources, to Lake County Air Pollution Control District which is acceptable to the Lake County Air Pollution Control District prior to all construction.

16. Applicant shall provide the Planning Department with a plan which details the equipment and procedures which will be employed during powerplant outages (stacking periods) and during maintenance venting. This plan shall include proposed hours during which planned maintenance venting will occur as well as projected time which will elapse between unscheduled powerplant outages and the throttling back of wells to minimum bleed. The plan shall include personnel available for unscheduled outages and projected response time of those personnel."

12. Water Quality

With reference to the condition (7) which requires that,

> "No activities be undertaken in the area of any live stream, spring or seep on the property, .."

The reference to "in the area" is quite vague. As another way to handle this, consideration might be given to identifying the adverse impacts of development in the immediate vicinity of streams and springs, and then on a case-by-case basis determining the appropriate mitigation measures.

The first phrase of the County's condition (10) which states, "All drilling fluid is to be recirculated ...," is probably unnecessary. In addition, the clause in this same condition that requires that waste materials be hauled off the site or be "properly disposed of on-site" appears to be quite vague. The questions would quite naturally arise as to who determines what "properly disposed of" means.

At least in cases involving deep exploratory wells or field development wells, the County may wish to consider the adoption of conditions similar to Sonoma County's which state,

"Prior to issuance of any building or grading permit, an application for waste discharge requirements shall be submitted to the North Coast Regional Water Quality Control Board.

Drainage improvements shall be designed by a civil engineer in accordance with the Water Agency's flood control design criteria for approval by the chief engineer of the Sonoma County Agency and shall be shown on the improvement plans."

Again, in applications for deep exploratory wells or field development, the County may wish to consider more detailed conditions, such as those imposed by Lake County, which state:

"TO PROTECT AGAINST SURFACE WATER DEGRADATION:

1. In order to preserve the hydrologic integrity of this leasehold area, applicant shall obtain by right or purchase all water used in drilling process or dust control.
2. The equipment service and fuel transfer areas and the area occupied by the drilling rig shall drain into the sump.
3. All fluids produced during testing after the sump has been filled shall be containerized and removed to a Class 1 or Class 2-1 disposal site, if required by the Planning Department or State Agencies.
6. No hydrocarbon base cleaning agent, no waste oils or greases, and no liquid fuel shall intentionally be released directly onto the surface of a drill pad. All such liquids shall be contained and removed from the site. Any accidental discharge of the materials mentioned above shall be removed and properly disposed of by the applicant.

ENVIRONMENTAL AND SAFETY PROTECTIONS:

3. Applicant shall prepare a viable contingency plan for spills and emergency pumping of the sump in the event of a heavy, unexpected rainfall or if excessive geothermal fluids are encountered. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of construction.

4. Applicant shall prepare a viable contingency plan for emergencies due to breaks or unexpected deformation of the pipeline or its supports. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of testing or operations, and annually updated on anniversary of permits."

13. Erosion

The County's standard condition (9) which states, "Drilling operations and other uses of heavy equipment to be prohibited during the rainy season", is probably vaguer than is desirable in defining when the rainy season occurs. To avoid this problem of vagueness, without going to the other extreme of setting arbitrary dates, the County might give some consideration to identifying the adverse impacts of development in wet weather, and then on a case-by-case basis, depending on local conditions of soil types, slope, vegetative cover, etc., determining the appropriate controls.

With regard to the question of erosion, Lake County has devised a rather complete set of conditions that are quite specific, and Napa County may wish to consider the adoption of one or more of

these conditions at least for deep exploratory wells and field development wells. Lake County's conditions are as follows:

"TO PROTECT AGIANST EXCESSIVE SOIL EROSION, INDUCED LANDSLIDES AND SURFACE GEOLOGIC HAZARDS:

1. Plans for drill pads, steam transmission pipelines, sumps and access roads shall be prepared by a registered civil engineer with assistance from a registered engineering geologist. Topographic mapping by photogrammetric methods shall be used for design and be supplemented as necessary with ground surveys. Road, pipeline, and pad locations shall be staked on the ground and adjusted as necessary before completion of final plans. Plans shall include a separate drainage plan using five-foot contour intervals and supporting calculations for culvert sizes using acceptable engineering methods. Plans shall show specific provisions for erosion protection along pipeline routes, at culverts and on cut and fill slopes. Detailed specifications for construction should be prepared in a manner similar to applicable portions of "Forest Service General Provisions and Standard Specifications for Construction of Roads and Bridges - 1977" and "Regional Standard Specification", a U.S.D.A. Forest Service. Plans, specifications and ground locations shall be approved by the Planning Department or their authorized representatives before starting construction, and shall also be approved by the Regional Water Quality Control Board prior to construction.

2. Drill pad and road fills shall be compacted to a minimum 90% relative compaction to minimize erosion. If significant erosion occurs as a result of any part of this project, applicant shall take prompt remedial action.

3. Filled slope banks shall not exceed a gradient of 2:1. Toes of all fills shall be stabilized with rock and gravel or keyed into stable soil and placed to reduce erosion potential to an absolute minimum on all fill slope banks. Revegetation of slopes shall be carried out as specified in Condition A. Unless approved by an engineering Geologist and Planning Department, cut slopes shall not exceed a gradient of 1½:1.

4. Subdrains shall be provided under all fills where natural drainage courses and seepage are evident.

5. No drill pad construction or access road shall be allowed on potentially active landslides, unless properly mitigated, subject to approval by the Planning Department.

6. Buffer zones of undisturbed vegetation shall be maintained 500 feet on either side of streams. No geothermal related construction shall take place within this buffer zone without specific approval from the Lake County Planning Commission. Roads crossing riparian areas shall be minimum safe widths.

7. A retaining levee of not less than eighteen (18) inches in height and three (3) feet in base thickness shall be placed on the perimeter of all fill areas including access road fills, pad site and reserve pit sites, to prevent storm runoff accumulation from random discharge.

8. Drainage plan to be submitted will distribute storm water runoff and channel it to existing natural waterways only to the extent that it will not increase water head to the point of unnatural channel abrasion. Energy dissipators and collection devices to reduce the erosion force of unnatural runoff will be required where determined by County or State Agency Representatives.

9. All grading activity shall be completed and all drainage structures shall be in place and operational prior to October 10 of any year. Grading and excavation activity may not be permitted during the consecutive period from October 10 to April 10. (It is understood that this is a general time frame. Extension beyond October 10 may be allowed by the Lake County Planning Director upon establishment of a suitable soil mositure specification for any stated activity).

10. Applicant shall agree to contract with the County of Lake for engineering and inspection services, as required, to a completion date agreed upon by the applicant and the County, to insure compliance with the above stated conditions. Such services shall be billed to the applicant and repayment by the applicant shall be deposited in the Lake County Geothermal Trust Fund.

11. In areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion."

Finally, the County may wish to consider the adoption of a condition similar to Sonoma County's which stipulates that, "All areas which are reseeded or refrosted shall be protected from grazing animals."

14. Noise

The County has no standard noise condition. Consideration might be given to the adoption of noise conditions similar to Lake County's which state:

"D. Noise levels from drilling operations will be muffled and time of other operations limited so as not to constitute a public nuisance.

F. TO PROTECT AGAINST NOISE EXPOSURE:

1. Applicant shall meet a noise standard of Ldn 55 db (A) with a 10 db penalty between the hours of 10 P.M. and 7 A.M. of the following day at residences.

2. If measurements by the Planning Department indicate a possible violation of F.1, a measurement of the source noise in an appropriate location in the immediate vicinity of the source shall be made to determine if the source noise is sufficient to cause the level measured at F.1 to exceed 55 Ldn using the inverse square law. This source measurement shall be an equivalent sound level (leq) averaged over a 24 hour period.

3. These regulations shall be adopted until a noise control ordinance is approved by the Board of Supervisors. Applicant agrees that the Planning Commission shall have the right to substitute the conditions of a General Noise Control Ordinance for the conditions of this section when adopted by the Board of Supervisors. It is understood by the Planning Commission and applicant that mufflers of advance design will be required for almost all geothermal operations in order to meet these standards and that extraordinary mitigative techniques such as lead/vinyl barriers and the wrapping of the drill rigs may be necessary to meet the noise standards of Section F-1 and F-2.

4. It is stipulated that the Lake County Planning Department will be spot monitoring noise levels in the vicinity of the proposed land use and that findings resulting from said monitoring may require the applicant, his contractors or agents to provide continuous noise level monitorings and readings as may be directed by the Planning Department.

5. It is also stipulated that the Planning Department has jurisdiction over noise investigation procedures and enforcement.

6. If the Planning Department receives noise complaints, the hours of heavy truck traffic to and from the site may be restricted to the hours between daylight and sunset only; except in cases of emergency.

7. Drill pipes shall not be laid in bins between the hours of 8 P.M. and 7 A.M. the following day.

15. Road Maintenance

Napa County does not, at the present time, have a condition regarding road maintenance. For use permits issued on field development projects, in particular, and perhaps also on deep exploratory wells,

the County may wish to consider the adoption of a condition similar to one used by Lake County. Lake County's condition states as follows:

> "Applicant shall submit for the Planning Commission's approval a traffic control and road maintenance plan for High Valley Road. This plan shall taken into account the great increase in heavy truck traffic which will accompany full-field development of the Bottle Rock site. The plan shall suggest mitigations which will prevent or alleviate the concomitant increase in danger due to traffic accidents and damage to the road which may occur following development."

In addition, consideration might also be given to the impact of road maintenance on erosion and siltation.

16. Flora and Fauna

The standard County conditions (5 and 23) seem to be appropriate although they might be located in closer proximity to each other. Another condition imposed by Lake County might also be applicable. This condition states, "Well discharge shall be directed away from adjacent woody vegetation and populated areas and appropriate energy dissipators shall be used as required by the Planning Department."

None of the four KGRA counties utilizes a standard condition regarding fauna protection.

17. Sanitary and Drinking Water Facilities

The County has no standard sanitary and water facilities condition. Consideration might be given to the adoption of a condition similar to Sonoma County's which states,

"Sanitary and hand washing facilities and a drinking water source satisfactory to the Public Health Officer shall be provided at the drill site."

18. Visual Impact

Napa County has no standard clause on visual impacts. The County may wish to consider adopting a set of conditions in this regard such as those utilized by Lake County. The

"TO CONTROL VISUAL IMPACTS:

1. The revegetion program shall be formulated to include consideration of the visual impacts created by geothermal development.
2. Pipelines shall be colored in such a manner as to provide maximum color compatability with the vegetation type through which it is routed. The choice of the color of the pipeline shall be made by the revegetation program contractor. Changes in color shall be made along the pipeline if necessary to blend with the background.
3. On visual edges such as ridgelines, low profile design approaches shall be employed.
4. All pad/road/pipeline sites shall be placed in areas, other environmental and engineering conditions being met, in such a manner that existing vegetation and topography will provide maximum screening.

15. Lights in the drilling rig shall be shielded so as to minimize visual impact at night to the portion of Bottlerock Road from which the drilling mast is visible."

19. Bonding

The standard Napa County condition (16) in this regard seems to be appropriate and clearly stated; however, the amount of bond is higher than required in Sonoma County. Some of the other provisions

of Sonoma County's bonding condition might also be of interest to the County and, therefore, their condition is presented here:

> "Prior to any construction or drilling, the applicant shall post a bond for each well authorized under this use permit to assure faithful performance of conditions of the permit. The bond is to be made payable to the County of Sonoma in the amount of not less than $10,000, of which $3,000 shall be cash. The cash bond of $3,000 may be in the form of certificates of deposit or similar guarantees of cash payment to the County, which guarantees cannot be revoked, withdrawn or cancelled by the applicant without approval of the Board of Supervisors. Requests by the County for payments from the cash bond fund shall be in the form of a resolution adopted by the Board of Supervisors. The Board of Supervisors may authorize a cash bond, in whole or part, to be replaced by a surety bond in the same amount, when the Planning Director determines and recommends to the Board of Supervisors that the conditions of this use permit have been satisfied to the extent that a surety bond would adequately protect the County. The aforesaid performance bond or bonds for any single lease block shall not exceed a total amount of $50,000, of which not to exceed $15,000 may be cash."

20. Insurance

The standard Napa County insurance provision (17) seems to be adequate; however, it should be noted that the County is the only one of the KGRA counties to impose this requirement.

21. Liability

The County's standard liability condition (19) seems to be adequate and clearly expressed; however, here again it should be noted Napa County is the only KGRA county to impose such a condition.

22. Re-Entry

Napa County has no standard re-entry condition. The County may wish to consider a condition which states as follows:

> "Upon approval of the Planning Director, applicant may re-drill or otherwise re-enter the same well bore of any well authorized under this use permit during the life of this project as long as all conditions of the use permit are met, and so long as circumstances bearing on the project have not materially altered."

This condition is based on one used by Lake County although it is stronger with regard to changes in circumstances surrounding the project.

23. Completion and/or Abandonment

The County's standard conditions (2, 12, 13 and 14) seem appropriate and are clearly expressed. In addition to these standard conditions, the County may wish to consider adoption of a condition limiting the time for removal of equipment, such as Sonoma County's, which states:

> "After cessation of drilling, all drilling equipment and excess materials shall be removed from the site within 30 days, including any residue from drilling, except that the Planning Director, for good cause, may extend the time for compliance beyond 30 days."

Although there may be some question as to whether the data is proprietary, the County may wish to consider an additional condition similar to Mendocino County's, which states, "These use permits are granted on the condition that the applicant reports to the County Planning Department by May 24, 1978, about the significance of the temperature gradient measured."

24. Monitoring and Inspection

The County has no standard condition in this regard. The County may wish to consider a set of conditions similar to those imposed by Sonoma County, which state as follows:

> "The applicant shall fully reimburse County for all costs incurred by the County in inspecting and monitoring compliance with conditions of this permit and County Ordinances. The applicant shall reimburse County within 30 days after County sends its bill to applicant for costs incurred.
>
> The applicant shall grant unrestricted access of his property to County representatives or to consultants or contractors hired by the County for inspection, enforcement, or monitoring activities deemed desirable by the County; the applicant shall designate an individual who is to be available at all times for purposes of supplying information and responses as deemed necessary by authorized County representatives in connection with such work.
>
> The design engineer contracted to perform the engineering geology and site design shall be responsible for the inspection of all construction procedures involving grading, compaction, drainage improvements, and site revegetation.
>
> Applicant shall participate in any ambient air and/or water monitoring program required by the County or any of the aforementioned agencies; provided that the cost to the applicant of such participation shall be limited to $5,000 for each well and the monitoring program is commenced within 3 years after the spud in date of each well. The County will avoid the duplication of monitoring activities of other agencies."

25. Level of Performance

The County has no standard condition in this regard. Napa County may wish to consider the adoption of conditions similar to those

used by Sonoma County. The first condition presented here has been reworded slightly to make it more clear.

> "The Planning Director shall have the authority to require the applicant to eliminate, reduce, or otherwise control well emissions, and to reduce all other adverse effects that cannot be eliminated or adequately controlled. Such authority shall extend to cover regulations imposed by any other public agency or agencies having permit authority over emission levels. Adverse effects include, but are not limited to, the effect of noise and odor on persons, property, wildlife or vegetation in the vicinity of the wells. The applicant agrees to comply with any reasonable requirements of the Planning Director to eliminate, reduce, or control said adverse effects.
>
> The establishment of the pad, and the drilling and operations of the wells, shall follow the appropriate mitigation measures as recommended on pages 3, 26... inclusive of the final EIR for the project, and as required by the Planning Director. All activities pursuant to this use permit shall be conducted in such a manner as to prevent or minimize adverse environmental impacts. All equipment and techniques applied to the mitigation of noise and well emissions or discharges shall perform to a level equal to, or better than, any other existing method.
>
> The design engineer shall certify to the County of Sonoma that the project has been completed according to the approved engineering plans, and the conditions attached to any and all permits issued for the purpose of geothermal development, County of Sonoma."

APPENDIX B

U-617879

CONDITIONS OF APPROVAL

1. The permit be in force and effect until April 18, 1980. The applicant may seek renewal. The operator shall being the work within sixty (60) days from the date of permit approval and shall notify the Conservation, Development and Planning Department at least twenty-four (24) hours prior to commencement of work.

2. The applicant shall give notice of completion of Geothermal Resources Exploration operations submitted in duplicate and containing the following information for each hole drilled:

   a. Final hole designation and location.

   b. A driller's log noting water table and water aquifers encountered (if determined) and salt, coal beds or other mineral deposits, if present.

   c. Method of completion, cementing and casting and/or tubing used.

   d. Complete details of abandonment procedures.

   e. Any information on drilling difficulties or unusual circumstances of operations or protection of the environment in the area concerned.

3. The maximum depth of each temperature gradient hole be 152 meters (500) feet).

4. Grading, in addition to that outlined in #22 be prohibited.

5. Vegetation removal, in addition to that outlined in #22 be prohibited.

6. An area of 15 x 15 meters (50 x 50 feet) to be demarcated by stakes at both drill sites. All equipment movement, storage, and drilling activities to be limited to that area.

7. No activities to be undertaken in the area of any live stream, spring or seep on the property.

8. No vehicular operations outside of the boundaries of the improved roads and staked areas of operation.

9. Drilling operations and other uses of heavy equipment to be prohibited during the rainy season.

10. All drilling fluid is to be recirculated and the portable slush pits and drill cuttings are to be hauled off the site or properly disposed of on-site in a manner which will preclude any adverse environmental effects.

11. Drilling fluids or cuttings shall not be discharged on to the surface where such discharge will contaminate lakes and perennial or intermittent streams. Excavated pits or sumps used in drilling will be backfilled as soon as practicable and restored to conform with the original topography.

12. All clean-up operations will include the following:

    a. All trash, including cans, bottles, sacks and other paper products will be picked up and removed before the rig leaves the hold locations;

    b. No drilling fluids will be allowed to escape from the drill site area;

13. Holes shall be completed for observation purposes in a manner which shall allow satisfactory subsequent abandonment.

14. Holes shall be abandoned in a manner that will prevent subsurface interzonal migration of fluids and surface leakage.

15. When American antiquities or other objects of historic or scientific interest including but not limited to historic or prehistoric ruins, fossils, or artifacts are discovered in the performances of the permit, the item(s) or condition(s) will be left intact and immediately brought to the attention of the Director.

16. Bond The operator under this permit shall furnish the County with an indemnity bond in the amount of $20,000 for each hole drilled or a blanket bond in the amount of $350,000. The operator shall abate any public nuisance and adverse effect on public health, safety or welfare caused by the project and return site as nearly as possible to its original state. The Bond will indemnify the County for any costs incurred by the County in repairing any drill or test facility site, as nearly as possible to its original state and in abating any public nuisance caused by an operator's exploratory or testing operations.

17. Insurance Before commencing the project, the permittee shall show continuing evidence of insurance against liability in tort in a minimum amount of $1,000,000 arising from the exploration and testing actvities or operations incidental thereto conducted or carried on under or by virtue of any law or ordinance. Such insurance shall be kept in full force and effect during theperiod of such operations.

18. Changes shall not be made in the work described in this permit, whether in relation to location, dimensions, materials or character of the work without written authorization of the Commission, except in case of an emergency.

19. Neither the issuance of this use permit nor compliance with the conditions thereof shall relieve an operator from any responsibility otherwise imposed by law for damage to persons or property; nor shall the issuance of this use permit hereunder serve to impose any liability upon the County of Napa, its officers or employees, for injury or damage to persons or property. This use permit shall not relieve the operator of the responsibility of securing and complying with Napa County Ordinance #499 or any other permit which may be required by other County Ordinances, regional directives or state or federal laws.

20. Compliance with all applicable regulations of the State Resources Agency, Department of Conservation, Division of Oil and Gas.

21. Compliance with all applicable building codes, zoning standards and requirements of various County departments and agencies.

22. Access to the sites within Bear Valley to be via Van Ness Creek Road which may be improved as follows:

    a.- No more than 30 meters (100 feet) of brush clearance laterally along the shoulder of the road where it is contiguous to the creek.

    b. No mature forest trees to be removed or damaged.

    c. Road extension from end of existing Van Ness Creek Road to drill site to consist of corridor across the meadow whose boundaries shall be three (3) meters (10 feet) apart and marked by stakes and whose length shall be approximately 500 meters (1,600 feet).

d. Temporary culverts on Van Ness Creek or its tributaries to minimize earth movement within channel. Culverts to be removed at end of probe observation study. Drainage channel to be returned to original condition and culverts to be removed from site.

e. Minor grading of existing road to facilitate truck movement through areas of currently eroded road bed or removal of material resulting from soil slumpage. All spoils to be distributed along the length of the existing road and compacted by use of the road.

f. No vehicular operations outside of the boundaries of the improved Van Ness Creek Road, meadow corridor, and staked area of operation.

23. Site #45 be relocated away from threatened plants in accordance with a recommendation by the applicant's Environmental Consultant (Ecoview).

COUNTY OF LAKE

USE PERMIT

McCULLOCH BOTTLEROCK STEAMFIELD GEOTHERMAL PROJECT

Pursuant to the approval of the Lake County Board of Supervisors on February 19, 1980, there is hereby granted to McCulloch Geothermal Inc., 10880 Wilshire Boulevard, Los Angeles, CA., a Use Permit for the Cobb Valley area, for a maximum of ten additional wells to be drilled on three pads, the existing Francisco, existing Coleman and proposed Pad #3 as identified in the Final E.I.R., and for accessory access roads and pipelines, including three injection wells to be located in Sections 5 and 6 T11n., R8W, MDB&M, in accordance with the Lake County Ordinance Code.

The Board of Supervisors finds that the establishment, maintenance or operation of the use for which application is made will not under the circumstances of this particular case be detrimental to the health, safety, peace, morals, comfort and general welfare of persons residing or working in the neighborhood of such use, or be detrimental to the general welfare of the County and that the proposed use is not a trival action with no significant impact on the environment.

The Planning Commission has caused to be prepared an Environmental Impact Report on the subject of this application and has held public hearings thereon and has carefully considered this matter pursuant to the California Environmental Quality Act and the State E.I.R. Guidelines pertaining thereto, and pursuant to the Environmental Protection Guidelines of the County of Lake.

1. Approval is subject to the following terms and conditions:

1. The Use Permit shall be valid for a period of three (3) years from the date of approval; however, if the Use Permit is not used prior to February 19, 1983, it will become null and void, and the use may not proceed without the application for and approval of a new Use Permit. The Planning Commission may in its discretion approve time extensions.

2. The County reserves the right to inspect this project at any time after first attempting to notify the operator.

3. The Use Permit shall be reviewed by the Planning Commission at the end of eighteen (18) months and shall be subject to the following conditions:

A. TO PROTECT PLANT ASSOCIATIONS:

1. Specified pad, road, and borrow sites shall be evaluated by a qualified landscape architect, registered forester, plant ecologist or qualified person acceptable to the Planning Department and applicant, to determine which native plants should be replanted, which annual grasses shall be seeded and which non-native plants can be tolerantly sustained.

2. Top soil shall be stockpiled for later respreading over the disturbed areas prior to re-seeding.

3. When construction/drilling has been completed, revegation shall be programmed and shall commence in the fall following the construction. The revegetation program shall be directed by the landscape architect, registered forester, plant ecologist or other qualified person acceptable to the Planning Department and applicant.

4. The entire revegetation program shall be re-evaluated during the spring following initial

planting and, if deemed by the Planning Department to be unsuccessful, additional regevetation will be required in the immediately succeeding fall season.

5. Except for large stumps, vegetation removed during construction shall be chipped and respread when beneficial as determined by person in Section A-1, or burned under the permits required by the Lake County Air Pollution Control District. Stumps may be buried outside of engineered fill and embankments.

6. In order to protect riparian and fen areas, as well as other vegetation on the leasehold, access to the drillsites shall be restricted to existing roads and proposed roads as defined in the application.

7. Vegetation beyond the construction perimeter shall not be disturbed. The clearing limits for the pad shall be specified in the plans and specifications to be submitted for approval to the Planning Department.

B. TO PROTECT AGAINST EXCESSIVE SOIL EROSION, INDUCED LANDSLIDES AND SURFACE GEOLOGIC HAZARDS:

1. Plans for drill pads, steam transmission pipelines, sumps and access roads shall be prepared by a registered civil engineer with assistance from a registered engineering geologist. Topographic mapping by photogrammetric methods shall be used for design and be supplemented as necessary with ground surveys. Road, pipeline, and pad locations shall be staked on the ground and adjusted as necessary before completion of final plans. Plans shall include a separate drainage plan using five foot contour intervals and supporting calculations for culvert sizes using acceptable engineering methods. Plans shall show specific provisions for erosion protection along pipeline routes, at culverts and on cut and fill slopes. detailed specifications for construction should be prepared in a manner similar to applicable portions of "Forest Service General Provisions and Standard Specifications for Contruction of Roads and Bridges-1977" and "Regional Standard Specifications", a U.S.D.A. Forest Service. Plans, specifications and ground locations shall be approved by the Planning Department or their authorized representatives before starting construction, and shall also be approved by the Regional Water Quality Control Board prior to construction.

2. Drill pad and road fills shall be compacted to a minimum 90% relative compaction to minimize erosion. If significant erosion occurs as a result of any part of this project, applicant shall take prompt remedial action.

3. Filled slope banks shall not exceed a gradient of 2:1. Toes of all fills shall be stabilized with rock and gravel or keyed into stable soil and placed to reduce erosion potential to an absolute minimum on all fill slope banks. Revegetation of slopes shall be carried out as specified in Condition A. Unless approved by an engineering Geologist and Planning Department, cut slopes shall not exceed a gradient of 1½:1.

4. Subdrains shall be provided under all fills where natural drainage courses and seepage are evident.

5. No drill pad construction or access road shall be allowed on potentially active landslides, unless properly mitigated, subject to approval by the Planning Department.

6. Buffer zones of undisturbed vegetation shall be maintained 500 feet on either side of streams. No geothermal related construction shall take place within this buffer zone without specific approval from the Lake County Planning Commission. Roads crossing riparian areas shall be minimum safe widths.

7. A retaining levee of not less than eighteen (18) inches in height and three (3) feet in base thickness shall be placed on the perimeter of all fill areas including access road fills, pad site and reserve pit sites, to prevent storm runoff accumulation from random discharge.

8. Drainage plan to be submitted will distribute storm water runoff and channel it to existing natural waterways only to the extent that it will not increase water head to the point of unnatural channel abrasion. Energy dissipators and collection devices to reduce the erosion force of unnatural runoff will be required where determined by County or State Agency Representatives.

9. All grading activity shall be completed and all drainage structures shall be in place and operational prior to October 10 of any year. Grading and excavation activity may not be permitted during the consecutive period from October 10 to April 10. (It is understood that this is a general time frame. Extension beyond October 10 may be allowed by the Lake County Planning Director upon establishment of a suitable soil moisture specification for any stated activity).

10. Applicant shall agree to contract with the County of Lake for engineering and inspection services, as required, to a completion date agreed upon by the applicant and the County, to insure compliance with the above stated conditions. Such services shall be billed to the applicant and repayment by the applicant shall be deposited in the Lake County Geothermal Trust Fund.

11. In areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion.

C. ENVIRONMENTAL AND SAFETY PROTECTIONS:

1. The sump shall be designed by a registered civil engineer with assistance from a registered engineering geologist. Design of the sump fill shall be to a specification to withstand both static loads and dynamic loads (imposed by credible seismic events) with safety factors of 1.5 and 1.2 respectively. The sump shall be constructed of material compacted to minimum 95% relative compaction unless the Lake County Planning Director determines, based upon conclusive soil testing data, that a lesser compaction is adequate. The sump shall be lined with at least two feet of clay having a permeability not to exceed 1×10^{-6} cm./sec., or an equivalent impermeable membrane. Volume of the sump shall be sufficient to accommodate both the drilling mud and any reasonable amount of precipitation which could enter the sump.

2. The sump shall be operated in such a manner as to preclude overtopping of the sump. Three feet of free board shall be maintained at all times.

3. Applicant shall prepare a viable contingency plan for spills and emergency pumping of the sump in the event of a heavy, unexpected rainfall or if excessive geothermal fluids are encountered. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of construction.

4. Applicant shall prepare a viable contingency plan for emergencies due to breaks or unexpected deformation of the pipeline or its supports. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of testing or operations, and annually updated on anniversary of permits.

5. Prior to the removal of drilling equipment, sump fluids (both mud and supernatant liquids) shall be chemically analyzed, upon request from the Planning Department, for type and quatity of biologically sensitive materials, especially hazardous materials, heavy metals and acids. The chemical analysis shall be sent to the California Regional Water Quality Control Board and Lake County Planning Department for review. If said analysis does not indicate quantities in excess of allowable limits for either human or other important biological elements, especially those of the aquatic ecosystem, then sump materials shall be solidified, dried, mixed with native soil and buried. If hazardous or biologically sensitive materials are found, such materials shall be removed to a Class 2-1 or Class 1 disposal dump site as directed by the County or appropriate State Agency.

6. No hydrocarbon base cleaning agent, no waste oils or greases, and no liquid fuel shall intentionally be released directly onto the surface of a drill pad. All such liquids shall be contained and removed from the site. Any accidental discharge of the materials mentioned above shall be removed and properly disposed of by the applicant.

7. All unattended drilling equipment, well heads, sumps and ponds shall be protected from access by unauthorized persons by minimum 6 ft., locked, chain-link fencing.

8. Pipeline components which are exposed to ambient conditions at a temperature of 140 degrees fahrenheit or higher, where accessible to human reach, shall be designed to mitigate against inadvertent human burn injury.

9. Sanitary and hand washing vacilities shall be provided at the drill site and as specified by the Lake County Health Department.

10. In the event of casing blowout or other uncontrolled venting, the applicant shall move immediately to control the vent. No more than two (2) days shall elapse from the date of the uncontrolled vent to the date of equipment relocation to secure it.

11. Well discharge shall be directed away from adjacent woody vegetation and populated areas and appropriate energy dissipators shall be used as required by the Planning Department.

12. All solid waste material shall be removed from the site. Upon completion of drilling operations, unless otherwise approved by Planning Department, all equipment and materials unnecessary to the operation of the completed well shall be removed within sixty (60) days of completion of the well.

13. Applicant shall comply with the requirements of the fire prevention practices and measures as may be prescribed by the California Division of Forestry and/or County of Lake.

14. Provision shall be made for adequate sccess by fire-fighting equipment to the site, and fire access maps shall be provided to the appropriate Fire District (s).

15. Lights in the drilling rig shall be shielded so as to minimize visual impact at night to the portion of Bottlerock Road from which the drilling mast is visible.

16. Applicant shall provide the Planning Department with a plan which details the equipment and procedures which will be employed during powerplant outages (stacking periods) and during maintenance venting. This plan shall include proposed hours during which planned maintenance venting will occur as well as projected time which will elapse between unscheduled power plant outages and the throttling back of wells to minimum bleed. The plan shall include personnel available for unscheduled outages and projected response time of those personnel.

17. Applicant shall submit for the Planning Commission's approval a traffic control and road maintenance plan for High Valley Road. This plan shall take into account the great increase in heavy truck traffic which will accompany full field development of the Bottlerock site. The plan shall suggest mitigations which will prevent or alleviate the concomitant increase in danger due to traffic accidents and damage to the road which may occur following development.

18. Pipeline routes and design must be approved by the Planning Department prior to construction.

19. Prior to any construction activities, the applicant shall provide to the Planning Department for its approval a complete plan of development, showing locations of wells, pads, sanitary facilities, temporary and permanent storage and construction areas and buildings and the means by which these areas will be protected from unauthorized entry.

D. TO PROTECT AGAINST SURFACE WATER DEGRADATION:

1. In order to preserve the hydrologic integrity of this leasehold area applicant shall obtain by right or purchase all water used in drilling process or dust control.

2. The equipment service and fuel transfer areas and the area occupied by the drilling rig shall drain into the sump.

3. All fluids produced during testing after the sump has been filled shall be containerized and removed to a Class 1 or Class 2-1 disposal site, if required by the Planning Department or State Agencies.

4. The applicant shall continue to monitor the surface water quality of Kelsey and High Valley Creeks as required by the McCulloch Francisco Use Permit, and shall coordinate this water quality monitoring program with the ongoing California Department of Water Resources Water Quality Monitoring Program, said coordination being subject to approval by the Planning Department. Yearly microfaunal studies shall be initiated at times and locations specified in the McCulloch Department of Water Resources Bottlerock Steam Field EIR. Sampling procedures and parameters shall conform to those procedures and parameters outlined in the section entitled "monitoring", on pages 123 and 124 of that EIR.

5. If the applicant elects to conduct or participate in a larger and more comprehensive water quality program, it can be substituted for the requirements of D4. Such a proposal must be submitted to and accepted by the Planning Department and begun prior to the commencement of construction activities.

E. TO PROTECT AIR QUALITY:

1. Applicant shall meet all regulations and standards set

by the Lake County Air Pollution Control District and utilize on a continuous basis the state of the art of H_2S technology. This Use Permit does not supersede the authority of said District in any way.

2. After completion of geothermal wells, the H_2S emissions during standby venting of steam shall be either abated to acceptable level per Air Pollution Control District rules and regulations or standby venting shall be curtained to that level necessary to attain emission limitations. Curtailment methods to be utilized shall include the shutting in of geothermal wells as publicly agreed to by the applicant.

3. Applicant shall minimize vehicular dust on unpaved roads by the use of water or other acceptable dust retardant.

4. Applicant shall provide accurate chemical analysis of the geothermal resource if it is encountered, when required by the Air Pollution Control District.

5. The analysis shall include accurate "wet chemistry" and gas chromatograph determinations. Heavy metals such as lead, chromium, arsenic, antimony, mercury and cadmium should be determined as well as substances such as radon, hydrogen sulfide, boron, manganese, methane, fluoride, ammonia and carbon dioxide. The analysis should also include pH. The chemical analysis will be used in future use permit consideration for geothermal development on the project leasehold. The analysis shall be sent to the Planning Department within 45 days of completion of the well.

6. Applicant shall enter into agreements with Department of Water Resources or other parties as necessary and provide a written commitment and preliminary design of abatement systems as described in a letter dated February 15, 1980 from Ronald Robie, Director Department of Water Resources, to Lake County Air Pollution Control District which is acceptable to the Lake County Air Pollution Control District prior to all construction.

F. TO PROTECT AGAINST NOISE EXPOSURE:

1. Applicant shall meet a noise standard of Ldn 55 db (A) with a 10 db penalty between the hours of 10 P.M. and 7 A.M. of the following day at residences.

2. If measurements by the Planning Department indicate a possible violation of F.1, a measurement of the source noise in an appropriate location in the immediate vicinity of the source shall be made to determine if the source noise is sufficient to cause the level measured at F.1 to exceed 55 Ldn using the inverse square law. This source measurement shall be an equivalent sound level (Leq) averaged over a 24 hour period.

3. These regulations shall be adopted until a noise control ordinance is approved by the Board of Supervisors. Applicant agrees that the Planning Commission shall have the right to substitute the conditions of a General Noise Control Ordinance for the conditions of this section when adopted by the Board of Supervisors. It is understood by the Planning Commission and applicant that mufflers of advance design will be required for almost all geothermal operations in order to meet these standards and that extraordinary mitigative techniques such as lead/vinyl barriers and the wrapping of the drill rigs may be necessary to meet the noise standards of Section F-1 and F-2.

4. It is stipulated that the Lake County Planning Department will be spot monitoring noise levels in the vicinity of the proposed land use and that findings resulting from said monitoring may require the applicant, his contractors or agents to provide continuous noise level monitorings and readings as may be directed by the Planning Department.

5. It is also stipulated that the Planning Department has jurisdiction over noise investigation procedures and enforcement.

6. If the Planning Department receives noise complaints, the hours of heavy truck traffic to and from the site may be restricted to the hours between daylight and sunset only; except in cases of emergency.

7. Drill pipes shall not be laid in bins between the hours of 8 P.M. and 7 A.M. the following day.

G. TO PROTECT ARCHAEOLOGICAL RESOURCES:

1. Archaeological sites identified on pages 125-127 of the McCulloch Department of Water Resources Bottlerock Steamfield EIR shall be preserved in their existing state. No excavation or disturbance by the applicant or his contractors shall be permitted at these archaeological sites unless mitigated, subject to approval by the Planning Department and Sonoma State University's Resources Facility.

H. TO CONTROL VISUAL IMPACTS:

1. The revegetation program shall be formulated to include consideration of the visual impacts created by geothermal development.

2. Pipelines shall be colored in such a manner as to provide maximum color compatability with the vegetation type tyrough which it is routed. The choice of the color of the pipeline shall be made by the revegetation program contractor. Changes in color shall be made along the pipeline if necessary to blend with the background.

3. On visual edges such as ridgelines, low profile design approaches shall be employed.

4. All pad/road/pipeline sites shall be placed in areas, other environmental and engineering conditions being met, in such a manner that existing vegetation and topography will provide maximum screening.

I. UPON WELL ABANDONMENT:

1. The applicant shall abandon any well in accord with the Division of Oil and Gas Regulations.

2. Applicant shall refill sump and grade pad to reasonably restore a natural ground contour.

3. Applicant shall remove all pipelines and supports not necessary for field operation.

4. Applicant shall revegetate the pad and sump areas with woody vegetation that can be tolerantly sustained in accord with recommendations of the revegetation consultant or the procedure given in Condition A-1.

J. RE-ENTRY OF PRODUCTION OR SUSPENDED WELL BORES:

1. Applicant may re-drill or otherwise re-enter the same well bore of any well authorized under this Use Permit during the life of this project as long as all conditions of the Use Permit are met.

K. SEVERABILITY:

If any section, subsection, sentence, clause or phrase of this permit is for any reason held by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the remaining portions of the use permit. The Board of Supervisors hereby declares that it would have passed this use permit and each section, subsection, sentence, clause and phrase hereof irrespective of the fact that any one or more sections, subsections, clauses or phrases are declared invalid.

II. IN GRANTING THIS USE PERMIT, THE LAKE COUNTY BOARD OF SUPERVISORS MAKES THE FOLLOWING FINDINGS:

A. That this Use Permit does not abridge or supersede the regulatory powers or permit requirements of any State or Federal Agency or any Special District or other Lake County Department or Division which may retain an advisory or regulatory function as specified by statute or ordinance, nor does this Use Permit grant any title or other real property solely to this applicant or his assigns.

B. That the granting of this Use Permit is in the general public interest and that environmental and performance parameters conditioning the proposed activity as specified in this Use Permit and as contained in that document entitled "Conditions, Procedures and Performance for Geothermal Regulations, County of Lake" now referenced and made a part hereof, will allow the proposed activity with adequate safeguards to the welfare of the people of Lake County at large and to the people residing in the vicinity of said activity.

C. That this Use Permit shall be subject to revocation or modification by the Board of Supervisors of Lake County if:

1. The Board finds that there has been non-compliance with any of the foregoing conditions or:

2. The Board finds that the use for which this Use Permit is granted is so exercised as to be substantially detrimental to the general public or to property in the vicinity of the use.

Any such revocation shall be taken pursuant to Section 21-84 of the Ordinance Code of the County of Lake.

D. Noise levels from drilling operations will be muffled and times of other operations limited so as not to constitute a public nuisance.

III. THE BOARD OF SUPERVISORS FURTHER DECLARES THAT:

A. This Use Permit may be modified or revoked if the Lake County Board of Supervisors finds that the use to which this permit is put is detrimental to the health, safety, morals, comfort and general welfare of the persons residing or working in the neighborhood of such use, or

If it is injurious or detrimental to property and improvements in the neighborhood or the general welfare of the County, or is a nuisance.

Date of Issuance:

GEORGE R. VOLKER
Planning Director

By: _____
Irene L. Brown, Secretary

ACCEPTANCE

I have read and understand the foregoing Use Permit and agree to each and every term and condition thereof.

Date: _____

_____
Owner or Authorized Agent

DP;lds

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

September 2, 1980

Pranab Chakrawarti
Planning Director
Sonoma County Community and
Environmental Services
2555 Mendocino Avenue
Santa Rosa, CA 95401

Dear Pranab:

Based upon your suggestion at the meeting you attended in June here in our office, the staff of the GRIPS Commission has analyzed Sonoma County's use permitting procedures for geothermal electric power development projects.

The Work Program for our Direct Heat Project (approved by D.O.E. as of August 1) also involves a review of the counties' policies and permitting processes. However, that review is related to development of geothermal direct heat applications; and we anticipate it will identify issues not touched in the enclosed review of your geothermal electric power development permit procedures.

When we meet with you, we will want to discuss how we can best integrate the information developed in the two studies. In the interim, you may want to consider identifying your present geothermal procedures as having application to power generation geothermal projects, and provide that direct heat proposals will be reviewed on a case-by-case basis pending development of a set of policies and guidelines specifically developed for direct heat permits.

In order to structure the evaluation, a list of criteria was drawn up that encompasses the most important elements of the permitting process. These criteria are as follows:

1. Time required for permit processing.
2. Ease with which the status of applications can be determined.
3. Site investigations conducted by staff and decision makers.
4. Relationship of permit processing to existing plans, policies and standards.
5. Completeness of conditions.

Pranab Chakrawarti
September 2, 1980

6. Clarity of conditions.
7. Structure of conditions for Board of Zoning Adjustment review.
8. Structure of conditions for application by the developer.
9. Usefulness of environmental impact information.
10. Usefulness of staff report.

The body of the report presents the overall conclusions reached as a result of an evaluation of each criterion. In addition, an Appendix has been prepared which provides a detailed evaluation of individual use permit conditions.

I hope you will find the information contained in the attached report useful. It has not been our intention to make this a definitive work. Rather, it is viewed as a survey of the existing situation which will serve as a basis for allowing us to work with the County's staff to improve the geothermal permitting process.

This report has been developed as a part of a contract between the GRIPS Commission and the D.O.E. which has involved a review of county geothermal policies and procedures. We must submit a final report to D.O.E. in draft form by December 1, 1980, under the conditions of this contract. We are hopeful of getting together with you during late October in order to receive your input on the report and to develop a projection of what action may occur as a result of the preparation and submission of the report. Of particular interest would be a determination as to whether you feel that there is any way we can assist you in making your County's permitting process more effective.

If you wish to receive copies of the use permits or conditions used by any of the other counties, please give Bob Van Horn or Paula Blaydes a call.

Sincerely,

Douglas K. Caldow/seb

DOUGLAS K. CALDOW, AICP
Project Coordinator

DKC/seb:dr
Enclosure

G.R.I.P.S. COMMISSION

2628 MENDOCINO AVENUE, SANTA ROSA, CALIFORNIA 95401 (707) 527-2025

ANALYSIS OF

SONOMA COUNTY'S

GEOTHERMAL PERMITTING PROCEDURES

Prepared by

G.R.I.P.S. Commission

August 21, 1980

Geothermal Research, Information and Planning Services / A California Joint Powers Agency

Lake County
Mendocino County
Napa County
Sonoma County

INTRODUCTION

This report presents the overall conclusions reached as a result of a detailed evaluation of Sonoma County's geothermal permitting procedures. The evaluation consists of an analysis of ten criteria, and the overall conclusions that follow are presented under the headings of the individual criteria. At the end of the report, in the Appendix, there is a detailed condition-by-condition analysis of a typical Sonoma County geothermal use permit focusing primarily on the completeness of the conditions and on clarity of expression.

1. Time Required for Permit Processing

The County would appear to have a very good record for processing field development use permits quickly. Four of the most recent field development use permits issued (Thermogenics' Abril 6, Shell Oil, Magma Power's 5 MW power plant, and Aminoil's 7 West) were all processed in from 2-4½ months, although it should be noted previous EIRs were recertified for each of these projects. Presumably, the period for permit processing would have been more extensive had it been necessary to prepare a full EIR.

The County has sought to establish a good working relationship with the State Division of Oil and Gas in processing the one exploratory use permit that has been reviewed since AB 2644 became effective. Under AB 2644 DOG has a 135-day maximum period to review geothermal exploratory permits. The essential element in working jointly on permit processing is good communication between the two agencies. Apparently, DOG is doing a good job in this regard.

The only concern that has been raised relative to the speed at which permits are processed relates to occasional difficulties in finding time available on the agendas for Board of Zoning Adjustment (BZA) meetings. Occasionally, permits are delayed for from one to several weeks due to crowded agendas. Otherwise, the staff feels confident that once an application is filed with complete plans and environmental data, the permit can be processed quite expeditiously.

2. Ease with Which the Status of Applications Can Be Determined

The Planning Department staff has created a system of color-coded cards, that when filled in and displayed properly, enable any member of the staff to check on the status of individual development applications. The key to being able to check quickly on the status of a geothermal use permit application is to know either the project name, applicant's name or file number. This system, which is relatively new, appears to work effectively for applications which are currently being processed. However, the files on old geothermal development applications are often incomplete, and it is frequently difficult to determine what actions were taken in the past.

In addition to the color-coded cards, Mike Cale, the staff member responsible for processing geothermal use permits, maintains his own geothermal use permit status board on a wall by his desk. This board provides such information as when the application was filed, whether a grading permit has been issued, whether a field check has been conducted and a staff report has been prepared, etc. To utilize this status board, you must know either the applicant's name or the project's name; there is no locational information to help identify a project.

3. Site Investigations Conducted by Staff and Decision Makers

Site field investigations are conducted by the staff for most geothermal projects prior to the preparation of the staff report. However, there is no current procedure whereby members of the BZA take field trips to The Geysers to develop a first hand understanding of a project before making a decision on a permit application.

4. Relationship to Existing Plans, Policies and Standards

The Sonoma County General Plan establishes the beginning of a framework within which day-to-day decisions regarding geothermal development should be made. However, the Plan's goals, policies and recommendations do not, by themselves, provide sufficient guidance for decision makers such as the BZA or staff to rely on in their daily work. Their most useful contribution in this regard is to entreat the decision makers to "Apply high standards governing all phases of geothermal exploration and production, including restoration of all such areas to acceptable conditions once the resource becomes nonproductive".

The General Plan does, however, appear to point the way for a course of action that could lead to more finely-tuned development decisions. Following the Plan's overall goal for development of the resource, there is a policy statement, "Consider action by the Board of Supervisors to initiate a comprehensive geothermal-resource management program." There is, in turn, a specific recommendation that, "A comprehensive geothermal-resource management program should be formulated and utilized." While the character and content of this "comprehensive geothermal-resource management program" is not spelled out in the Plan, the issue is being joined on several levels. These

involve utilization of the direction given in the County General Plan, development of Specific Plans such as the Franz Valley Specific Plan, initiation of a Geothermal Development District within the County's Zoning Ordinance, and preparation of a Master Environmental Assessment (MEA) covering the KGRA or at least The Geysers dry steam field area. Out of such a package, it is anticipated that the staff, BZA and ultimately, when necessary, the Board of Supervisors will be in a position to make timely, well-informed and consistent decisions regarding geothermal development permit applications.

A similar management program, without the Specific Plan component, has already been put together by Imperial County. In that case, they started with a Geothermal Element to their existing County General Plan, and went from there to a zoning district and MEA covering at least one of the KGRAs in the County. The package seems to be working well for them according to reports from the County Planning Director and the Geothermal Coordinator. Moreover, the management program has enabled them to fulfill their desire to obtain lead agency status from DOG over exploratory projects. (Copies of Imperial County's Geothermal Element and zoning district are on file in the G.R.I.P.S. Commission's library, and can be made available for review if desired.)

5. Completeness of Conditions

This section of the report addresses whether Sonoma County's geothermal use permit conditions deal with all the topics of relevance as well as all of the aspects of each topic that are important. In addition, the questions of redundant conditions and unnecessary conditions are also addressed, and some overall conclusions are drawn. While the overall conclusions are presented in the body of this report, a very detailed item-

by-item analysis of each condition, and a comparison of Sonoma County's conditions with conditions imposed by other KGRA counties, is contained in the attached Appendix.

Since the basis for the preparation of the conditions attached to each use permit is the listing of conditions contained in prior use permits, there is no guarantee that all of the conditions that are appropriate will be included. For example, a review of recent conditions applied on use permits when compared against conditions imposed by other KGRA counties would raise the question as to whether it might also be useful to address the subjects of blowouts, road maintenance, flora and fauna, safety, visual impact and liability insurance.

A similar type of problem concerns situations in which a subject is already addressed by one or more conditions, but where a particular aspect of the topic is not dealt with. For example, the County normally includes a number of conditions regarding water quality protection; however, there is no requirement such as Lake County has that a contingency plan be prepared for emergencies due to pipeline breaks. This type of omission may have been deliberate, or it may represent an approach that was not considered at the time the use permit was approved. In any event, the conditions found in use permits issued by other KGRA counties may suggest some approaches that Sonoma County may wish to incorporate in its use permits.

Opposite to the problems of omission is the problem of redundancy. Our review reveals that there is some redundancy between conditions contained on the same use permit, although it is understood the staff has made progress recently in clearing up some of these situations. The redundancy that does exist is capable of creating confusion on the part of the developer at the time

construction is actually occurring. Examples of this situation can be found in conditions dealing with noise and sanitary facilities. The possibility of confusion is further enhanced by the fact that the two conditions in which a topic is discussed are not proximate to one another.

Although it is unquestionably more important to ensure that the conditions imposed are complete, the presence of unnecessary conditions can also have a deleterious effect in terms of the time spent preparing and reviewing the conditions, as well as in terms of the effect the document has in conveying an impression of being expertly conceived and authoritative. In Sonoma County's use permits there are a few conditions, or parts of conditions, which might be unnecessary that deal with the subjects of fire protection and radioactivity surveillance. For example, radioactivity surveillance really only applies to use permits issued for power plants.

Perhaps the best way of avoiding these problems of completeness would be to create an ordinance or resolution establishing the basic conditions that will be required of all geothermal developers and utilizing the most appropriate terminology for expressing those conditions.

The analysis of the conditions normally imposed by the County reveals that few are site-specific in nature. In other words, they could be applied to virtually any geothermal development at The Geysers. Therefore, it might be useful to embody a set of basic conditions in the form of an ordinance, or, for ease of amendment, a resolution, that would be automatically applicable to each new development proposal. Clearly, additional site-specific conditions could be drawn up as well. Lake County has made an effort to create such a standardized set of

conditions, and a copy of this has already been made available to your staff.

6. Clarity of Conditions

This section of the report evaluates the clarity with which use permit conditions are expressed. The general conclusion, along with examples, are presented here in the body of the report, while the detailed analysis of individual conditions is a part of the same Appendix in which the item-by-item evaluation of completeness is contained.

For the most part, the conditions contained in the use permits are expressed fairly clearly; however, there are instances in which the wording is either vague, ambiguous or abstruse. An example of abstruse phrasing can be seen in the following condition, which is normally the first condition listed in a use permit.

> "In the development of the geothermal resources, the entirety of the project from the first exploratory well to the power plant and transmission lines evolves piecemeal, and there is at the beginning no description of the final form of the project. As a consequence of the uncertainties involved, it should be clearly understood that approval of this or any other single permit in no way implies approval of any other future permits dealing with other aspects or other parts of the total endeavor of geothermal energy development on this lease."

Conceivably, this statement would be more clearly grasped on the first reading if it were rephrased to state,

> "Approval of this permit in no way implies approval of any other future permits on this lease."

An example of an ambiguous condition is one dealing with noise in which the term "phases" apparently has two different meanings. Vagueness is more common in the wording of the conditions than either abstruseness or ambiguity. At times this is undoubtedly intentional, especially when room for interpretation according to the circumstances of a particular case is desirable. At other times this may not be intentional. For example, a condition regarding waste disposal sites states that one "... shall be provided as required by the County ...", but does not specify in a manner that would be helpful which agency in the County may require this, or whether "the County" refers to the BZA or Board of Supervisors.

Again, as discussed under "Completeness of Conditions", the best way of ensuring that the conditions are worded clearly may be through the creation of a standardized set of conditions adopted by ordinance or resolution.

7. Structure of Conditions for Board of Zoning Adjustment Review

There does not appear to be a clear and logical sequence to the conditions expressed in the typical use permit. In one use permit the condition which deals with the effective date of the permit is found in the middle while it should logically come towards the end. In recent weeks the staff has improved some

of these situations. However, more importantly, there is nothing about the sequence of the conditions, and no topic headings that would allow members of the Board of Zoning Adjustment to judge whether, in fact, all important consequences of the project have been considered in the conditions expressed.

The situation might be improved if a standard set of conditions was adopted containing headings for each of the environmental concerns and the administrative factors that are typically incorporated in use permit conditions. In this way, there would be less likelihood of inadvertent omission of an important condition, and, similarly, there would be less likelihood of redundancy of conditions. Logically, conditions dealing with the same topic would be grouped together instead of scattered throughout the permit, as is the case in Use Permit 9533 in which noise is discussed in Condition No. 5C as well as again in Condition No. 24, and fire protection is discussed in Condition No. 13 as well as in Conditions No. 30 and 31.

8. Structure of Conditions for Application by the Developer

Just as the conditions are not structured to assist the BZA in their review of the permit, neither are the conditions structured to facilitate implementation by the developer. While the Board of Zoning Adjustment's responsibility is to insure that each individual aspect of environmental impact is dealt with in their review of the proposed permit, the developer, once the permit is approved, views the conditions from a different perspective. For him, the conditions are most useful if they are structured in a manner that reflects the different construction phases. Perhaps this situation could be

improved if, following approval by the BZA, the conditions were reordered and new headings utilized, such as "Conditions Affecting Earth Movement" or "Conditions Relating to Abandonment of the Site".

It might also be helpful to the developer if the use permit, instead of referring to mitigation measures contained in the Environmental Impact Report, rewrote those conditions within the appropriate format.

9. Usefulness of Environmental Impact Information

The considerable bulk of most EIRs undoubtedly mitigates against a close reading by the members of the BZA; particularly when coupled with crowded agendas and when most of the EIRs are generalized leasehold evaluations prepared several years previously. The impression is thereby given that the BZA relies very greatly on the staff for its input regarding potential environmental impact.

The staff in turn derives its environmental information from a number of sources. Besides the EIR, the two most obvious sources are from the development plans submitted along with the permit application, and from on-site inspection.

In those situations in which an older more generalized EIR is being recertified, the staff usually requests the applicant to provide supplementary site-specific environmental information. Typically the applicant retains an EIR consultant to obtain the required information. On the basis of the data provided by these sources, the staff report is written and appropriate conditions are selected for the use permit. One indication of the value of the EIRs is that the use permits frequently utilize by refer-

ence the mitigation measures identified in the applicable EIR.

10. Usefulness of Staff Report

Overall, the BZA Staff Reports present the essential project information in a well-structured and concise manner. However, under the heading "Location", the site description using section numbers and assessor's parcel numbers is probably not too helpful to the BZA members; a map might be more useful supplemented with more descriptive locational information such as drainage basin, nearest road, etc. In addition, perhaps a little more information could be provided under the heading "Environmental Status". Especially when a previous EIR is being recertified, this might be stated and the EIR title and date given.

APPENDIX A

This Appendix provides a detailed item-by-item evaluation of geothermal use permit conditions found in a typical Sonoma County use permit (UP 9533), a copy of which is provided at the end of this Appendix. On the basis of conditions already imposed by one or more KGRA counties, 26 individual topics were selected for evaluation to determine whether Sonoma County currently covers these topics (and covers all aspects of each topic), and whether the phraseology used in expressing each condition is clear.

The primary method of analysis has been to compare the completeness and clarity of Sonoma County's conditions with conditions used by the other three KGRA counties. Thus, conditions imposed by the other counties are often cited. The intent is not to suggest that the other counties necessarily handle a given topic better, and therefore, imply that Sonoma County should change its conditions. Rather, the intent is simply to point out an option that the County may or may not have previously considered, so that the County can itself make a reasonable choice based on more complete information.

As used herein "The County" shall refer to Sonoma County. And, the condition numbers cited in parentheses refer to the number of that condition in UP 9533.

1. Introductory Stipulations

The County's condition (#2), which limits the number of drilling pads and wells that the permit covers, appears to be appropriate and clearly expressed.

Napa County has a condition on temperature probe permit applications limiting the depth of the holes which states, "The maximum depth of each temperature gradient hole be 152 meters (500 feet)".

The County's existing condition (#1), disclaiming implied approval of any future permits, is a useful one; however, the way in which it is expressed is not clear and should be rephrased along the lines discussed under Section 6, Clarity of Conditions, in the body of this report.

Lake County has a stipulation that states, in part, "That the granting of this use permit is in the general public interest and that environmental and performance parameters conditioning the proposed activity as specified in this use permit...will allow the proposed activity with adequate safeguards to the welfare of the people of Lake County at large and to the people residing in the vicinity of said activity."

Napa County has a use permit condition which states, "Changes shall not be made in the work described in this permit, whether in relation to location, dimensions, materials, or character of the work, without written authorization of the Commission, except in case of an emergency."

2. Term Use Permit Valid

Napa County has a condition that states in part, "The operator shall begin the work within sixty (60) days from the date of permit approval and shall notify the Conservation, Development and Planning Department at least twenty-four (24) hours prior to commencement of work." Otherwise, the standard Sonoma County condition (#19) is perfectly adequate.

3. Severability

The standard Sonoma County severability clause (#33) is fine; however, consideration should be given as to whether the reference in the last sentence to the Board of Supervisors should instead refer to the Board of Zoning Adjustment.

4. Modification and/or Revocation

The standard Sonoma County condition (#34) seems to be fine.

5. Compliance with Other Laws and Regulations

The standard Sonoma County condition (#6) in this regard appears to be fine.

6. Archaeology

The standard Sonoma County condition (#20) reads, "Mitigations recommended in the EIR to protect the archaeological resources shall be followed. If archaeological resources not identified

in the EIR are encountered, construction will be halted, and appropriate mitigation employed, subject to Planning Director approval." The first sentence of this condition is probably fine, although consideration could be given to citing the appropriate page of the EIR. The County may wish to consider replacing the second sentence of the condition with the phrasing that is used by both Napa and Mendocino counties, which reads as follows: "When American antiquities or other objects of historic or scientific interest including, but not limited to, historic or prehistoric ruins, fossils, or artifacts are discovered in the performance of the permit, the item(s) or condition(s) will be left intact and immediately brought to the attention of the Director."

7. Fire Protection

The standard County conditions (#13, 30 and 31) may be adequate; however, the District Ranger for the Department of Forestry is reviewing these conditions and may make some recommendations. Any such recommendations will be promptly forwarded to the County. Consideration should be given to consolidating the existing conditions into one condition or at least bringing them together sequentially.

8. Blowouts

Sonoma County does not have a condition regarding well blowouts. Lake County's is as follows: "In the event of casing blowout or other uncontrolled venting, the applicant shall move immediately to control the vent. No more than two days shall elapse from the date of the uncontrolled vent to the date of equipment relocation to secure it."

9. Site Security

The standard Sonoma condition (#16) may be fine. This condition reads, "All unattended drilling equipment, wellheads, sumps, ponds and other hazardous equipment or facilities, shall be protected from access by unauthorized persons." On the other hand, the County may wish to be more specific in its requirements. Lake County's requirement reads as follows, "All unattended drilling equipment, wellheads, sumps and ponds shall be protected from access by unauthorized persons by minimum six feet, locked, chain-link fencing."

10. Access to Site and Limits on Area of Construction Activity

The County's standard condition (#8) covering this topic is fairly general in its form, which is appropriate in certain cases; however, in more difficult situations, some consideration might be given to being more specific like Napa County's condition, used on a temperature probe permit. Napa County's conditions are as follows:

"1. No vehicular operations outside of the boundaries of the improved roads and staked areas of operation.

2. An area of 15 x 15 meters (50 x 50 feet) to be demarcated by stakes at both drill sites. All equipment movement, storage, and drilling activities to be limited to that area.

3. Access to the sites within Bear Valley to be via Van Ness Creek Road which may be improved as follows:

   a. No more than 30 meters (100 feet) of brush clearance laterally along the shoulder of the road where it is contiguous to the Creek.

b. No mature forest trees to be removed or damaged.

c. Road extension from end of existing Van Ness Creek Road to drill site to consist of corridor across the meadow whose boundaries shall be 3 meters (10 feet) apart and marked by stakes and whose length shall be approximately 500 meters (1600 feet).

d. Temporary culverts on Van Ness Creek or its tributaries to minimize earth movement within channel. Culverts to be removed at end of probe observation study. Drainage channel to be returned to original condition and culverts to be removed from site.

e. Minor grading of existing road to facilitate truck movement through areas of currently eroded road bed or removal of material resulting from soil slumpage. All spoils to be distributed along the length of the existing road and compacted by use of the road.

f. No vehicular operations outside of the boundaries of the improved Van Ness Creek Road, meadow corridor, and staked area of operation."

11. Radioactivity

Sonoma County's condition (27) in this regard really only applies to use permits issued on power plants and not on exploratory or development wells.

12. Air Quality

Sonoma County's conditions (#28 and 29) regarding air quality are quite general, although they may be perfectly adequate for temperature probes and exploratory projects. However, in the case of field development projects, some consideration might be given to a set of more specific air quality conditions along the lines of Lake County's use permits. The Lake County conditions are as follows:

"E. TO PROTECT AIR QUALITY:

1. Applicant shall meet all regulations and standards set by the Lake County Air Pollution Control District and utilize on a continuous basis the state of the art of H_2S technology. This Use Permit does not supersede the authority of said District in any way.

2. After completion of geothermal wells, the H_2S emissions during standby venting of steam shall be either abated to acceptable level per Air Pollution Control District rules and regulations or standby venting shall be curtailed to that level necessary to attain emission limitations. Curtailment methods to be utilized shall include the shutting in of geothermal wells as publicly agreed to by the applicant.

3. Applicant shall minimize vehicular dust on unpaved roads by the use of water or other acceptable dust retardant.

4. Applicant shall provide accurate chemical analysis of the geothermal resource if it is encountered, when required by the Air Pollution Control District.

5. The analysis shall include accurate "wet chemistry" and gas chromatograph determinations. Heavy metals such as lead, chromium, arsenic, antimony, mercury and cadmium should be determined as well as substances such as radon, hydrogen sulfide, boron, manganese, methane, fluoride, ammonia and carbon

dioxide. The analysis should also include pH. The chemical analysis will be used in future use permit consideration for geothermal development on the project leasehold. The analysis shall be sent to the Planning Department within 45 days of completion of the well.

6. Applicant shall enter into agreements with Department of Water Resources or other parties as necessary and provide a written commitment and preliminary design of abatement systems as described in a letter dated February 15, 1980, from Ronald Robie, Director Department of Water Resources, to Lake County Air Pollution Control District which is acceptable to the Lake County Air Pollution Control District prior to all construction.

16. Applicant shall provide the Planning Department with a plan which details the equipment and procedures which will be employed during power-plant outages (stacking periods) and during maintenance venting. This plan shall include proposed hours during which planned maintenance venting will occur as well as projected time which will elapse between unscheduled power plant outages and the throttling back of wells to minimum bleed. The plan shall include personnel available for unscheduled outages and projected response time of those personnel."

13. Water Quality

With reference to the condition (#11) regarding disposal sites, the vagueness of the term "The County" has already been discussed in the body of this report.

Another condition (#21) required by the County states, "No construction activity shall occur in the immediate vicinity of any spring ...". The reference to "immediate vicinity" is quite vague. As another way to handle this, consideration might be given to identifying the adverse impacts of development in the immediate vicinity of hot springs, fumaroles, etc., and then on

a case-by-case basis determining the appropriate mitigation measures.

Other water quality conditions (#26 and 32) by the County seem to be appropriate, although some consideration might be given to requiring contingency plans such as Lake County does in their conditions which read as follows:

> "Applicant shall prepare a viable contingency plan for spills and emergency pumping of the sump in the event of a heavy, unexpected rainfall or if excessive geothermal fluids are encountered. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of construction.
>
> Applicant shall prepare a viable contingency plan for emergencies due to breaks or unexpected deformation of the pipeline or its supports. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of testing or operations, and annually updated on anniversary of permits."

14. Erosion

The first sentence of one of the conditions which deals with grading permits and site plans is particularly abstruse. The condition (#4) reads as follows:

> "Prior to development of the drill pad, a Grading Permit shall be secured from the County Building Department and detailed Site Plans, including construction standards, shall be submitted to the Planning Director for approval and that prior to development of road access to any pad site, a detailed Road Plan, including construction standards, shall be approved by the Planning Director, and a Grading Permit obtained from the Building Inspection Department."

The next sentence of that same condition may be vaguer than is desirable. This sentence reads, "Construction work shall be conducted in dry weather and all of said plans shall be subject to approval by the Sonoma County Water Agency." It is the phrase "...conducted in dry weather...", that is quite vague. Similarly, the County's next condition (#9) may also be more vague than is necessary or desirable. The County's standard conditions reads as follows, "All cut and fill slopes of the drill pad and access road, and such adjacent slopes that have been disturbed in construction of said facilities, shall be stabilized and reseeded to prevent erosion, and such work shall be completed prior to the onset of fall rains or as otherwise recommended in the EIR." Of particularly concern, with regard to its vagueness, is the phrase "... and such work shall be completed prior to the onset of fall rains...". To avoid these problems of vagueness, without going to the other extreme of setting arbitrary dates, the County might give some consideration to identifying the adverse impacts of development in wet weather, and then on a case-by-case basis depending on local conditions of soil types, slope, vegetative cover, etc., determining the appropriate controls.

With regard to the question of erosion, Lake County has devised a rather complete set of conditions that are quite specific, and Sonoma County may wish to consider the adoption of one or more of these conditions. Lake County's conditions are as follows:

"B. TO PROTECT AGAINST EXCESSIVE SOIL EROSION, INDUCED LANDSLIDES AND SURFACE GEOLOGIC HAZARDS:

1. Plans for drill pads, steam transmission pipelines, sumps and access roads shall be prepared by a registered civil engineer with assistance from a registered engineering geologist. Topographic mapping by photogrammetric methods shall be used for design and be supplemented as necessary with ground surveys. Road, pipeline, and pad locations shall be staked on the ground and adjusted as necessary before completion of final plans. Plans shall include a separate drainage plan using five-foot contour intervals and supporting calculations for culvert sizes using acceptable engineering methods. Plans shall show specific provisions for erosion protection along pipeline routes, at culverts and on cut and fill slopes, detailed specifications for construction should be prepared in a manner similar to applicable portions of "Forest Service General Provisions and Standard Specifications for Construction of Roads and Bridges - 1977" and "Regional Standard Specifications", a U.S.D.A. Forest Service. Plans, specifications and ground locations shall be approved by the Planning Department or their authorized representatives before starting construction, and shall also be approved by the Regional Water Quality Control Board prior to construction.

2. Drill pad and road fills shall be compacted to a minimum 90% relative compaction to minimize erosion. If significant erosion occurs as a result of any part of this project, applicant shall take prompt remedial action.

3. Filled slope banks shall not exceed a gradient of 2:1. Toes of all fills shall be stabilized with rock and gravel or keyed into stable soil and placed to reduce erosion potential to an absolute minimum on all fill slope banks. Revegetation of slopes shall be carried out as specified in Condition A. Unless approved by an engineering Geologist and Planning Department, cut slopes shall not exceed a gradient of 1½:1.

4. Subdrains shall be provided under all fills where natural drainage courses and seepage are evident.

5. No drill pad construction or access road shall be allowed on potentially active landslides, unless properly mitigated, subject to approval by the Planning Department.

6. Buffer zones of undisturbed vegetation shall be maintained 500 feet on either side of streams. No geothermal related construction shall take place within this buffer zone without specific approval from the Lake County Planning Commission. Roads crossing crossing riparian areas shall be minimum safe widths.

7. A retaining levee of not less than eighteen (18) inches in height and three (3) feet in base thickness shall be placed on the perimeter of all fill areas including access road fills, pad site and reserve pit sites, to prevent storm runoff accumulation from random discharge.

8. Drainage plan to be submitted will distribute storm water runoff and channel it to existing natural waterways only to the extent that it will not increase water head to the point of unnatural channel abrasion. Energy dissipators and collection devices to reduce the erosion force of unnatural runoff will be required where determined by County or State Agency Representatives.

9. All grading activity shall be completed and all drainage structures shall be in place and operational prior to October 10 of any year. Grading and excavation activity may not be permitted during the consecutive period from October 10 to April 10. (It is understood that this is a general time frame. Extension beyond October 10 may may be allowed by the Lake County Planning Director upon establishment of a suitable soil mositure specification for any stated activity.)

10. Applicant shall agree to contract with the County of Lake for engineering and inspection services, as required to a completion date agreed upon by the applicant and the County, to insure compliance with the above stated conditions. Such services shall be billed to the applicant and repayment by the applicant shall be deposited in the Lake County Geothermal Trust Fund.

11. In areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion."

15. Noise

The standard Sonoma County conditions (#5 and #24) regarding noise are as follows:

"5. The operator must give evidence to the Planning Director prior to the commencement of each phrase of operation that he will use the most feasibly effective muffling equipment currently available in all phases of well drilling, cleanout, bleeding and testing so that the noise level specified under this condition may be insured.

The noise levels produced during the drilling or operation of any geothermal well shall comply with the standards set forth below:

a. The term "Development" phase as used herein shall apply to all activities occurring from the spudding of a well to the time when the geothermal energy so produced is sold or otherwise applied to a commercial use, and shall, also, include well maintenance requiring a drilling rig during the "Operational" phase.

b. The term "Operational" phase shall apply to all those activities other than development activities, except for rig maintenance of a production well as specified in (a) above.

c. The operator shall exercise continuous care and diligence in all operations so as to minimize sound emissions, and will select and use the most effective equipment, procedures, and methods currently available so as to assure compliance with this permit. Said measures shall include the selection of pad sites which are naturally screened, when such an alternate is feasible; the construction of artificial screens, baffles or other devices; and the proper orientation of sound production equipment.

24. Noise levels shall not exceed 65 dBA at the leasehold line; nor shall they exceed 65 dBA between 7:00 a.m. and 10:00 p.m. or 45 dBA between 10:00 p.m. and 7:00 a.m. as determined at any neighboring residential premises."

It is unclear why the terms "development" and "operational" are defined when there are no other references to these terms elsewhere in the conditions. In addition, Condiction 5c appears to be partially redundant of what is said in the first part of Condition 5. It would seem obvious that the noise levels established in Condition 24 should be expressed as part of Condition 5 -- perhaps Condition 5d.

Finally, some consideration might be given to the addition of a more specific conditions such as Lake County's which states as follows, "Drill pipes shall not be laid in bins between the hours of 8 PM and 7 AM the following day".

16. Road Maintenance

Sonoma County does not, at the present time, have a condition regarding road maintenance. Consideration might be given to adoption of a condition similar to one used by Lake County. The Lake County conditions states as follows:

> "Applicant shall submit for the Planning Commission's approval a traffic control and road maintenance plan for High Valley Road. This plan shall taken into account the great increase in heavy truck traffic which will accompany full field development of the Bottle Rock site. The plan shall suggest mitigations which will prevent or alleviate the concommitant increase in danger due to traffic accidents and damage to the road which may occur following development."

In addition, consideration might also be given to the impact of road maintenance on erosion and siltation.

17. Flora and Fauna

Sonoma County does not have a standard condition relating to flora or fauna protection. Consideration, insofar as plant protection is concerned, might be given to a general condition such as Lake County's which states, "Vegetation beyond the construction perimeters shall not be disturbed. The current limits for the pad shall be specified in the plans and specifications to be submitted for approval to the Planning Department."

Another condition imposed by Lake County might also be applicable. This condition states, "Well discharge shall be directed away from adjacent woody vegetation and populated areas and appropriate energy dissipaters shall be used as required by the Planning Department."

None of the four KGRA counties utilizes a standard condition regarding fauna protection.

18. Sanitary Facilities

The County has two standard conditions (#14 and #25) that are normally used, and these would seem to be redundant of one another. The two standard conditions are as follows, "Sanitary and hand-washing facilities and a drinking water source satisfactory to the Public Health officer shall be provided at the drill site." The second condition states, "Sanitary facilities shall be provided for workers at the drill site as required by the Sonoma County Health Department."

19. Visual Impact

Sonoma County has no standard clause on visual impacts. The County may wish to consider adopting a set of conditions in this regard such as those utilized by Lake County. The Lake County conditions are as follows:

"H. TO CONTROL VISUAL IMPACTS:

1. The revegetation program shall be formulated to include consideration of the visual impacts created by geothermal development.
2. Pipelines shall be colored in such a manner as to provide maximum color compatability with the vegetation type through which it is routed. The choice of the color of the pipeline shall be made by the revegetation program contractor. Changes in color shall be made along the pipeline if necessary to blend with the background.
3. On visual edges such as ridgelines, low profile design approaches shall be employed.
4. All pad/road/pipeline sites shall be placed in areas, other environmental and engineering conditions being met, in such a manner that existing vegegation and topography will provide maximum screening."

20. Bonding

The standard Sonoma County condition (#18) in this regard seems quite clear. The County may wish to consider adding a few more sentences similar to those used by Napa County, which state as follows:

"The operator shall abate any public nuisance and adverse affect on public health, safety or welfare caused by the project and return site as nearly as possible to its original state. The bond will

indemnify the County for any costs incurred by the County in repairing any drill or test facility site, as nearly as possible to its original state and in abating any public nuisance caused by an operator's exploratory or testing operation."

21. Insurance

Sonoma County has no standard insurance clause. The County may wish to consider adopting a clause similar to Napa County's, which states as follows:

"Before commencing the project, the permitee shall show continuing evidence of insurance against liability in tort in a minimum amount of one million dollars arising from the exploration and testing activities or operations incidental thereto conducted or carried on under or by virtue of any law or ordinance. Such insurance shall be kept in full force and effect during the period of such operations."

22. Liability

The County has no standard liability clause. Consideration might be given to the adoption of a liability clause or condition such as Napa County's, which states as follows:

"Neither the issuance of this use permit nor compliance with the conditions thereof shall relieve an operator from any responsibility otherwise imposed by law for damage to persons or property; nor shall the issuance of this use permit hereunder serve to impose any liability upon the County of Napa, its officers or employees, for injury or damage to persons or property. This use permit shall not relieve the operator of the responsibility of securing and complying with Napa County Ordinance No. 499 or any other permit which may be required by other County ordinances, regional directives, or state or federal laws."

23. Re-Entry

Sonoma County has no standard re-entry condition. The County may wish to consider a condition which states as follows: "Upon approval of the Planning Director, applicant may re-drill or otherwise re-enter the same well bore of any well authorized under this use permit during the life of this project as long as all conditions of the use permit are met, and so long as circumstances bearing on the project have not materially altered." This condition is based on one used by Lake County although it has been strengthened with regard to changes in circumstances surrounding the project.

24. Completion and/or Abandonment

The County's standard conditions (#12, 15, and 17) in this regard dealing with removal of equipment or materials, reseeding, and sumps are quite clear as far as they go. Although there may be some question as to whether the data is proprietary, the County may wish to consider some additional conditions such as the following:

- Mendocino County's condition which states, "These use permits are granted on the condition that the applicant reports to the County Planning Department by May 24, 1978, about the significance of the temperature gradient measured."

- Napa County's condition which states as follows, "The applicant shall give notice of completion of geothermal resources exploration operations submitted in duplicate and containing the following information for each hole drilled:

a. Final hole designation and location.

b. A driller's log noting water table and water aquifers encountered (if determined) and salt, coal beds or other mineral deposits, if present.

c. Method of completion, cementing and casting and/or tubing used.

d. Complete details of abandonment procedures.

e. Any information on drilling difficulties or unusual circumstances of operations for protection of the environment in the area concerned."

Another condition imposed by Lake County raises questions about the Planning Department's ability to handle the data required. This condition states,

> "Prior to the removal of drilling equipment, sump fluids (base mud and supernatant liquids) shall be chemically analyzed, upon request from the Planning Department, for type and quantity of biologically sensitive materials, especially hazardous materials, heavy metals and acids. The chemical analysis shall be sent to the California Regional Water Quality Control Board and Lake County Planning Department for review. If said analysis does not indicate quantities in excess of allowable limits for either human or other important biological elements, especially those of the aquatic ecosystem, then sump materials shall be solidified, dried, mixed with native soil, and buried. If hazardous or biologically sensitive materials are found, such materials will be removed to a Class 2-1 or Class 1 disposal dump site as directed by the County or appropriate state agency."

The County may also wish to consider a more specific requirement such as Napa County's which states, "All trash, including cans, bottles, sacks and other paper products, will be picked up and removed before the rig leaves the hold locations."

25. Monitoring and Inspection

The County's standard conditions (#6, 22 &23) which cover reimbursement to the County for costs incurred in inspecting and monitoring compliance, access to the property, the design engineer's responsibilities, and participation in ambient air and/or water monitoring programs appear to be adequate.

26. Level of Performance

The County's standard condition (#3) that refers to mitigation measures contained in the EIR and the clause regarding the design engineer's responsibility for certifying that the project has been completed according to plans appear to be adequate. Although with regard to the former, as far as review and implementation of the conditions is concerned, it might be better to specifically list the mitigation measures rather than deal with them by reference to the EIR.

The following standard County condition (#7) seems particularly abstruse:

> "The Planning Director shall have the authority to require the applicant to eliminate, reduce, or otherwise control well emissions to reduce adverse effects that cannot be eliminated or adequately controlled to the satisfaction of the Planning Director, by the regulation of any other public agency or agencies having permit authority over emission levels."

This condition might be more clearly stated.

Conditions:

1. It is agreed that the application of CEQA pertains to the evaluation of the environmental effects of the entirety of a project. In the development of geothermal resources, the entirety of the project from the first exploratory well to the power plant and transmission lines evolves piecemeal, and there is at the beginning no description of the final form of the project.

   As a consequence of the uncertainties involved, it should be clearly understood that approval of this or any other single permit in no way implies approval of any other future permits dealing with other aspects or other parts of the total endeavor of geothermal energy development on this lease.

2. This permit is limited to the establishment of six (6) drilling pads designated as Well Sites A, B_1, B_2, C, D, and E in the EIR, and the drilling of a total of six (6) wells on said pads.

3. The establishment of the pad, and the drilling and operation of the well, shall follow the appropriate mitigation measures as recommended on Pages 3, 26-30b, inclusive; 39-44, inclusive; 46-47, inclusive; 51; 54; 56; 59-60, inclusive; 63; 68-71, inclusive; 74; 99-103, inclusive, of the Final EIR for the project, and as required by the Planning Director. All activities pursuant to this Use Permit shall be conducted in such a manner as to prevent or minimize adverse environmental impacts. All equipment and techniques applied to the mitigation of noise and well emissions or discharges shall perform to a level equal to or better than any other existing method.

4. Prior to development of the drill pad, a Grading Permit shall be secured from the County Building Department and detailed Site Plans, including construction standards, shall be submitted to the Planning Director for approval and that prior to the development of road access to any pad site, a detailed Road Plan, including construction standards, shall be approved by the Planning Director, and a Grading Permit obtained from the Building Inspecttion Department. Construction work shall be conducted in dry weather and all of said plans shall be subject to approval by the Sonoma County Water Agency.

5. The operator must give evidence to the Planning Director prior to the commencement of each phase of operation that he will use the most feasibly effective muffling equipment currently available in all phases of well drilling, cleanout, bleeding and testing so that the noise level specified under this condition may be insured.

   The noise levels produced during the drilling or operation of any geothermal well shall comply with the standards set forth below:

   a. The term "Development" phase as used herein shall apply to all activities occurring from the spudding of a well to the time when the geothermal energy so produced is sold or otherwise applied to a commercial use, and shall, also, include well maintenance requiring a drilling rig during the "Operational" phase.

b. The term "Operational" phase shall apply to all those activities other than development activities, except for rig maintenance of a production well as specified in (a) above.

c. The operator shall exercise continuous care and diligence in all operations so as to minimize sound emissions, and will select and use the most effective equipment, procedures, and methods currently available so as to assure compliance with this permit. Said measures shall include the selection of pad sites which are naturally screened, when such an alternate is feasible; the construction of artificial screens, baffles or other devices; and the proper orientation of sound production equipment.

6. The work or activities done or conducted under this Use Permit are subject to the conditions and standards of permits or certificates issued or approved by the State Division of Oil and Gas, the North Coast Regional Water Quality Control Board, and the Northern Sonoma County Air Pollution Control District. Any violation or non-compliance as to any provision of such permit or certificate shall constitute a violation of this Use Permit. Applicant shall participate in any ambient air and/or water monitoring program required by the County or any of the aforementioned agencies; provided that the cost to the applicant of such participation shall be limited to $5,000 for each well and the monitoring program is commenced within three (3) years after the spud in date of each well. The County will avoid the duplication of monitoring activities of other agencies.

7. The Planning Director shall have the authority to require the applicant to eliminate, reduce, or otherwise control well emissions to reduce adverse effects that cannot be eliminated or adequately controlled, to the satisfaction of the Planning Director, by the regulation of any other public agency or agencies having permit authority over emission levels. Adverse effects include but are not limited to the effect of noise and odor on persons, property, wildlife or vegetation in the vicinity of the wells. The applicant agrees to comply with any reasonable requirements of the Planning Director to eliminate, reduce, or control said adverse effects.

8. The boundaries of the designated drilling pad and access road right-of-way shall be clearly marked, and no construction or transport equipment shall be permitted beyond the prescribed boundaries of said pad and road right-of-way.

9. All cut and fill slopes of the drill pad and access road, and such adjacent slopes that have been disturbed in construction of said facilities, shall be stabilized and reseeded to prevent erosion, and such work shall be completed prior to the onset of fall rains or as otherwise recommended in the EIR.

10. All areas which are reseeded or reforested shall be protected from grazing animals.

11. A disposal site or sites for sump contents and other waste materials to be disposed of from the site shall be provided as required by the County, the Regional Water Quality Control Board and the State Solid Waste Disposal Board.

12. All sumps and/or ponds shall be purged of environmentally harmful chemicals, back-filled, and compacted to the specification of the working portion of the pad, and reseeded if required by the Planning Director at the time of removal of the drilling rig from the site.

13. The applicant shall comply with requirements of fire prevention practices and measures as prescribed by the Division of Forestry in the County of Sonoma, including arrangements for access by fire fighting equipment to subject property, and shall file with the said Division of Forestry a Fire Protection and Prevention Plan.

14. Sanitary facilities shall be provided for workers at the drill site as required by the Sonoma County Health Department.

15. When the well is completed or abandoned, all denuded area on and around the drilling site shall be reseeded and/or reforested in accordance with the recommendations of the EIR, or as otherwise required by the Planning Director.

16. All unattended drilling equipment, well heads, sumps, ponds and other hazardous equipment or facilities, shall be protected from access by unauthorized persons.

17. After cessation of drilling, all drilling equipment and excess materials shall be removed from the site within 30 days, including any residue from drilling except that the Planning Director, for good cause, may extend the time for compliance beyond 30 days.

18. Prior to any construction or drilling, the applicant shall post a bond for each well authorized under this Use Permit to assure faithful performance of conditions of the Permit. The bond is to be made payable to the County of Sonoma in the amount of not less than ten thousand dollars ($10,000), of which $3,000 shall be cash. The cash bond of $3,000 may be in the form of certificates of deposit or similar guarantees of cash payment to the County, which guarantees cannot be revoked, withdrawn or cancelled by the applicant without approval of the Board of Supervisors. Requests by the County for payments from the cash bond fund shall be in the form of a resolution adopted by the Board of Supervisors. The Board of Supervisors may authoirze a cash bond, in whole or part, to be replaced by a surety bond in the same amount, when the Planning Director determines and recommends to the Board of Supervisors that the conditions of this Use Permit have been satisfied to the extent that a surety bond would adequately protect the County. The aforesaid performance bond or bonds for any single lease block shall not exceed a total amount of fifty thousand dollars ($50,000), of which not to exceed fifteen thousand dollars ($15,000) may be cash.

19. This Use Permit shall not become valid or effective until it is signed by the applicant. This Permit shall expire one year from the date of approval by the Board of Supervisors except that one extension of time up to one year may be granted pursuant to the provisions of Section 26-207.1 of the Sonoma County Zoning Ordinance.

20. Mitigations recommended in the EIR to protect the archaeological resources shall be followed. If archaeological resources not identified in the EIR are encountered, construction will be halted, and appropriate mitigation employed, subject to Planning Director approval.

21. No construction activities shall occur in the immediate vicinity of any spring, nor shall they be conducted in a manner which will interfere with the flow or discharge of any spring or natural water course.

22. The applicant shall fully reimburse County for all costs incurred by the County in inspecting and monitoring compliance with the conditions of this Permit and County Ordinances. The applicant shall reimburse County within 30 days after County sends its bill to applicant for costs incurred.

23. The applicant shall grant unrestricted access of his property to County representatives or to consultants or contractors hired by the County for inspection, enforcement, or mointoring activities deemed desirably by the County; the applicant shall designate an individual who is to be available at all times for purposes of supplying information and responses deemed necessary by authorized County representatives in connection with such work.

24. Noise levels shall not exceed 65 dBA at the leasehold line; nor shall they exceed 65 dBA between 7:00 a.m. and 10:00 p.m. or 45 dBA between 10:00 p.m. and 7:00 a.m. as determined at any neighboring residential premises.

25. Sanitary and handwashing facilities and a drinking water source satisfactory to the Public Health Officer shall be provided at the drill site.

26. Prior to issuance of any Building or Grading Permit, an application for waste discharge requirements shall be submitted to the North Coast Regional Water Quality Control Board.

27. If these wells are developed as steam producers, a radio activity surveillance program satisfactory to the Radiologic Health Section, California Department of Health, shall be established.

28. Prior to commencement of any excavation for road, well site construction, or drilling, an Authority to Construct shall be obtained from the Northern Sonoma County Air Pollution Control Officer.

29. Construction and operation of these wells shall not cause any federal or applicable state ambient air quality standard to be exceeded or be in violation of any district rule or regulation.

30. The California Department of Forestry will require that all mechanical equipment meet the requirements of the Public Resources Code in regard to spark arrestors, fire tool requirements, etc.

31. The California Department of Forestry also requests that representatives from Thermogenics and/or Aminoil contact the local California Department of Forestry to develop a plan for removal of the wildland fuels that will fulfill burning regulation requirements and incorporate fire prevention measures to be taken.

32. Drainage improvements shall be designed by a civil engineer in accordance with the Water Agency's Flood Control Design Criteria for approval by the Chief Engineer of the Sonoma County Water Agency and shall be shown on the improvement plans.

33. All conditions of this Use Permit are necessary to protect the general health, safety, and welfare, and to minimize or eliminate adverse environmental effects of the project. If any condition to this permit is held invalid by a court, then the entire permit shall be invalid. The Board of Supervisors specifically declares that it would not have issued this Permit unless all of the above conditions are attached.

34. This permit shall be subject to revocation or modification by the Board of Zoning Adjustments if: (a) the Board finds that there has been non-compliance with any of the foregoing conditions or (b) the Board finds that the use for which this permit is hereby granted is so exercised as to be substantially detrimental to persons or property in the neighborhood of the use. Any such revocation shall be preceded by a public hearing noticed and heard pursuant to Sec. 26-225 of the Sonoma County Code.

ADDENDUM TO CONDITIONS

The Design Engineer contracted to perform the engineering geology and site design shall be responsible for the inspection of all construction procedures involving grading, compaction, drainage improvements, and site revegetation.

The Design Engineer shall certify to the County of Sonoma that the project has been completed according to the approved engineering plans, and the conditions attached to any and all permits issued for the purpose of Geothermal Development, County of Sonoma.

COUNTY OF LAKE

USE PERMIT

McCULLOCH BOTTLEROCK STEAMFIELD GEOTHERMAL PROJECT

Pursuant to the approval of the Lake County Board of Supervisors on February 19, 1980, there is hereby granted to McCulloch Geothermal Inc., 10880 Wilshire Boulevard, Los Angeles, CA., a Use Permit for the Cobb Valley area, for a maximum of ten additional wells to be drilled on three pads, the existing Francisco, existing Coleman and proposed Pad #3 as identified in the Final E.I.R., and for accessory access roads and pipelines, including three injection wells to be located in Sections 5 and 6 T11n., R8W, MDB&M, in accordance with the Lake County Ordinance Code.

The Board of Supervisors finds that the establishment, maintenance or operation of the use for which application is made will not under the circumstances of this particular case be detrimental to the health, safety, peace, morals, comfort and general welfare of persons residing or working in the neighborhood of such use, or be detrimental to the general welfare of the County and that the proposed use is not a trival action with no significant impact on the environment.

The Planning Commission has caused to be prepared an Environmental Impact Report on the subject of this application and has held public hearings thereon and has carefully considered this matter pursuant to the California Environmental Quality Act and the State E.I.R. Guidelines pertaining thereto, and pursuant to the Environmental Protection Guidelines of the County of Lake.

1. Approval is subject to the following terms and conditions:

   1. The Use Permit shall be valid for a period of three (3) years from the date of approval; however, if the Use Permit is not used prior to February 19, 1983, it will become null and void, and the use may not proceed without the application for and approval of a new Use Permit. The Planning Commission may in its discretion approve time extensions.

   2. The County reserves the right to inspect this project at any time after first attempting to notify the operator.

   3. The Use Permit shall be reviewed by the Planning Commission at the end of eighteen (18) months and shall be subject to the following conditions:

   A. TO PROTECT PLANT ASSOCIATIONS:

      1. Specified pad, road, and borrow sites shall be evaluated by a qualified landscape architect, registered forester, plant ecologist or qualified person acceptable to the Planning Department and applicant, to determine which native plants should be replanted, which annual grasses shall be seeded and which non-native plants can be tolerantly sustained.

      2. Top soil shall be stockpiled for later respreading over the disturbed areas prior to re-seeding.

      3. When construction/drilling has been completed, revegation shall be programmed and shall commence in the fall following the construction. The revegetation program shall be directed by the landscape architect, registered forester, plant ecologist or other qualified person acceptable to the Planning Department and applicant.

      4. The entire revegetation program shall be re-evaluated during the spring following initial

planting and, if deemed by the Planning Department to be unsuccessful, additional regevetation will be required in the immediately succeeding fall season.

5. Except for large stumps, vegetation removed during construction shall be chipped and respread when beneficial as determined by person in Section A-1, or burned under the permits required by the Lake County Air Pollution Control District. Stumps may be buried outside of engineered fill and embankments.

6. In order to protect riparian and fen areas, as well as other vegetation on the leasehold, access to the drill-sites shall be restricted to existing roads and proposed roads as defined in the application.

7. Vegetation beyond the construction perimeter shall not be disturbed. The clearing limits for the pad shall be specified in the plans and specifications to be submitted for approval to the Planning Department.

8. TO PROTECT AGAINST EXCESSIVE SOIL EROSION, INDUCED LANDSLIDES AND SURFACE GEOLOGIC HAZARDS:

1. Plans for drill pads, steam transmission pipelines, sumps and access roads shall be prepared by a registered civil engineer with assistance from a registered engineering geologist. Topographic mapping by photogrammetric methods shall be used for design and be supplemented as necessary with ground surveys. Road, pipeline, and pad locations shall be staked on the ground and adjusted as necessary before completion of final plans. Plans shall include a separate drainage plan using five foot contour intervals and supporting calculations for culvert sizes using acceptable engineering methods. Plans shall show specific provisions for erosion protection along pipeline routes, at culverts and on cut and fill slopes. detailed specifications for construction should be prepared in a manner similar to applicable portions of "Forest Service General Provisions and Standard Specifications for Contruction of Roads and Bridges-1977" and "Regional Standard Specifications", a U.S.D.A. Forest Service. Plans, specifications and ground locations shall be approved by the Planning Department or their authorized representatives before starting construction, and shall also be approved by the Regional Water Quality Control Board prior to construction.

2. Drill pad and road fills shall be compacted to a minimum 90% relative compaction to minimize erosion. If significant erosion occurs as a result of any part of this project, applicant shall take prompt remedial action.

3. Filled slope banks shall not exceed a gradient of 2:1. Toes of all fills shall be stabilized with rock and gravel or keyed into stable soil and placed to reduce erosion potential to an absolute minimum on all fill slope banks. Revegetation of slopes shall be carried out as specified in Condition A. Unless approved by an engineering Geologist and Planning Department, cut slopes shall not exceed a gradient of 1½:1.

4. Subdrains shall be provided under all fills where natural drainage courses and seepage are evident.

5. No drill pad construction or access road shall be allowed on potentially active landslides, unless properly mitigated, subject to approval by the Planning Department.

6. Buffer zones of undisturbed vegetation shall be maintained 500 feet on either side of streams. No geothermal related construction shall take place within this buffer zone without specific approval from the Lake County Planning Commission. Roads crossing riparian areas shall be minimum safe widths.

7. A retaining levee of not less than eighteen (18) inches in height and three (3) feet in base thickness shall be placed on the perimeter of all fill areas including access road fills, pad site and reserve pit sites, to prevent storm runoff accumulation from random discharge.

8. Drainage plan to be submitted will distribute storm water runoff and channel it to existing natural waterways only to the extent that it will not increase water head to the point of unnatural channel abrasion. Energy dissipators and collection devices to reduce the erosion force of unnatural runoff will be required where determined by County or State Agency Representatives.

9. All grading activity shall be completed and all drainage structures shall be in place and operational prior to October 10 of any year. Grading and excavation activity may not be permitted during the consecutive period from October 10 to April 10. (It is understood that this is a general time frame. Extension beyond October 10 may be allowed by the Lake County Planning Director upon establishment of a suitable soil moisture specification for any stated activity).

10. Applicant shall agree to contract with the County of Lake for engineering and inspection services, as required, to a completion date agreed upon by the applicant and the County, to insure compliance with the above stated conditions. Such services shall be billed to the applicant and repayment by the applicant shall be deposited in the Lake County Geothermal Trust Fund.

11. In areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion.

C. ENVIRONMENTAL AND SAFETY PROTECTIONS:

1. The sump shall be designed by a registered civil engineer with assistance from a registered engineering geologist. Design of the sump fill shall be to a specification to withstand both static loads and dynamic loads (imposed by credible seismic events) with safety factors of 1.5 and 1.2 respectively. The sump shall be constructed of material compacted to minimum 95% relative compaction unless the Lake County Planning Director determines, based upon conclusive soil testing data, that a lesser compaction is adequate. The sump shall be lined with at least two feet of clay having a permeability not to exceed 1×10^{-6} cm./sec., or an equivalent impermeable membrane. Volume of the sump shall be sufficient to accommodate both the drilling mud and any reasonable amount of precipitation which could enter the sump.

2. The sump shall be operated in such a manner as to preclude overtopping of the sump. Three feet of free board shall be maintained at all times.

3. Applicant shall prepare a viable contingency plan for spills and emergency pumping of the sump in the event of a heavy, unexpected rainfall or if excessive geothermal fluids are encountered. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of construction.

4. Applicant shall prepare a viable contingency plan for emergencies due to breaks or unexpected deformation of the pipeline or its supports. The plan shall show who is responsible and what equipment and manpower is available to respond to such an emergency. The plan shall be submitted to the Lake County Planning Department prior to commencement of testing or operations, and annually updated on anniversary of permits.

5. Prior to the removal of drilling equipment, sump fluids (both mud and supernatant liquids) shall be chemically analyzed, upon request from the Planning Department, for type and quatity of biologically sensitive materials, especially hazardous materials, heavy metals and acids. The chemical analysis shall be sent to the California Regional Water Quality Control Board and Lake County Planning Department for review. If said analysis does not indicate quantities in excess of allowable limits for either human or other important biological elements, especially those of the aquatic ecosystem, then sump materials shall be solidified, dried, mixed with native soil and buried. If hazardous or biologically sensitive materials are found, such materials shall be removed to a Class 2-1 or Class 1 disposal dump site as directed by the County or appropriate State Agency.

6. No hydrocarbon base cleaning agent, no waste oils or greases, and no liquid fuel shall intentionally be released directly onto the surface of a drill pad. All such liquids shall be contained and removed from the site. Any accidental discharge of the materials mentioned above shall be removed and properly disposed of by the applicant.

7. All unattended drilling equipment, well heads, sumps and ponds shall be protected from access by unauthorized persons by minimum 6 ft., locked, chain-link fencing.

8. Pipeline components which are exposed to ambient conditions at a temperature of 140 degrees fahrenheit or higher, where accessible to human reach, shall be designed to mitigate against inadvertent human burn injury.

9. Sanitary and hand washing vacilities shall be provided at the drill site and as specified by the Lake County Health Department.

10. In the event of casing blowout or other uncontrolled venting, the applicant shall move immediately to control the vent. No more than two (2) days shall elapse from the date of the uncontrolled vent to the date of equipment relocation to secure it.

11. Well discharge shall be directed away from adjacent woody vegetation and populated areas and appropriate energy dissipators shall be used as required by the Planning Department.

12. All solid waste material shall be removed from the site. Upon completion of drilling operations, unless otherwise approved by Planning Department, all equipment and materials unnecessary to the operation of the completed well shall be removed within sixty (60) days of completion of the well.

13. Applicant shall comply with the requirements of the fire prevention practices and measures as may be prescribed by the California Division of Forestry and/or County of Lake.

14. Provision shall be made for adequate sccess by fire-fighting equipment to the site, and fire access maps shall be provided to the appropriate Fire District (s).

15. Lights in the drilling rig shall be shielded so as to minimize visual impact at night to the portion of Bottlerock Road from which the drilling mast is visible.

16. Applicant shall provide the Planning Department with a plan which details the equipment and procedures which will be employed during powerplant outages (stacking periods) and during maintenance venting. This plan shall include proposed hours during which planned maintenance venting will occur as well as projected time which will elapse between unscheduled power plant outages and the throttling back of wells to minimum bleed. The plan shall include personnel available for unscheduled outages and projected response time of those personnel.

17. Applicant shall submit for the Planning Commission's approval a traffic control and road maintenance plan for High Valley Road. This plan shall take into account the great increase in heavy truck traffic which will accompany full field development of the Bottlerock site. The plan shall suggest mitigations which will prevent or alleviate the concomitant increase in danger due to traffic accidents and damage to the road which may occur following development.

18. Pipeline routes and design must be approved by the Planning Department prior to construction.

19. Prior to any construction activities, the applicant shall provide to the Planning Department for its approval a complete plan of development, showing locations of wells, pads, sanitary facilities, temporary and permanent storage and construction areas and buildings and the means by which these areas will be protected from unauthorized entry.

D. TO PROTECT AGAINST SURFACE WATER DEGRADATION:

1. In order to preserve the hydrologic integrity of this leasehold area applicant shall obtain by right or purchase all water used in drilling process or dust control.

2. The equipment service and fuel transfer areas and the area occupied by the drilling rig shall drain into the sump.

3. All fluids produced during testing after the sump has been filled shall be containerized and removed to a Class 1 or Class 2-1 disposal site, if required by the Planning Department or State Agencies.

4. The applicant shall continue to monitor the surface water quality of Kelsey and High Valley Creeks as required by the McCulloch Francisco Use Permit, and shall coordinate this water quality monitoring program with the ongoing California Department of Water Resources Water Quality Monitoring Program, said coordination being subject to approval by the Planning Department. Yearly microfaunal studies shall be initiated at times and locations specified in the McCulloch Department of Water Resources Bottlerock Steam Field EIR. Sampling procedures and parameters shall conform to those procedures and parameters outlined in the section entitled "monitoring", on pages 123 and 124 of that EIR.

5. If the applicant elects to conduct or participate in a larger and more comprehensive water quality program, it can be substituted for the requirements of D4. Such a proposal must be submitted to and accepted by the Planning Department and begun prior to the commencement of construction activities.

E. TO PROTECT AIR QUALITY:

1. Applicant shall meet all regulations and standards set

by the Lake County Air Pollution Control District and utilize on a continuous basis the state of the art of H_2S technology. This Use Permit does not supersede the authority of said District in any way.

2. After completion of geothermal wells, the H_2S emissions during standby venting of steam shall be either abated to acceptable level per Air Pollution Control District rules and regulations or standby venting shall be curtained to that level necessary to attain emission limitations. Curtailment methods to be utilized shall include the shutting in of geothermal wells as publicly agreed to by the applicant.

3. Applicant shall minimize vehicular dust on unpaved roads by the use of water or other acceptable dust retardant.

4. Applicant shall provide accurate chemical analysis of the geothermal resource if it is encountered, when required by the Air Pollution Control District.

5. The analysis shall include accurate "wet chemistry" and gas chromatograph determinations. Heavy metals such as lead, chromium, arsenic, antimony, mercury and cadmium should be determined as well as substances such as radon, hydrogen sulfide, boron, manganese, methane, fluoride, ammonia and carbon dioxide. The analysis should also include pH. The chemical analysis will be used in future use permit consideration for geothermal development on the project leasehold. The analysis shall be sent to the Planning Department within 45 days of completion of the well.

6. Applicant shall enter into agreements with Department of Water Resources or other parties as necessary and provide a written commitment and preliminary design of abatement systems as described in a letter dated February 15, 1980 from Ronald Robie, Director Department of Water Resources, to Lake County Air Pollution Control District which is acceptable to the Lake County Air Pollution Control District prior to all construction.

F. TO PROTECT AGAINST NOISE EXPOSURE:

1. Applicant shall meet a noise standard of Ldn 55 db (A) with a 10 db penalty between the hours of 10 P.M. and 7 A.M. of the following day at residences.

2. If measurements by the Planning Department indicate a possible violation of F.1, a measurement of the source noise in an appropriate location in the immediate vicinity of the source shall be made to determine if the source noise is sufficient to cause the level measured at F.1 to exceed 55 Ldn using the inverse square law. This source measurement shall be an equivalent sound level (Leq) averaged over a 24 hour period.

3. These regulations shall be adopted until a noise control ordinance is approved by the Board of Supervisors. Applicant agrees that the Planning Commission shall have the right to substitute the conditions of a General Noise Control Ordinance for the conditions of this section when adopted by the Board of Supervisors. It is understood by the Planning Commission and applicant that mufflers of advance design will be required for almost all geothermal operations in order to meet these standards and that extraordinary mitigative techniques such as lead/vinyl barriers and the wrapping of the drill rigs may be necessary to meet the noise standards of Section F-1 and F-2.

4. It is stipulated that the Lake County Planning Department will be spot monitoring noise levels in the vicinity of the proposed land use and that findings resulting from said monitoring may require the applicant, his contractors or agents to provide continuous noise level monitorings and readings as may be directed by the Planning Department.

5. It is also stipulated that the Planning Department has jurisdiction over noise investigation procedures and enforcement.

6. If the Planning Department receives noise complaints, the hours of heavy truck traffic to and from the site may be restricted to the hours between daylight and sunset only; except in cases of emergency.

7. Drill pipes shall not be laid in bins between the hours of 8 P.M. and 7 A.M. the following day.

G. TO PROTECT ARCHAEOLOGICAL RESOURCES:

1. Archaeological sites identified on pages 125-127 of the McCulloch Department of Water Resources Bottlerock Steamfield EIR shall be preserved in their existing state. No excavation or disturbance by the applicant or his contractors shall be permitted at these archaeological sites unless mitigated, subject to approval by the Planning Department and Sonoma State University's Resources Facility.

H. TO CONTROL VISUAL IMPACTS:

1. The revegetation program shall be formulated to include consideration of the visual impacts created by geothermal development.

2. Pipelines shall be colored in such a manner as to provide maximum color compatability with the vegetation type tyrough which it is routed. The choice of the color of the pipeline shall be made by the revegetation program contractor. Changes in color shall be made along the pipeline if necessary to blend with the background.

3. On visual edges such as ridgelines, low profile design approaches shall be employed.

4. All pad/road/pipeline sites shall be placed in areas, other environmental and engineering conditions being met, in such a manner that existing vegetation and topography will provide maximum screening.

I. UPON WELL ABANDONMENT:

1. The applicant shall abandon any well in accord with the Division of Oil and Gas Regulations.

2. Applicant shall refill sump and grade pad to reasonably restore a natural ground contour.

3. Applicant shall remove all pipelines and supports not necessary for field operation.

4. Applicant shall revegetate the pad and sump areas with woody vegetation that can be tolerantly sustained in accord with recommendations of the revegetation consultant or the procedure given in Condition A-1.

J. RE-ENTRY OF PRODUCTION OR SUSPENDED WELL BORES:

1. Applicant may re-drill or otherwise re-enter the same well bore of any well authorized under this Use Permit during the life of this project as long as all conditions of the Use Permit are met.

K. SEVERABILITY:

If any section, subsection, sentence, clause or phrase of this permit is for any reason held by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the remaining portions of the use permit. The Board of Supervisors hereby declares that it would have passed this use permit and each section, subsection, sentence, clause and phrase hereof irrespective of the fact that any one or more sections, subsections, clauses or phrases are declared invalid.

II. IN GRANTING THIS USE PERMIT, THE LAKE COUNTY BOARD OF SUPERVISORS MAKES THE FOLLOWING FINDINGS:

A. That this Use Permit does not abridge or supersede the regulatory powers or permit requirements of any State or Federal Agency or any Special District or other Lake County Department or Division which may retain an advisory or regulatory function as specified by statute or ordinance, nor does this Use Permit grant any title or other real property solely to this applicant or his assigns.

B. That the granting of this Use Permit is in the general public interest and that environmental and performance parameters conditioning the proposed activity as specified in this Use Permit and as contained in that document entitled "Conditions, Procedures and Performance for Geothermal Regulations, County of Lake" now referenced and made a part hereof, will allow the proposed activity with adequate safeguards to the welfare of the people of Lake County at large and to the people residing in the vicinity of said activity.

C. That this Use Permit shall be subject to revocation or modification by the Board of Supervisors of Lake County if:

1. The Board finds that there has been non-compliance with any of the foregoing conditions or:

2. The Board finds that the use for which this Use Permit is granted is so exercised as to be substantially detrimental to the general public or to property in the vicinity of the use.

Any such revocation shall be taken pursuant to Section 21-84 of the Ordinance Code of the County of Lake.

D. Noise levels from drilling operations will be muffled and times of other operations limited so as not to constitute a public nuisance.

III. THE BOARD OF SUPERVISORS FURTHER DECLARES THAT:

A. This Use Permit may be modified or revoked if the Lake County Board of Supervisors finds that the use to which this permit is put is detrimental to the health, safety, morals, comfort and general welfare of the persons residing or working in the neighborhood of such use, or

If it is injurious or detrimental to property and improvements in the neighborhood or the general welfare of the County, or is a nuisance.

Date of Issuance:

GEORGE R. VOLKER
Planning Director

By: _____
Irene L. Brown, Secretary

ACCEPTANCE

I have read and understand the foregoing Use Permit and agree to each and every term and condition thereof.

Date: _____

_____
Owner or Authorized Agent

DP;lds