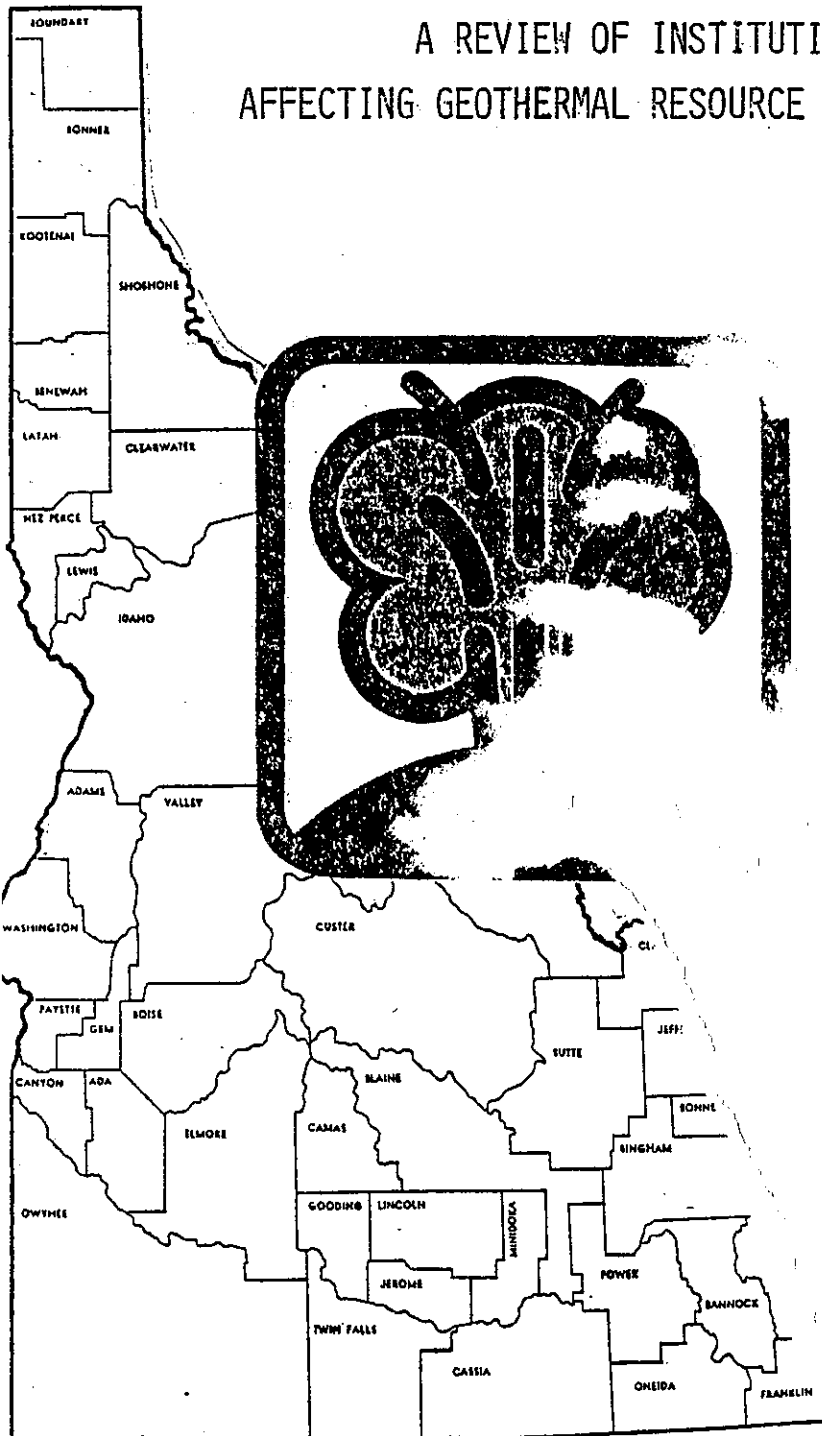


Idaho Geothermal Report

A REVIEW OF INSTITUTIONAL FACTORS
AFFECTING GEOTHERMAL RESOURCE DEVELOPMENT IN IDAHO

BY
DAVID W. McCLAIN



IDAHO OFFICE
Office of the G

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IDAHO OFFICE OF ENERGY
OFFICE OF THE GOVERNOR

Prepared for the United States Department of Energy,
Division of Geothermal Energy, Idaho Falls Operations Office

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1.0 Introduction

This report is an analysis of the role of government regarding geothermal resource development in Idaho. The influence of local, state and Federal government activities on geothermal development were examined for institutional steps, barriers, and current status. Local government activities were inventoried regarding local land use planning, zoning and building ordinances.

The role of state government was analyzed regarding:

1. the potential for conflict between geothermal development in Idaho Water Law;
2. state land leasing activities;
3. the role of the Public Utilities Commission;
4. state tax structures regarding resource development.

The federal geothermal leasing program was analyzed regarding the current status of leasing activity and the time factors involved in acquiring a lease.

Oil and gas exploration and leasing activities in Idaho were reviewed to compare those activities with exploration and leasing for geothermal resources in Idaho.

2.0 Local Government Planning

The Local Planning Act of 1975 (Idaho Code 67-6509) provides authority to cities and counties to regulate land use development through the use of zoning, subdivisions, planned unit development, or other separate ordinances.

This report establishes the current status of local planning and zoning ordinances in Idaho's cities and counties. Geothermal resource development in Idaho will have to comply with local planning and zoning. The information herein was compiled from local information sources and the State Bureau of Community Affairs. This information is subject to constant change and it is therefore recommended that up-to-date information be solicited from individual cities and counties.

All counties in Idaho are members of regional councils. These regional councils coordinate planning assistance and development activities for local governments. Table 2.0 lists the addresses of the regional planning councils.

2.1 Local Planning Inventory

The following seven local planning items were inventoried by the State Bureau of Community Affairs, for all local planning jurisdictions in Idaho:

1. Does the jurisdiction have a planning and/or zoning commission?
2. Is the jurisdiction served by a regional council?
3. Does the jurisdiction have a comprehensive plan?
4. Does the jurisdiction have a zoning ordinance?
5. Does the jurisdiction have a subdivision ordinance?
6. Does the jurisdiction have a building code?

Each city and county in the state was contacted by the Idaho Office of Energy in order to update this information to the current "state of the art." Table 2.1 lists the cities and counties in relationship to the planning region in which they are located. In State Planning Region I and Region II only those counties and cities with geothermal resources were inventoried. In all remaining state planning regions, all cities and counties were inventoried.

TABLE 2.0

Regional Councils

Region 1 PAC	Panhandle Area Council Box 880; Wiggett Building; 3rd Floor 4th & Sherman Coeur d'Alene, ID 83814 (208) 667-1556
Region 2 CEDA	Clearwater Economic Development Association Box 8636 Moscow, ID 83843 (208) 882-3470
Region 3 IDA-ORE	IDA-ORE Regional Planning & Development Administration P.O. Box 311 25 West Idaho Street Weiser, ID 83672 (208) 549-2411
APA	Ada Planning Association 105 North Capitol Boulevard P.O. Box 500 Boise, ID 83701 (208) 384-4310
Region IV RIVDA	Region IV Development Association 725 Shoshone St. South Twin Falls, ID 83301 (208) 734-6586
Region V SICOG	Southeast Idaho Council of Governments Box 4169 403 N. Main St. Pocatello, ID 83201 (208) 233-4032
Region VI ECIPDA	East Control Idaho Planning & Development Association, Inc. P.O. Box 330 12 North Center Rexburg, ID 83440 (208) 356-4524

TABLE 2.1

Local Planning Inventory

Key to Symbols

P	- Currently proposed
D	- In development stage
X	- Existing
Id.	- Identified
In.	- Interim
PAC	- Panhandle Area Council
CEDA	- Clearwater Economic Development Association
APA	- Ada Planning Association
IDA-ORE	- Ida-Ore Regional Planning & Development Association
RIVDA	- Region IV Development Association
SICOG	- Southeast Idaho Council of Governments
ECIPDA	- East Central Idaho Planning & Development Association, Inc.

<u>Jurisdiction</u>	<u>Planning and/or Zoning Commission</u>	<u>Regional Council</u>	<u>Comprehensive Plan</u>	<u>Zoning Ordinance</u>	<u>Sub-Division Ordinance</u>	<u>Building Code</u>	<u>Area Of City Impact</u>
<u>REGION I</u>							
Shoshone Co.	X	PAC	X	X	X	X	
Kellogg	X	PAC	X	X	X	X	
Osburn	X	PAC	X	X	X		
Mullan	X	PAC	D			X	In.
Wallace	X	PAC	D				
<u>REGION II</u>							
Clearwater Co.	X	CEDA	X	X	X	X	
Idaho Co.	X	CEDA	D		X		
Riggins		CEDA				X	
Grangeville	X	CEDA	X	X	X	X	
Lewis Co.	X	CEDA	X		X	X	
Nez Perce Co.	X	CEDA	D	X	X	X	
<u>REGION III</u>							
Ada Co.	X	APA	X	X	X	X	
Boise	X	APA	X	X	X	X	In.
Garden City	X		D	D	D	X	
Meridian	X	APA	D	X	X	X	In.
Eagle	X	APA	X	X		X	In.
Kuna	X	APA	X	X		X	In.
Adams Co.	X	IDA-ORE	P		X		P
Council	X	IDA-ORE	D		X	X	X
New Meadows	X	IDA-ORE	D		X		X

<u>Jurisdiction</u>	<u>Planning and/or Zoning Commission</u>	<u>Regional Council</u>	<u>Comprehensive Plan</u>	<u>Zoning Ordinance</u>	<u>Sub-Division Ordinance</u>	<u>Building Code</u>	<u>Area Of City Impact</u>
<u>REGION III</u> <u>Continued</u>							
Boise Co.		IDA-ORE			C		
Horseshoe Bend	X	IDA-ORE					
Crouch		IDA-ORE					
Idaho City	X	IDA-ORE		D	D		
Placerville		IDA-ORE					
Canyon Co.	X	IDA-ORE	X	P	X	X	X
Caldwell	X	IDA-ORE	X	X	X	X	X
Nampa	X	IDA-ORE	X	X	X	X	X
Parma	X	IDA-ORE	X	X	D	X	X
Notus	X	IDA-ORE	P			X	X
Melba	X	IDA-ORE	P			X	X
Middleton	X	IDA-ORE	X	X	X	X	X
Wilder	X	IDA-ORE	P			X	X
Greenleaf	X	IDA-ORE	P			X	X
Elmore Co.	X	IDA-ORE	X		X	X	P
Glenns Ferry	X	IDA-ORE		X			P
Mountain Home	X	IDA-ORE		X	X	X	P
Gem Co.	X	IDA-ORE	X	X	X	X	P
Emmett	X	IDA-ORE	X	X	X	X	X
Owyhee Co.	X	IDA-ORE	X		D		
Homedale	X	IDA-ORE	P		D		
Marsing	X	IDA-ORE	P		D		
Grandview	X	IDA-ORE	P		D		
Payette Co.	X	IDA-ORE	X	X	X	X	
Fruitland	X	IDA-ORE	X	X	X	X	X
New Plymouth	X	IDA-ORE	X		X		
Payette	X	IDA-ORE	X	X	X	X	P
Valley Co.	X	IDA-ORE	X	D	X	X	
McCall	X	IDA-ORE	X	X	X	X	P
Donnelly	X	IDA-ORE	X				P
Cascade	X	IDA-ORE	X	X	X	X	P
Washington Co.	X	IDA-ORE	X	P	X	X	
Weiser	X	IDA-ORE	X	X	X	X	X
Midvale	X	IDA-ORE	X				X
Cambridge	X	IDA-ORE	X	X	X		X

REGION IV

Blaine Co.	X	RIVDA	X	D	D	X	
Hailey	X	RIVDA		X	X	X	P
Ketchum	X	RIVDA	X	X	X	X	P
Sun Valley	X	RIVDA	X	X	P	X	P
Bellvue	X	RIVDA		X			P
Camas Co.	X	RIVDA	X	X	X	X	
Fairfield	X	RIVDA					X
Cassia Co.	X	RIVDA	X	X	X	X	
Burley	X	RIVDA	X	X	X	X	X
Albion		RIVDA	X	X	X		
Declo	X	RIVDA	X	X	X	X	
Oakley	X	RIVDA	D			X	
Malta						X	

<u>Jurisdiction</u>	<u>Planning and/or Zoning Commission</u>	<u>Regional Council</u>	<u>Comprehensive Plan</u>	<u>Zoning Ordinance</u>	<u>Sub-Division Ordinance</u>	<u>Building Code</u>	<u>Area Of City Impact</u>
<u>REGION IV</u>							
<u>Continued</u>							
Gooding Co.	X	RIVDA	X	D	X		
Gooding	X	RIVDA	X	X	X	X	
Wendell	X	RIVDA	X	X	X	X	X
Bliss	X	RIVDA				X	
Hagerman	X	RIVDA	X			X	X
Jerome Co.	X	RIVDA	D	X	X	X	
Jerome	X	RIVDA	X	X	X	X	
Eden		RIVDA	P	X			
Hazelton	X	RIVDA	P			X	
Lincoln Co.	X	RIVDA	D	D	D	X	
Shoshone	X	RIVDA	X	X	D	X	
Dietrich	X	RIVDA	X	X	D	X	
Richfield	X	RIVDA	X	X	D		
Minidoka Co.	X	RIVDA	X	X	D	X	Partial
Paul		RIVDA	D	X	D	X	X
Rupert	X	RIVDA	X	X	D	X	P
Acequia		RIVDA	D			X	X
Heyburn	X	RIVDA	D	X	X	X	X
Minidoka		RIVDA	D			X	P
Twin Falls Co.	X	RIVDA	X	X	X	X	
Castleford		RIVDA					
Filer	X	RIVDA		X	X	X	X
Hollister	X	RIVDA	X	P			
Murtaugh		RIVDA	X	X	X	X	
Twin Falls	X	RIVDA	X	X	X	X	
Buhl	X	RIVDA		X	X		
Kimberly	X	RIVDA		X	X	X	X
Hansen	X	RIVDA		X	X	X	

REGION V

Bannock Co.	X		X	X	X	X	X
Arimo		SICOG	X	X	X	X	X
Chubbuck	X	SICOG	D	X	X	X	X
Downey	X	SICOG	X	D	X	X	X
Inkom	X	SICOG	X	D	D	X	X
McCammon	X	SICOG	X	X	X	X	X
Pocatello	X	SICOG	X	X	X	X	X
Lava Hot Springs	X	SICOG	X	X	X	X	X
Bear Lake Co.	X	SICOG	D		X		X
Montpelier	X	SICOG	D	X	X	X	Id.
Paris			D				
St. Charles	X	SICOG	X	D	D		D
Fish Haven	X		D				
Bloomington	X	SICOG	D				
Georgetown	X	SICOG	D	X		X	

<u>Jurisdiction</u>	<u>Planning and/or Zoning Commission</u>	<u>Regional Council</u>	<u>Comprehensive Plan</u>	<u>Zoning Ordinance</u>	<u>Sub-Division Ordinance</u>	<u>Building Code</u>	<u>Area Of City Impact</u>
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REGION V
Continued

Bingham Co.	X	SICOG	X	X	X	X	Id.
Aberdeen	X	SICOG	X	X	D	X	X
Blackfoot	X	SICOG	X	X	X	X	X
Shelley	X	SICOG	X	X	X	X	Id.
Atomic City						X	
Basalt							Id.
Firth		SICOG	X	X	X		Id.
Caribou Co.	X	SICOG	X	X			X
Grace	X	SICOG	X	D	X		X
Soda Springs	X	SICOG	X	D	X	X	X
Bancroft	X	SICOG				X	X
Franklin Co.		SICOG					X
Franklin		SICOG	X	X	X		
Clifton							
Dayton	X	SICOG	D	D	X		
Oxford		SICOG					
Weston	D	SICOG				X	
Oneida Co.	X	SICOG	X	D	D		X
Malad	X	SICOG	X	X	D		X
Power Co.	X	SICOG	X	X	X	X	X
American Falls	X	SICOG	X	X	X	X	X
Rockland	X	SICOG	D	D	D	X	X

REGION VI

Bonneville Co.	X		X	X	X	X	Id.
Ammon	X		X	X	X	X	Id.
Idaho Falls	X		X	X	X	X	Id.
Iona	X		X	X	X	X	Id.
Ucon	X		X	X	X	X	Id.
Irwin	X		X	X		X	Id.
Swan Valley	X		X	X	X	X	Id.
Butte Co.	X	ECIPDA	D				
Arco		ECIPDA		X			
Moore		ECIPDA		X		X	
Butte City		ECIPDA					
Clark Co.	X	ECIPDA	D	X	X		
Dubois		ECIPDA				X	
Spencer		ECIPDA					
Custer Co.	X	ECIPDA	D				Id.
Challis	X	ECIPDA	X	D	D		Id.
Mackay	X	ECIPDA	D				
Clayton		ECIPDA					
Stanley	X	ECIPDA	X	X	X	X	Id.

<u>Jurisdiction</u>	<u>and/or Zoning Commission</u>	<u>Regional Council</u>	<u>Compre- hensive Plan</u>	<u>Zoning Ordinance</u>	<u>Sub- Division Ordinance</u>	<u>Building Code</u>	<u>Area Of City Impact</u>
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REGION VI
Continued

Fremont Co.	X	ECIPDA	X		X	D	
St. Anthony	X	ECIPDA	D	X	X	X	
Teton		ECIPDA					
Ashton	X	ECIPDA	P	X			
Drummond		ECIPDA					
Island Park		ECIPDA					
Newdale		ECIPDA					
Parker		ECIPDA					
Warm River		ECIPDA					
Jefferson Co.	X		D		X	X	
Rigby	X		X	X	X	X	
Hamer							
Lewisville							
Menan				X			
Mudlake	X		X	X	X	D	X
Ririe							
Roberts	X		D	D	D	X	Id.
Lemhi Co.	X		D		X	X	
Leadore						X	
Salmon	X		D	X	X	X	
Madison Co.	X		D			X	X
Rexburg	X		X	D	D	X	X
Sugar City	X		X	X	X	X	X
Teton Co.	X		X	D	X		
Driggs	X		D	X			
Victor	X			D	D		
Tetonia							

2.2 City Geothermal District Heating Laws

In March, 1979, the Idaho Legislature passed an act relating to municipal water systems; amending sections 50-323, Idaho Code, to include a definition of domestic uses or purposes.

Section 1 of Senate Bill No. 1062 amended those sections of the Idaho Code which empowers cities to establish and maintain domestic water systems. The term "domestic water system" and "domestic water" was amended to include, by way of example but not by way of limitation, "a public water system providing water at any temperature for space heating or cooling, culinary, sanitary, recreational or therapeutic uses."

Section 2 of the Act amended those sections of the Idaho Code which authorize incorporated cities to issue coupon bonds for the establishment and maintenance of water systems. The Act amended the definition of "water works plant" and "water supply" to include a "a public water system providing water at any temperature for space heating or cooling, culinary, sanitary, recreational or therapeutic uses."

Section 3 of the Act amended the definition of "domestic use or purposes" to include "the use of thermal water at any temperature for space heating or cooling."

Prior to the passage of this act, it was questionable if cities could create and maintain district heating systems. Senate Bill No. 1062 establishes the necessary legal framework which empowers cities to establish, create and maintain geothermal district heating systems and to finance those systems with revenue bonds.

2.3 County Geothermal Heating Law

In March, 1979, the Idaho Legislature passed an act allowing counties to acquire and operate geothermal heating systems; amending sections 31-868 Idaho Code. This bill has limited practical potential because counties cannot go into debt for such systems, unless the Constitution of the State is changed, and, therefore, have no way of financing the construction of a geothermal heating district, except through government grants.

3.0 State Institutional Analysis

3.1 Introduction

Geothermal resource development in the State of Idaho is influenced by those sections of the Idaho Code which 1) regulated the development of water resources, 2) govern the issuance of leases for exploration on State lands, 3) empower the Public Utilities Commission, and 4) tax public and private entities. The following is an overview of state institutional factors which influence geothermal resource development in Idaho.

The most significant impact of geothermal resource development in southern Idaho will be the effect on water. Any geothermal resource development in Idaho will involve some form of consumptive utilization of thermal waters for energy conversion. The potential for discord between geothermal development and water resources is considered the most critical legal conflict facing future geothermal resource development in Idaho.

The State of Idaho recognizes the unique nature of geothermal resources with respect to water and has declared the geothermal resources of the state to be "sui generis". The "sui generis" designation classifies geothermal resources as being neither water nor mineral resources but closely related to and possibly affecting and affected by water and mineral resources. In order to control any possible conflict between geothermal utilization and state water appropriation, the regulatory powers of the state Geothermal Resource Act were placed in the Idaho Department of Water Resources.

3.2 Geothermal Resource Act

Under the Idaho Geothermal Resource Act, any private owner, or holder of a state or federal geothermal lease must first apply to the Director of the Idaho Department of Water Resources for a geothermal resource well permit, before he can drill or alter any well for exploration or production purposes. A filing fee of one hundred dollars (\$100) for a well and fifty dollars (\$50) for an injection well is required with all permit applications. The permit must be secured before drilling can occur.

As a condition of every permit, a bond, indemnifying the State of Idaho is required. The bond, which is not less than ten thousand dollars (\$10,000) for each individual well, must be posted to provide sufficient security conditioned upon the performance of the duties required by the Geothermal Resources Act.

An application for appropriation of public waters must also be made if the proposed well will involve the use of water

in the construction or operation of a geothermal well. For example, water that would be used in drilling a well or used to stimulate a hot but dry well would have to be appropriated from some other source. An application for appropriation must also be made if the geothermal well will yield water that will have a beneficial use. Any consumptive use of geothermal water will require appropriation.

If the geothermal well yields water that is used as a "mineral source, an energy source, or as a material medium", an appropriation of public waters is not required. Geothermal resources which can be developed as an energy source, a mineral source or as a material medium, are usually dependent on high temperature geothermal reservoirs. Temperatures hot enough for electrical power generation (above 150°C) can be found beneath Western Snake River Plain at depths of 3-4 kilometers. Fluids at these depths are sui generis and would be high temperature, high pressure and often highly mineralized. Fluids at these depths are not normally associated with the developed groundwater. In addition, high temperature fluids may be encountered at shallower depths, if suitable convective reservoir systems are present. Shallow, high temperature fluids are known to exist in several locations in southern Idaho, particularly in the Raft River Basin. These high temperature geothermal fluids are directly related to developed regional groundwaters.

High temperature geothermal fluids, developed as an energy source, a mineral source, or as a material medium are exempt from applications to appropriate water if they will not affect any source of developed underground water. A geothermal resource permit will not be issued if the operation of any well, under the proposed permit, will unreasonably decrease the groundwater available for prior water rights. The burden of proving the interdependence between geothermal sources and prior groundwater rights is with the State of Idaho. The geothermal resource permit will be denied until a valid water appropriation permit has also been obtained.

The statutory intent is to tightly regulate geothermal development which could interfere with a prior appropriation of water. The potential for such a conflict is quite high when considering shallow geothermal sources. Sources of geothermal fluids from depths deeper than two kilometers are generally high temperature sources and could be considered undeveloped and thus unappropriated waters. There would be little difficulty in obtaining an appropriation permit for such deep thermal waters on the grounds of the constitutional guarantee of the State of Idaho, that the appropriation of the unappropriated waters of the state shall not be denied.

In the State of Idaho, any state, private, or federal geothermal operator must obtain a valid geothermal resource permit from Idaho Department of Water Resources before any

drilling operations can begin. The prudent geothermal developer in the State of Idaho would be wise to obtain a permit to appropriate deep, high temperature, fluids used as an energy source. This would guarantee him a prior appropriation of the newly developed water source. The acquisition of a valid water right for a geothermal development appears to be the current interpretation for the administration of this act.

Certainly specific types of geothermal resource utilization are specifically excluded from geothermal resource per requirements.

"No person operating or proposing to operate a geothermally heated greenhouse, hothouse, swimming pool, hot springs bath, or hot water fish propagation facility, space heating plant or similar facility unless such operation is in conjunction with a geothermal resource use not specified in this subdivision, shall be compelled to comply with the geothermal resource permit requirements under this act if such person obtains a valid water right permit for such operation."

The operations mentioned above are low temperature uses of geothermal resources. Low temperature thermal water (80°C-140°C) with potential for space heating and other low temperature uses are common shallow ground water resources in southern Idaho. Under this part of the Idaho Geothermal Resources Act, any irrigation well which contains thermal water and a valid water right could develop a geothermal heating project without a geothermal resource permit.

Presumably, drilling and development of low temperature thermal wells for any of the above geothermal operations will be regulated by the groundwater appropriation laws and water well drilling regulations of the State of Idaho.

If the operation of a low temperature utilization method is in conjunction with a geothermal resource use not specified under this part of the state act, then the operation is regulated by the geothermal resource permit regulations. Secondary developments, associated with higher temperature developments would be governed by the permit regulations of the Geothermal Resource Act. Thus, any high temperature geothermal resource developed for an energy source which also develops a secondary use beyond the primary energy use, would fall under the appropriation clause of the act.

The implication of the exemptive clauses of the Idaho Geothermal Resource Act is that low temperature geothermal utilization only requires a valid water right permit and such operations would be regulated by the appropriation laws of the state. Higher temperature utilization for an energy source or mineral resource requires a geothermal resource permit, but does not require a water right permit. This latter point is

only valid if the well will not interfere with other groundwater users. Conjunctive developments of high and low temperature uses from the same geothermal resource well would require both a water right permit and a geothermal resource permit.

Although many low temperature uses do not require a valid geothermal permit, such operations can acquire one. Likewise high temperature geothermal operations developed as an energy source, a mineral resource or a material medium do not require a valid water right permit, but such operations can acquire such a permit. A prudent operator would be wise in obtaining both permits for additional protection from third party interference and for avoiding potential conflicts with state agencies. A problem with applying for both permits is that performance bonds and application fees are required for each.

3.3 Appropriation Doctrine

Under the general concept of the appropriation doctrine, the individual water user has a guaranteed right to the continued use of water based on the date of his first use of the water. The measure of his certainty to an adequate water supply is his priority date. The appropriation doctrine is the basis of water law in the western United States. In the State of Idaho, the appropriation doctrine included the administration of groundwater resources.

Idaho has had a comprehensive Groundwater Act since 1951. Under this act "the right to groundwater may be acquired only by appropriations." There is no distinction in the Groundwater Act between categories of groundwater. Under this statutory framework, a water right is acquired by diverting the water and applying it to a beneficial use.

The acquisition of groundwater rights in the State of Idaho is through a permit system supervised by the Idaho Department of Water Resources. Under the permit system, any person intending to appropriate water must apply for a permit prior to commencing work on the diversion and distribution facility. The Department then publishes notice and if anyone files a protest against approval of the application, a hearing must be held. The state can deny a permit or grant one for a lesser quantity of water only under the following conditions.

- 1) if the proposed use is such that it will reduce the quantity of water under existing rights.
- 2) if the water supply itself is insufficient for the purpose for which it is sought to be appropriated.
- 3) if it appears to the satisfaction of the Department that such application is not in good faith.
- 4) if the applicant has not sufficient financial resources with which to complete the work involved.

After the diversion has been completed and the water put to a beneficial use, a license is granted. The priority of the water right begins on the date the application for an appropriation permit was filed.

The point here is the difference between developed water and appropriated water. Water that is used in the construction of a geothermal well or water that is injected to develop a geothermal system would have to be derived from another source. This would require an appropriation for that purpose. Thus, a permit to construct a geothermal well of this nature would be dependent upon both a water appropriation permit and a geothermal resource permit. If the particular system involves the extraction of high temperature water for the purpose of mineral or energy extraction, that water will be considered non-tributary water or developed water, providing that such would not be available for use, except through the exertion of development of the geothermal resource. The developer of the water would create a water source and under the appropriation doctrine would be given free rein of disposition of this water provided that no other appropriator could be injured by this action. The geothermal permit does not guarantee the operator a water right to the created water. If the operator wishes assurance against subsequent developers, he would be wise to acquire an appropriation license as prima facie evidence of a water right. The geothermal resource permit gives the operator the right to construct a geothermal well and extract the energy or minerals found therein. Anyone diverting water and applying it to a beneficial use without a permit acquires no rights to the water under the mandatory permit system of water appropriation in the State of Idaho.

The Idaho Groundwater Act seeks to promote "full economic development" of the state's groundwater resources. The full economic development of groundwater is consistent with the constitutional policy of promoting optimum development of the state's water resources. The implications of the phrase "full economic development" to geothermal development is not clear and needs definition.

The Idaho Groundwater Act requires "the maintenance of reasonable groundwater pumping levels." The maintenance of reasonable pumping levels is of concern to geothermal development. The Director of Water Resources can establish groundwater pumping levels in areas "having a common groundwater supply." The interpretation of the phrase "common groundwater supply" is not clearly understood and subject to judicial review. Deep thermal aquifers could not be termed a "common groundwater supply," but they may be hydrologically inter-related to shallower common groundwater supplies. Excessive withdrawal of thermal waters from these deep sources could be restricted if pumping levels of other prior appropriators were affected. Thermal aquifers which are shared by geothermal

developments and other water users, such as irrigation, would fall under the broad term "common groundwater supply." This is particularly true in the Bruneau-Grandview area of northern Owyhee County where irrigation wells yield thermal waters. In all such cases, it would be prudent for the geothermal well operator to have a water right to protect himself against third party interference.

3.4 Attorney General Opinion

In April, 1979, the Attorney General's Office issued Opinion 79-11 as per request of the Honorable Reed Budge, President ProTem, Idaho State Senate. An Attorney General's opinion was requested to clarify Idaho's geothermal statutes. The basic conclusions of this opinion are:

- 1) The State of Idaho claims ownership of geothermal resources whenever mineral rights are reserved by the State;
- 2) Idaho law declares that all groundwaters are owned by the State subject to appropriation under the doctrine "first in time, first in right," as governed by Title 42, Idaho Code. The law distinguishes between groundwater and energy extracted from geothermal sources which "will not unreasonably decrease groundwaters available for prior water rights..."
- 3) The State claims ownership of mineral rights and geothermal resources only in lands presently or previously owned by the State. The Geothermal Resources Act empowers the State to regulate and require permits for geothermal development upon all lands within the State.

3.5. Geothermal Resource Permits.

The purpose of the Geothermal Resources Act, passed by the Idaho Legislature in 1972, is to develop the State's geothermal energy potential "for the enhancement of our economy and quality of life with a minimum of environmental degradation." The rules and regulations adopted under this act establish minimum construction standards for wells and regulates exploration through a permit system. An approved permit from the Department of Water Resources is required before work can begin on geothermal wells. Since 1974 15 geothermal drilling permits have been issued by the Idaho Department of Water Resources. Table 3.5 lists the permit numbers, the applicants name and the location of the proposed well.

TABLE 3.5

GEOHERMAL WELL PERMITS

<u>Permit Number</u>	<u>Applicant</u>	<u>Well Name</u>	<u>Location</u>
13-GR-1	SUNOCO	CH. STOCKS No. 1	NESW S6 T15S R39E
13-GR-2	John Warrick	No. 1	NESE S7 T14S R39E
57-GR-1	Phillips Petroleum	Lawrence D No. 1	SENE S24 T5S R1E
61-GR-1	Gulf Oil Corporation	Bostic 1-A	SWSW S25 T4S R8E
61-GR-2	Gulf Oil Corporation	Bostic 1-A	SWSW S25 T4S R8E
67-GR-1	Phillips Petroleum	Weiser Strat No. 1	SENE S32 T11N R3W
67-GR-2	Phillips Petroleum	Weiser Strat No. 2	NENE S15 T11N R6W
67-GR-3	Phillips Petroleum	Weiser Strat No. 3	SENE S2 T11N R6W
67-GR-4	Echo Dell, Inc.		SENE S12 T11N R3W
67-GR-5	Phillips Petroleum	Chrestensen A No. 1	NWNW S29 T11N R3W
61-GR-3	Union Oil Company	Bostic 1-A	SWSW S25 T4S R8E
63-GR-1	Idaho State Dept. of Administration		SWNE S13 T3N R2E
27-GR-1	White Water Development Company	Dropped	SWNW S25 T5S R36E
21-GR-1	Occidental Geothermal, Inc.	Strum No. 1	NENE S23 T9N R42E
21-GR-2	Occidental Geothermal, Inc.	Egbert Farms No. 1	SWNW S19 T9N R43E

3.6 State Leasing Analysis

Figure 3.6 is a flow diagram of geothermal development on state lands. Specific time factors regarding each step in the flow chart are currently being studied. Table 3.6 details the major institutional requirements which have been plotted in Figure 3.6. Time factors are included when known.

TABLE 3.6
Geothermal Development on State of Idaho Lands

LEASING:

- 1.1 Department of Lands, upon approval of the State Board of Land Commissioners, opens state lands for geothermal leasing. Department of Lands gives public notice of open and simultaneous filing for geothermal leases.
- 1.2 Noncompetitive Lease Applications Open Filing are processed on a first-come first-served basis. Filing date is the day the lease application is received by the Department. Fee is \$25.
- 1.3 Simultaneous Filing occurs in all cases where lands become available for leasing because they are newly acquired, or because an existing lease is cancelled, relinquished, surrendered or terminated. Lease Applications so classified are awarded to qualified applicants by public drawing. Fee is \$25.
- 1.4 Department of Lands consults with the Department of Water Resources prior to designating State lands as being within a KGRA. Actual production in the vicinity of State lands shall be the primary evidence of a KGRA. (has not happened)
 - 1.41 Department of Lands may hold a public hearing before determining the state lands are within a KGRA. This is optional and at the discretion of the Director.
 - 1.42 The Director of the Department of Lands declares State lands to be within a KGRA and post a notice of a public auction. (has not happened)
 - 1.43 Geothermal resources leases issued upon lands so designated (KGRA) shall be upon competitive bid basis and are sold at a public auction. (has not happened)
- 1.5 Lease is approved by the Department of Lands and the State Board of Land Commissioners and sent to the lessee for his signature. (Currently requires 4 to 6 months)

TABLE 3.6 - Continued

- 1.6 Lessee signs lease and returns it to the Department of Lands which signs the lease. Lessee shall furnish a \$2,000 bond. In lieu of the aforementioned bond, lessee may furnish a statewide bond of \$50,000 to cover all lessee's leases and operations. (currently requires 1 to 2 months)

EXPLORATION:

- 2.0 Lessee conducts casual exploration. Each lease includes provisions for diligent exploration. Diligent exploration means exploration operations on or related to the leased lands, including without limitation geochemical surveys, heat flow measurements, core drilling, or drilling of a test well.
- 2.1 Before entering upon leased lands for exploration operations and engaging in operations which may lead to appreciable disturbance or damage to the land surface, the lessee must file with the Director of Department of Lands a written notice of the scope of the operation.
- 2.2 Lessee must comply with all rules and regulations of the Department of Water Resources regarding water rights, geothermal resources and geotechnical data gathering. Notice of operation and permits are required.
- 2.3 Prior to initiation of operations to drill a well for any purpose to one thousand (1,000) feet or deeper, lessee shall submit to the Department of Lands for approval of a plan of operations.
 - 2.31 Geothermal exploration wells must be approved by the Department of Water Resources. A geothermal resource permit can be obtained for exploration and production wells. (currently take 2 to 4 weeks)
 - 2.32 Department of Water Resources reviews and approves geothermal resource permit. This process normally takes two to four weeks if there is no major potential for interference with other wells in the area.
- 2.4 Department of Lands reviews the plan operation and can require changes prior to approval. \$10,000 bond is required.
- 2.5 Exploration Drilling can begin after all necessary permits have been obtained from the Department of Lands and the Department of Water Resources. All leases shall be subject to the condition that the lessee will, in conducting his exploration, use all reasonable precaution to prevent waste of geothermal resources and other natural resources found or developed in the leased lands.

The primary term of a state geothermal lease is ten(10) years. If, at the expiration of the primary term, geothermal resources are not being produced or demonstrably capable of

TABLE 3.6 - Continued

being produced, the lease expires. The lessee is under no obligation to prove his lease until the end of the primary term. Normal exploration process, if pursued with diligence, should not take more than two years from the initial casual exploration through exploration drilling.

DEVELOPMENT:

- 2.6 Discovery of geothermal reservoir and well test.
- 3.0 Decisions to develop the well field is based upon the corporate goals and the geophysical evidence.
- 3.1 Upon the approval of the Department of Lands the plan of operations can be amended to reflect changes in operation on the leased lands, including the installation of works, buildings, plants or structures for the purpose of production. A bond of \$10,000 may be required for each well or a bond of \$50,000 for all statewide operations can be posted.
- 3.2 The lessee submits applications to the Department of Water Resources for permits to drill production wells, and injection wells.
- 3.3 The lessee applies for water rights for anticipated production rates from all wells and for all other waters needed for the operation of the cooling tower and plant. (currently requires 2 months up to 1.5 years)
 - 3.21 The Department of Water Resources approves Injection Permits after receiving approval from the Department of Health and Welfare. (currently requires 1 to 2 months)
 - 3.22 The Department of Water Resources approves all production well drilling permits and requires bonds and construction standards for casing and blow-out prevention. (currently requires 1 to 2 months)
- 3.4 Lessee begins development drilling operation.
 - 3.41 Injection wells are drilled after the production wells prove adequate flow rates.
- 3.5 Well tests are conducted over extended periods of time after injection wells are completed. (not always necessary)
- 3.6 Adequate production indicates that the field is capable of supplying an end use facility.

TABLE 3.6 - Continued

- 4.0 The developing entity conducts a feasibility review of the end use facility based on the production capabilities of the well field.
- 4.1 Preliminary systems design work is completed based on known flow rates and fluid temperature from the well field.
- 4.2 Final negotiations of financial agreements are made between all operating entities.
- 4.3 Based on preliminary design and feasibility studies, a decision to proceed with construction of end use facility is made and application is made for all necessary construction permits.
- 4.4 Developer files for a Certificate of Convenience and Necessity with Idaho Public Utilities Commission. Approval by the PUC may be required earlier in the development process if a public utility has financial involvement in developing the well field.
- 4.5 Based on the decision to construct the end use facility, full well field development can proceed.
- 4.6 Public Utilities Commission approval is required if a public utility is involved in well field development and end use facility construction.
- 4.7 Final Design of end use facility is conducted after receiving PUC approval for construction.
- 4.8 Pipeline construction.
- 4.9 Plant construction.
- 5.0 Power on line.

Geothermal Development Chart for State Of Idaho Lands

BLC - Idaho State Board of Land Commissioners
 DL - Idaho Department of Lands
 DMR - Idaho Department of Water Resources
 DHM - Idaho Department of Health and Welfare
 PUC - Idaho Public Utilities Commission

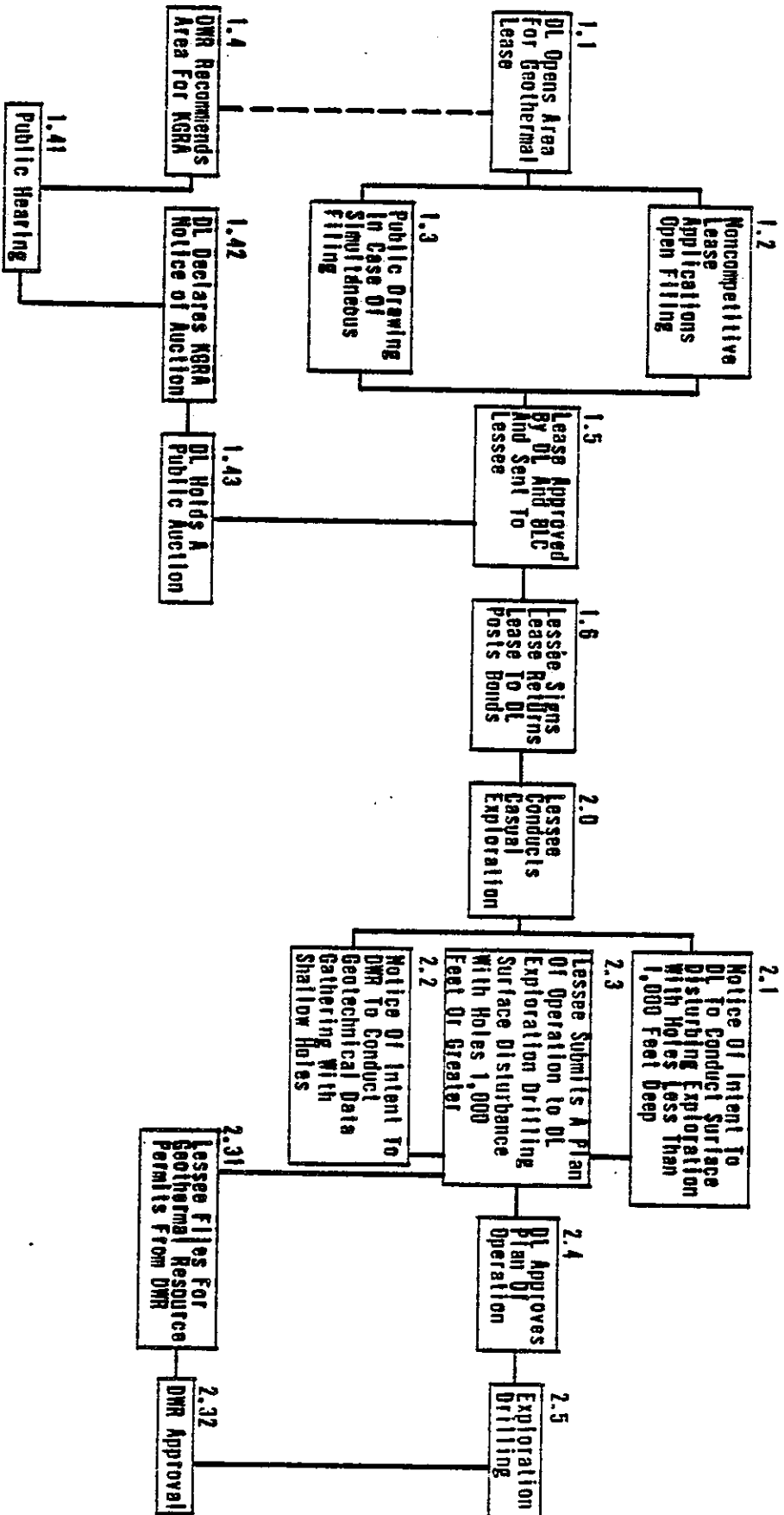


FIGURE 3.6
 IDAHO STATE INSTITUTIONAL ANALYSIS

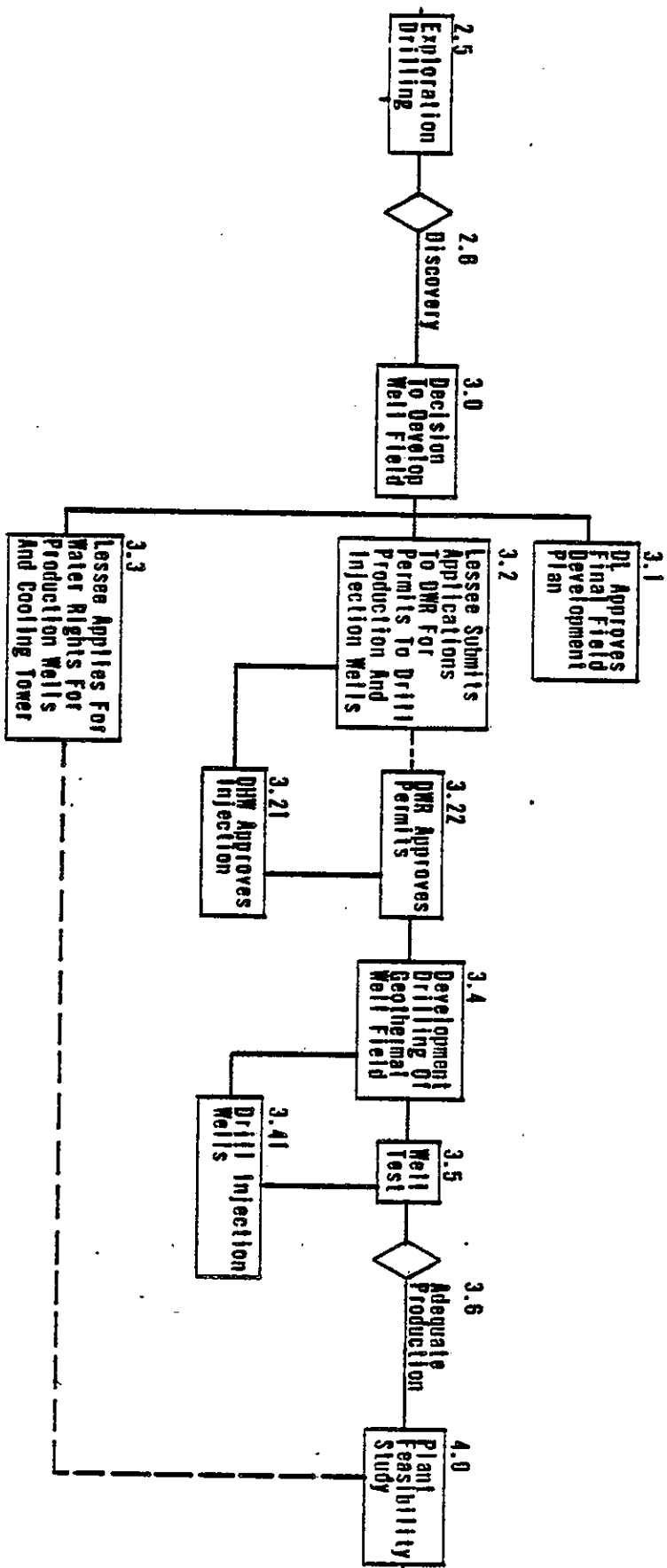


FIGURE 3.6. Continued
 IDAHO STATE INSTITUTIONAL ANALYSIS

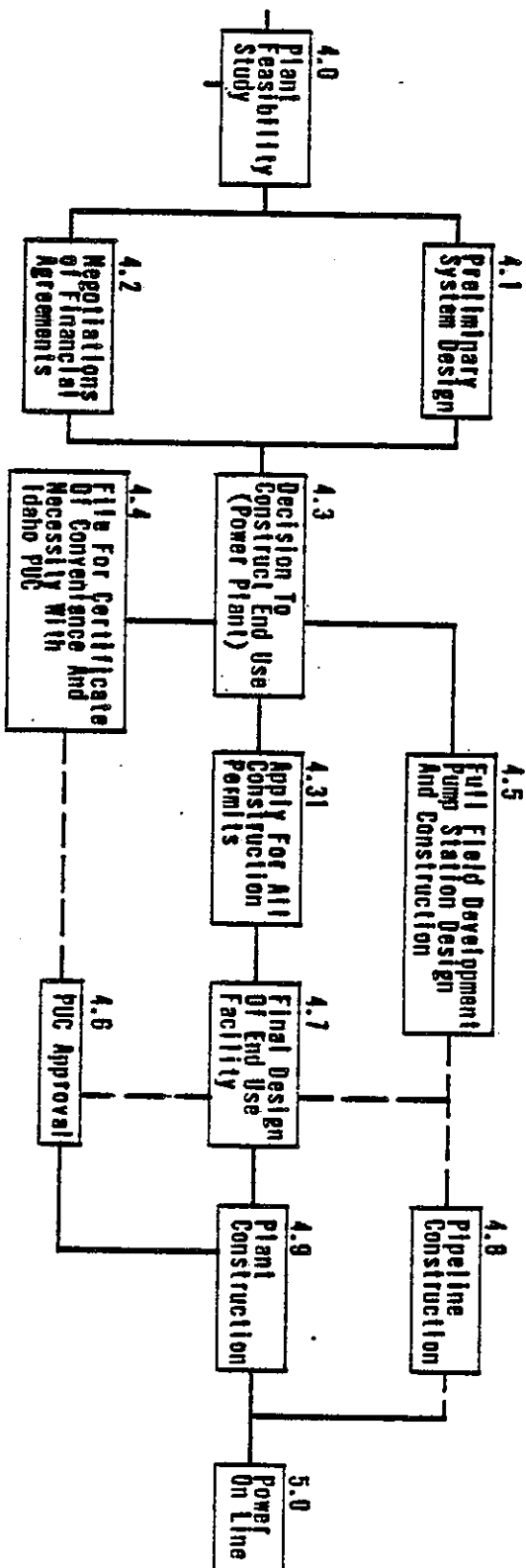


FIGURE 3.6 Continued
 IDAHO STATE INSTITUTIONAL ANALYSIS

3.7 State Leasing Activity

Prior to 1975 the State of Idaho issued geothermal resource exploration leases for 59,504 acres of state owned mineral lands. In 1975, the State Board of Land Commissioners declared a moratorium of the issuance of geothermal leases until adequate rules and regulations could be developed by the State Department of Lands. In 1979, the new rules and regulations were adopted by the Board of Land Commissioners and the moratorium was lifted.

As of November, 1979 the state has issued geothermal resource leases for 335,381 acres of state owned mineral lands. Table 3.7.1 lists the location of active state geothermal leases by lessee. Table 3.7.2 lists the total acres held by individual lease holders.

The data in Tables 3.7.1 and 4.6 is plotted on the state map at a scale of 1:1,000,000 (See appendix) with a resolution of one section. The information displayed on this map shows the relationship between present energy consumption in Idaho and geothermal leasing activity on state and federal lands.

TABLE 3.7.1

IDAHO STATE LEASES BY LESSEE

AMAX EXPLORATION, INC.
4794 Harlan St.
Denver, CO 80212

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
3915-36-78	6S 3E	36	640	Owyhee
3917-16-78	6S 2E	16	640	Owyhee
-36-78	6S 2E	36	640	Owyhee
3919-16-78	6S 1E	16	640	Owyhee
-36-78	6S 1E	36	640	Owyhee
3947-16-78	7S 2E	16	640	Owyhee
3949-16-78	7S 3E	16	640	Owyhee
-16-78	7S 3E	16	640	Owyhee
-36-78	7S 3E	36	640	Owyhee
4117-16-78	8S 6E	16	640	Owyhee
4119-16-78	8S 5E	16	640	Owyhee
-36-78	8S 5E	36	640	Owyhee
4121-16-78	8W 4E	16	640	Owyhee
-36-78	8S 4E	36	640	Owyhee

ANADARKO PRODUCTION CO.
Box 1330
Houston, TX 77001

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
3609-22-79	3S 41E	22	320	Bingham
-24-79		24	400	Bingham
-25-79		25	640	Bingham
-26-79		26	400	Bingham
-27-79		27	430	Bingham
-34-79		34	640	Bingham
-35-79		35	200	Bingham
-36-79		36	640	Bingham
3611-21-79	3S 42E	21	400	Bonneville
-22-79		22	640	Bonneville
-23-79		23	640	Bonneville
-24-79		24	611	Bonneville
-25-79		25	623	Bonneville
-26-79		26	640	Bonneville
-27-79		27	640	Bonneville
-28-79		28	160	Bonneville
-33-79		33	280	Bonneville
-34-79		34	480	Bonneville
-35-79		35	640	Bonneville
-36-79		36	635	Bonneville
3631-03-79	4S 41E	3	543	Bingham
-10-79		10	640	Bingham
-11-79		11	440	Bingham
-12-79		12	240	Bingham
-14-79		14	640	Bingham

TABLE 3.7.1 - Continued

KENNETH M. BRITT
 Box 810
 Jackson, MS 39205

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
2983-03-79	4N 40E	3	560	Madison
-11-79		11	360	Madison
-12-79		12	440	Madison
2985-18-79	4N 41E	16	640	Madison
-17-79		17	640	Madison
-18-79		18	521	Madison
-19-79		19	642	Madison
-20-79		20	480	Madison
-21-79		21	640	Madison
4699-36-78	14S 27E	36	640	Cassia
4825-36-78	15S 25E	36	640	Cassia
4829-16-78	15S 27E	16	640	Cassia
-36-78		36	640	Cassia
4909-16-78	16S 26E	16	640	Cassia
4911-16-78	16S 25E	16	640	Cassia
-24-78		24	520	Cassia
-25-78		25	440	Cassia
-26-78		26	640	Cassia
-35-78		35	560	Cassia
-36-78		36	640	Cassia
2043-36-78	13N 2W	36	560	Washington
2047-36-78	13N 4W	36	640	Washington
2057-36-78	12N 6W	36	640	Washington
2061-16-78	12N 4W	16	520	Washington
3317-36-78	1S 2W	36	627	Owyhee
3505-16-78	2S 1W	16	640	Elmore
-36-78		36	642	Owyhee
3507-16-78	2S 2W	16	640	Owyhee
3507-36-78		36	640	Owyhee
3527-16-78	3S 1W	16	640	Owyhee
-36-78	3S 1W	16	640	Owyhee
3707-04-78	4S 3E	9	640	Owyhee
-10		10	640	Owyhee
-11		11	640	Owyhee
3735-36-78	5S 1W	36	640	Owyhee
3743-36-78	5S 4E	36	640	Owyhee
3947-36-78	7S 2E	36	640	Owyhee
3957-16-78	7S 7E	16	640	Owyhee
4117-36-78	8S 6E	36	640	Owyhee

REUBEN BULLOCK
 Box 370
 Cody, WYO 42414

<u>Lease No.</u>	<u>Location</u>	<u>Section</u>	<u>Acres</u>	<u>County</u>
H-446	10N 13E	16	360	Custer
H-447		36	640	Custer
H-448	11N 13E	36	578	Custer
H-472	12 N 42E	16	640	Fremont

TABLE 3.7.1 - Continued

CHEVRON U.S.A., INC.
 Box 599
 Denver, CO 80201

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
H-421	3N 40E	1	330	Bonneville
H-422	3N 40E	2	40	Bonneville
H-423	3N 40E	13	240	Bonneville
H-424	3N 40E	14	280	Bonneville
H-425	3N 40E	16	440	Bonneville
H-426	4N 40E	22	38	Madison & Jefferson
H-427	4N 40E	23	92	Madison & Jefferson
H-428	4N 40E	25	92	Madison & Jefferson
H-429	4N 40E	26	184	Madison & Jefferson
H-430	4N 40E	36	198	Madison & Jefferson
H-431	3N 41E	5	94	Bonneville
H-432	3N 41E	6	139	Bonneville
H-433	3N 41E	8	54	Bonneville
H-434	3N 41E	9	22	Bonneville
H-435	3N 41E	16	640	Bonneville
H-436	3N 41E	17	160	Bonneville
H-437	4N 41E	31	56	Madison
H-438	4N 41E	32	6	Madison
H-430	14S 39E	36	40	Franklin
H-440	15S 39E	1	160	Franklin
3626-16-79	4S 42E	16	240	Bonneville
3631-13-79	4S 41E	13	640	Bingham
-24-79	4S 41E	24	641	Bingham
-25-79	4S 41E	25	600	Bingham
-36-79	4S 41E	36	640	Bingham
3817-01-79	5S 41E	1	642	Caribou
3819-06-79	5S 42E	6	644	Caribou
3877-21-79	6S 42E	21	640	Caribou
-28-79	6S 42E	28	640	Caribou
-29-79	6S 42E	29	360	Caribou
-32-79	6S 42E	32	240	Caribou
4025-08-79	7S 41E	8	640	Caribou
4027-20-79	7S 42E	20	640	Caribou

RICHARD C. HOEFLE
 Box 611
 Billings, Montana 59103

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
3835-16-79	6S 43E	16	640	Caribou
-20-79	6S 43E	20	640	Caribou
-21-79	6S 43E	21	640	Caribou
-29-79	6S 43E	29	640	Caribou
-32-79	6S 43E	32	640	Caribou
-36-79	6S 43E	36	640	Caribou
4029-16-79	7S 43E	16	640	Caribou
-17-79	7S 43E	17	640	Caribou
-21-79	7S 43E	21	640	Caribou
-28-79	7S 43E	28	640	Caribou
-36-79	7S 43E	36	640	Caribou

TABLE 3.7.1 - Continued

F. JOE KANTA
Rt. 3
Caldwell, ID 83605

<u>Lease No.</u>	<u>Location</u>	<u>Section</u>	<u>Acres</u>	<u>County</u>
H-479	3N 2E	13	300	Ada
H-482	3N 3E	18	411	Ada
H-718	3N 2E	12	40	Ada
H-720	3N 3E	6	411	Ada
H-721	3N 3E	17	400	Ada

MAGMA ENERGY, INC.

<u>Lease No.</u>	<u>Location</u>	<u>Section</u>	<u>Acres</u>	<u>County</u>
H-608	3S 8E	16	600	Elmore
-609		22	40	Elmore
-611		36	320	Elmore
-612	4S 8E	3	320	Elmore
-613		4	640	Elmore
-614		9	640	Elmore
-616		11	600	Elmore
-617		14	320	Elmore
-618		15	320	Elmore
-619		16	640	Elmore
-620		21	640	Elmore
-621		22	160	Elmore
-622		23	160	Elmore
-623		24	160	Elmore
-624		28	640	Elmore
-625		33	640	Elmore
-626		36	640	Elmore
H-637	4S 9E	16	520	Elmore
3547-36-79 (a)	3S 10E	36	640	Elmore
3693-16-79 (a)	4S 10E	16	640	Elmore
-36 (a)		36	640	Elmore
3695-36-79 (a)		36	640	Elmore
3697-10-78 (a)		10	640	Elmore
3699-36-79 (a)		36	640	Elmore
3753-16-79 (a)		16	640	Elmore
3755-12-79 (a)		12	55	Elmore
-13-79 (a)		13	24	Elmore
-14-79 (a)	5S 10E	14	102	Elmore
-16-79 (a)		16	640	Elmore

(a) 50% Union Oil

TABLE 3.7.1 - Continued

OCCIDENTAL GEOTHERMAL, INC.
5000 Stockdale Hwy
Bakersfield, CA 93339

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
H-151	11N 41E	16	640	Fremont
H-153	11N 42E	16	640	Fremont
H-156	12N 42E	36	323	Fremont
H-157	13N 42E	16	440	Fremont
H-158	13N 42E	36	640	Fremont
H-160	12N 43E	36	640	Fremont
H-161	13N 43E	16	640	Fremont
H-163	13N 44E	4	80	Fremont
H-164	13N 44E	9	160	Fremont
H-165	13N 44E	10	320	Fremont
H-166	13N 44E	16	640	Fremont
H-167	13N 44E	19	262	Fremont
H-168	13N 44E	30	320	Fremont
H-169	13N 44E	36	640	Fremont
H-762	11N 41E	36	640	Fremont
H-764	11N 42E	36	640	Fremont
H-767	10N 43E	16	640	Fremont
H-768	10N 43E	36	640	Fremont
H-769	11N 43E	16	640	Fremont
H-770	11N 43E	36	648	Fremont
H-771	12N 43E	16	640	Fremont
H-773	13N 43E	36	640	Fremont
H-774	10N 44E	16	640	Fremont
H-208	4S 1W	36	560	Owyhee
H-209	5S 1W	16	640	Owyhee
H-235	3S 1E	36	414	Owyhee
H-236	4S 1E	1	520	Owyhee
H-237	4S 1E	2	241	Owyhee
H-238	4S 1E	11	320	Owyhee
H-239	4S 1E	12	640	Owyhee
H-240	4S 1E	13	320	Owyhee
H-241	4S 1E	14	160	Owyhee
H-242	4S 1E	16	640	Owyhee
H-243	4S 1E	22	320	Owyhee
H-244	4S 1E	23	440	Owyhee
H-245	4S 1E	24	160	Owyhee
H-246	4S 1E	26	80	Owyhee
H-247	4S 1E	27	320	Owyhee
H-248	4S 1E	36	640	Owyhee
H-249	5S 1E	16	440	Owyhee
H-250	5S 1E	21	200	Owyhee
H-251	5S 1E	36	640	Owyhee
H-254	4S 2E	15	84	Owyhee
H-255	4S 2E	16	640	Owyhee
H-256	4S 2E	21	40	Owyhee
H-280	5S 3E	13	232	Owyhee
H-281	5S 3E	14	243	Owyhee
H-282	5S 3E	16	347	Owyhee
H-283	5S 3E	17	240	Owyhee
H-284	5S 3E	18	280	Owyhee

TABLE 3.7.1 - Continued

OCCIDENTAL GEOTHERMAL, INC. (Continued)

<u>Lease No.</u>	<u>Location</u>	<u>Section</u>	<u>Acres</u>	<u>County</u>
H-285	5S 3E	23	132	Owyhee
H-286	5S 3E	25	40	Owyhee
H-287	5S 3E	26	160	Owyhee
H-288	5S 3E	35	400	Owyhee
H-289	5S 3E	36	560	Owyhee
H-290	6S 3E	11	120	Owyhee
H-291	6S 3E	14	160	Owyhee
H-301	6S 4E	16	640	Owyhee
H-302	6S 4E	36	640	Owyhee
H-303	7S 4E	16	640	Owyhee
H-304	7S 4E	36	640	Owyhee
H-307	6S 5E	16	160	Owyhee
H-308	6S 5E	23	120	Owyhee
H-309	6S 5E	24	160	Owyhee
H-310	6S 5E	35	520	Owyhee
H-311	7S 5E	16	640	Owyhee
H-319	7S 6E	16	160	Owyhee
H-320	7S 6E	27	120	Owyhee
H-321	7S 6E	36	640	Owyhee

TABLE 3.7.1 - Continued

PHILLIPS PETROLEUM CO.
 Box 239
 Salt Lake City, Utah 84110

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
2189-16-79	11N 33E	16	640	Clark
2189-36-79	11N 33E	36	640	Clark
2191-36-79	11N 32E	36	602	Clark
2347-36-79	10N 32E	36	640	Clark
2349-16-79	10N 33E	16	640	Clark
2351-16-79	10N 34E	16	640	Clark
2401-16-79	9N 34E	16	640	Clark
2403-36-79	9N 33E	36	640	Clark
2983-01-79	4N 40E	1	280	Madison
-02-79	4N 40E	2	320	Madison
-10-79	4N 40E	10	280	Madison
2985-01-79	4N 41E	1	641	Madison
-02-79	4N 41E	2	642	Madison
-09-79	4N 41E	9	400	Madison
-10-79	4N 41E	10	400	Madison
-11-79	4N 41E	11	640	Madison
-12-79	4N 41E	12	640	Madison
-13-79	4N 41E	13	640	Madison
-14-79	4N 41E	14	640	Madison
-15-79	4N 41E	15	640	Madison
-22-79	4N 41E	22	640	Madison
-23-79	4N 41E	23	640	Madison
-24-79	4N 41E	24	640	Madison
3007-19-79	3N 41E	19	244	Bonneville
-30-79	3N 41E	30	324	Bonneville
-31-79	3N 41E	31	604	Bonneville
-32-79	3N 41E	32	240	Bonneville
3007-36-79	3N 41E	36	320	Bonneville
3009-20-79	3N 40E	20	640	Bonneville
-21-79	3N 40E	21	560	Bonneville
-24-79	3N 40E	24	320	Bonneville
-25-79	3N 40E	25	520	Bonneville
-29-79	3N 40E	29	400	Bonneville
-32-79	3N 40E	32	80	Bonneville
-33-79	3N 40E	33	440	Bonneville
-35-79	3N 40E	35	280	Bonneville
-36-79	3N 40E	36	280	Bonneville
3609-01-79	3S 41E	1	345	Bingham
-02-79	3S 41E	2	689	Bingham
-03-79	3S 41E	3	369	Bingham
-04-79	3S 41E	4	277	Bingham
-05-79	3S 41E	5	265	Bingham
-06-79	3S 41E	6	210	Bingham
-07-79	3S 41E	7	157	Bingham
-08-79	3S 41E	8	160	Bingham
-09-79	3S 41E	9	40	Bingham
-10-79	3S 41E	10	80	Bingham
-11-79	3S 41E	11	80	Bingham
-12-79	3S 41E	12	240	Bingham
-13-79	3S 41E	13	640	Bingham
-14-79	3S 41E	14	40	Bingham
-15-79	3S 41E	15	160	Bingham
-16-79	3S 41E	16	640	Bingham
-17-79	3S 41E	17	640	Bingham
		32		

TABLE 3.7.1 - Continued

PHILLIPS (cont.)

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
3609-18-79	3S 42E	18	517	Bingham
-19-79	3S 42E	19	40	Bingham
-20-79	3S 42E	20	480	Bingham
-23-79	3S 42E	23	40	Bingham
-28-79	3S 42E	28	640	Bingham
-29-79	3S 42E	29	320	Bingham
-32-79	3S 42E	32	280	Bingham
-33-79	3S 42E	33	640	Bingham
3611-16-79	3S 42E	16	640	Bonneville
3631-01-79	4S 41E	1	71	Bingham
-02-79	4S 41E	2	316	Bingham
-04-79	4S 41E	4	312	Bingham
-05-79	4S 41E	5	80	Bingham
-06-79	4S 41E	6	40	Bingham
-07-79	4S 41E	7	200	Bingham
-08-79	4S 41E	8	280	Bingham
-16-79	4S 41E	16	640	Bingham
-17-79	4S 41E	17	320	Bingham
-18-79	4S 41E	18	401	Bingham
-21-79	4S 41E	21	240	Bingham
-22-79	4S 41E	22	120	Bingham
-23-79	4S 41E	23	320	Bingham
-26-79	4S 41E	26	480	Bingham
3817-02-79	5S 41E	2	642	Caribou
-02-79	5S 41E	3	643	Caribou
-04-79	5S 41E	4	642	Caribou
-12-79	5S 41E	12	640	Caribou
3819-07-79	5S 42E	7	643	Caribou
-08-79	5S 42E	8	640	Caribou
-16-79	5S 42E	16	440	Caribou
-17-79	5S 42E	17	640	Caribou
-18-79	5S 42E	18	642	Caribou
-19-79	5S 42E	19	642	Caribou
-20-79	5S 42E	20	640	Caribou
-36-79	5S 42E	36	640	Caribou
3837-22-79	6S 42E	22	640	Caribou
-23-79	6S 42E	23	640	Caribou
-24-79	6S 42E	24	640	Caribou
-25-79	6S 42E	25	640	Caribou
-26-79	6S 42E	26	640	Caribou
-27-79	6S 42E	27	640	Caribou
-33-79	6S 42E	28	640	Caribou
-35-79	6S 42E	35	640	Caribou
3839-07-79	6S 41E	7	642	Caribou
-09-79	6S 41E	9	640	Caribou
-10-79	6S 41E	10	320	Caribou
-16-79	6S 41E	16	640	Caribou
-19-79	6S 41E	19	642	Caribou
-21-79	6S 41E	21	640	Caribou
-22-79	6S 41E	22	400	Caribou
-29-79	6S 41E	29	640	Caribou
-32-79	6S 41E	32	640	Caribou
4025-06-79	7S 41E	6	423	Caribou
-09-79	7S 41E	9	640	Caribou
4025-16-79	7S 41E	16	640	Caribou

TABLE 3.7.1 - Continued

PHILLIPS (cont.)

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
4025-16-79	7S 41E	18	320	Caribou
4027-17-79	7S 42E	17	640	Caribou
-25-79	7S 42E	25	640	Caribou
-26-79	7S 42E	26	320	Caribou
-32-79	7S 42E	32	640	Caribou
-35-79	7S 42E	35	320	Caribou
-36-79	7S 42E	36	560	Caribou
4851-05-79	15S 38E	5	486	Franklin
-08-79	15S 28E	8	640	Franklin
-16-79	15S 28E	16	600	Franklin
-17-79	15S 28E	17	480	Franklin
H-723	10N 3W	16	600	Washington
-724	10N 3W	17	120	Washington
-725	11N 3W	36	640	Washington
-727	11N 3W	36	640	Washington
-730	11N 4W	36	640	Washington
-731	12N 4W	36	640	Washington

TABLE 3.7.1 - Continued

RAFT RIVER RURAL ELECTRIC COOPERATIVE, INC.
 Box 617
 Malta, ID 83342

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
H-754	14S 26E	36	640	Cassia
H0755	15S 26E	16	640	Cassia

SIMASKO PRODUCTION CO.
 401 Denver Building
 Denver, Colorado 80203

<u>Lease No.</u>	<u>Location</u>	<u>Section</u>	<u>Acres</u>	<u>County</u>
2261-16-78	11N 3W	16	640	Washington
3269-36-78	1N 14E	36	320	Camas
3273-36-78	1N 12E	36	200	Camas
3343-16-78	1S 12E	16	320	Camas
3345-36-78	1S 13E	36	640	Camas
3347-16-78	1S 14E	36	560	Camas
3707-36-78	4S 3E	36	640	Elmore
3907-16-78	6S 7E	16	640	Owyhee
3915-16-78	6S 3E	16	640	Owyhee
3953-36-78	7S 5E	36	640	Owyhee

SOUTHLAND ROYALTY CO.
 1000 Fort Worth Club Tower
 Fort Worth, Texas 76102

<u>Lease No.</u>	<u>Location</u>	<u>Section</u>	<u>Acres</u>	<u>County</u>
4467-13-79	12S 39E	13	640	Franklin
3275-36-78	1N 11E	36	631	Elmore
3545-19-79	3S 9E	19	37	Elmore
3707-08-78	4S 3E	8	640	Elmore
3957-36-78	7S 7W	36	640	Owyhee

TABLE 3.7.1 - Continued

LAURA J. SPANGLER
 2827 Venus Place
 Boise, Idaho 83704

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
2383-16-79	9N 43E	16	400	Fremont
-25-79	9N 43E	25	120	Fremont
-26-79	9N 43E	26	40	Fremont
-36-79	9N 43E	36	80	Fremont

SUNOCO ENERGY DEVELOPMENT CO.
 12700 Park Central Place, Suite 1500
 Dallas, Texas 75251

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
H-787	13S 26E	36	640	Cassia
H-789	15S 26E	36	640	Cassia
H-790	14S 27E	16	640	Cassia
H-791	16S 27E	16	640	Cassia
H-792	14S 38E	36	240	Cassia

TABLE 3.7.1 - Continued

SUPRON ENERGY CORP.
 10300 North Central Expwy.
 Building V, Fifth Floor
 Dallas, TX 75231

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
2157-16-79	12N 44E	16	160	Fremont
3817-09-79	5S 41E	9	640	Caribou
-10-79	5S 41E	10	640	Caribou
-11-79	5S 41E	11	640	Caribou
-13-79	5S 41E	13	640	Caribou
-14-79	5S 41E	14	640	Caribou
-15-79	5S 41E	15	640	Caribou
-16-79	5S 41E	16	400	Caribou
-22-79	5S 41E	22	440	Caribou
-23-79	5S 41E	23	640	Caribou
-24-79	5S 41E	24	640	Caribou
-25-79	5S 41E	25	640	Caribou
-26-79	5S 41E	26	280	Caribou
-29-79	5S 41E	29	80	Caribou
-31-79	5S 41E	31	40	Caribou
-32-79	5S 41E	32	40	Caribou
-33-79	5S 41E	33	40	Caribou
-36-79	5S 41E	36	440	Caribou
3819-29-79	5S 41E	29	640	Caribou
-30-79	5S 41E	30	642	Caribou
-31-79	5S 41E	31	560	Caribou
-32-79	5S 41E	32	640	Caribou
3837-13-79	6S 42E	13	640	Caribou
-14-79	6S 42E	14	640	Caribou
-16-79	6S 42E	16	240	Caribou
-20-79	6S 42E	20	240	Caribou
-34-79	6S 42E	34	640	Caribou
-36-79	6S 42E	36	630	Caribou
3839-03-79	6S 41E	3	280	Caribou
-04-79	6S 41E	4	641	Caribou
-08-79	6S 41E	8	640	Caribou
-15-79	6S 41E	15	440	Caribou
-17-79	6S 41E	17	640	Caribou
-18-79	6S 41E	18	641	Caribou
-20-79	6S 41E	20	640	Caribou
-28-79	6S 41E	28	640	Caribou
-30-79	6S 41E	30	641	Caribou
-31-79	6S 41E	31	640	Caribou
4025-04-79	7S 41E	4	438	Caribou
-05-79	7S 41E	5	441	Caribou
-07-79	7S 41E	7	614	Caribou
4025-17-79	7S 41E	17	640	Caribou
-19-79	7S 41E	19	612	Caribou
-36-79	7S 41E	36	360	Caribou
4027-01-79	7S 42E	1	419	Caribou
-02-79	7S 42E	2	423	Caribou
-03-79	7S 42E	3	425	Caribou
-10-79	7S 42E	10	560	Caribou
-11-79	7S 42E	11	600	Caribou

TABLE 3.7.1 - Continued

SUPRON ENERGY CORP (cont.)

<u>Lease No.</u>	<u>Location</u>	<u>Sec.</u>	<u>Acres</u>	<u>County</u>
4027-12-79	7S 42E	12	520	Caribou
-29-79	7S 42E	29	640	Caribou
4463-16-79	12S 41E	16	640	Franklin
4465-16-79	12S 40E	16	400	Franklin
-36-79	12S 40E	36	200	Franklin
4647-16-79	13S 40E	16	160	Franklin
-36-79	13S 40E	36	400	Franklin
4649-16-79	13S 41E	16	200	Franklin

TABLE 3.7.1 - Continued

UNION OIL COMPANY OF CALIFORNIA
 461 S. Boylston Street
 Los Angeles, CA 90017

LEASE NO.	LOCATION	SECTION	ACRES	COUNTY
2573-12-79	8N 42E	12	160	Fremont
-15-79	8N 42E	15	160	Fremont
-16-79	8N 42E	16	160	Fremont
-18-79	8N 42E	18	139	Fremont
-26-79	8N 42E	26	160	Fremont
-32-79	8N 42E	32	240	Fremont
-33-79	8N 42E	33	480	Fremont
-34-79	8N 42E	34	480	Fremont
-35-79	8N 42E	35	440	Fremont
2573-36-79	8N 42E	36	240	Fremont
2575-18-79	8N 43E	18	158	Fremont
-31-79	8N 43E	31	80	Fremont
-32-79	8N 43E	32	40	Fremont
2589-07-79	7N 43E	7	322	Fremont
-08-79	7N 43E	8	320	Fremont
-17-79	7N 43E	17	520	Fremont
-18-79	7N 43E	18	482	Fremont
2591-02-79	7N 42E	2	563	Fremont
-03-79	7N 42E	3	644	Fremont
-04-79	7N 42E	4	644	Fremont
-05-79	7N 42E	5	400	Fremont
-06-79	7N 42E	6	624	Fremont
-07-79	7N 42E	7	627	Fremont
-08-79	7N 42E	8	640	Fremont
-09-79	7N 42E	9	640	Fremont
-10-79	7N 42E	10	640	Fremont
-11-79	7N 42E	11	640	Fremont
-12-79	7N 42E	12	240	Fremont
-13-79	7N 42E	13	400	Fremont
-14-79	7N 42E	14	440	Fremont & Madison
-15-79	7N 42E	15	480	Fremont & Madison
-16-79	7N 42E	16	600	Fremont
-17-79	7N 42E	17	640	Fremont
-18-79	7N 42E	18	629	Fremont
-19-79	7N 42E	19	471	Fremont & Madison
-20-79	7N 42E	20	520	Fremont & Madison
-21-79	7N 42E	21	340	Fremont & Madison
-22-79	7N 42E	22	409	Fremont & Madison
-23-79	7N 42E	23	247	Fremont & Madison
-24-79	7N 42E	24	480	Fremont & Madison
-25-79	7N 42E	25	217	Madison
-26-79	7N 42E	26	329	Madison
-27-79	7N 42E	27	640	Madison
-28-79	7N 42E	28	640	Madison
-29-79	7N 42E	29	160	Madison
-30-79	7N 42E	30	197	Fremont & Madison
-31-79	7N 42E	31	280	Fremont & Madison
-32-79	7N 42E	32	640	Fremont & Madison

TABLE 3.7.1 - Continued

Union Oil Company of California (Continued)

LEASE NO.	LOCATION	SECTION	ACRES	COUNTY
2591-33-79	7N 42E	33	280	Madison
-34-79	7N 42E	34	640	Madison
-35-79	7N 42E	35	453	Madison
-36-79	7N 42E	36	333	Madison
2593-01-79	7N 41E	1	320	Fremont
-10-79	7N 41E	10	80	Fremont
2593-11-79	7N 41E	11	360	Fremont
-12-79	7N 41E	12	640	Fremont
-13-79	7N 41E	13	320	Fremont
-24-79	7N 41E	24	440	Fremont
-25-79	7N 41E	25	160	Fremont
2777-01-79	6N 41E	1	80	Madison
-9-79	6N 41E	9	160	Madison
-10-79	6N 41E	10	160	Madison
-11-79	6N 41E	11	480	Madison
-12-79	6N 41E	12	640	Madison
-13-79	6N 41E	13	640	Madison
-14-79	6N 41E	14	640	Madison
-15-79	6N 41E	15	640	Madison
-16-79	6N 41E	16	480	Madison
-21-79	6N 41E	21	40	Madison
-22-79	6N 41E	22	640	Madison
-23-79	6N 41E	23	640	Madison
-24-79	6N 41E	24	640	Madison
-25-79	6N 41E	25	320	Madison
-27-29	6N 41E	27	320	Madison
-34-79	6N 41E	34	240	Madison
-35-79	6N 41E	35	440	Madison
-36-79	6N 41E	36	640	Madison
2779-01-79	6N 42E	1	272	Madison
-02-79	6N 42E	2	641	Madison
-03-79	6N 42E	3	441	Madison
-04-79	6N 42E	4	401	Madison
-05-79	6N 42E	5	200	Madison
-06-79	6N 42E	6	160	Madison
-07-79	6N 42E	7	560	Madison
-08-79	6N 42E	8	640	Madison
-09-79	6N 42E	9	320	Madison
-10-79	6N 42E	10	160	Madison
-11-79	6N 42E	11	320	Madison
-12-79	6N 42E	12	360	Madison
-13-79	6N 42E	13	40	Madison
-14-79	6N 42E	14	40	Madison
-16-79	6N 42E	16	600	Madison
-17-79	6N 42E	17	640	Madison
-18-79	6N 42E	18	639	Madison
-19-79	6N 42E	19	520	Madison
-20-79	6N 42E	20	160	Madison
-21-79	6N 42E	21	160	Madison
-22-79	6N 42E	22	480	Madison

TABLE 3.7.1 - Continued

Union Oil Company of California (Continued)

LEASE NO.	LOCATION	SECTION	ACRES	COUNTY
2779-23-79	6N 42E	23	320	Madison
-24-79	6N 42E	24	440	Madison
-25-79	6N 42E	25	640	Madison
-26-79	6N 42E	26	640	Madison
-27-79	6N 42E	27	640	Madison
-28-79	6N 42E	28	640	Madison
-29-79	6N 42E	29	640	Madison
-30-79	6N 42E	30	640	Madison
-31-79	6N 42E	31	640	Madison
-32-79	6N 42E	32	640	Madison
-33-79	6N 42E	33	640	Madison
-34-79	6N 42E	34	640	Madison
-35-79	6N 42E	35	640	Madison
-36-79	6N 42E	36	640	Madison
2797-01-79	5N 42E	1	462	Madison
-02-79	5N 42E	2	503	Madison
-03-79	5N 42E	3	505	Madison
-04-79	5N 42E	4	508	Madison
-05-79	5N 42E	5	512	Madison
-06-79	5N 42E	6	493	Madison
-07-79	5N 42E	7	620	Madison
-08-79	5N 42E	8	640	Madison
-09-79	5N 42E	9	640	Madison
-10-79	5N 42E	10	640	Madison
-11-79	5N 42E	11	480	Madison
-12-79	5N 42E	12	360	Madison
-13-79	5N 42E	13	600	Madison
-14-79	5N 42E	14	520	Madison
-15-79	5N 42E	15	640	Madison
-16-79	5N-42E	16	640	Madison
-17-79	5N 42E	17	640	Madison
-18-79	5N 42E	18	551	Madison
-19-79	5N 42E	19	615	Madison
-20-79	5N 42E	20	640	Madison
-21-79	5N 42E	21	640	Madison
-22-79	5N 42E	22	640	Madison
-23-79	5N 42E	23	600	Madison
-24-79	5N 42E	24	640	Madison
-26-79	5N 42E	26	600	Madison
-27-79	5N 42E	27	520	Madison
-28-79	5N 42E	28	640	Madison
-29-79	5N 42E	29	640	Madison
-30-79	5N 42E	30	614	Madison
-31-79	5N 42E	31	618	Madison
-32-79	5N 42E	32	640	Madison
-33-79	5N 42E	33	640	Madison
-34-79	5N 42E	34	600	Madison
2799-01-79	5N 41E	1	533	Madison
-02-79	5N 41E	2	375	Madison
-05-79	5N 41E	5	184	Madison
-06-79	5N 41E	6	343	Madison
-07-79	5N 41E	7	638	Madison

TABLE 3.7.1-- Continued

Union Oil Company of California (Continued)

LEASE NO.	LOCATION	SECTION	ACRES	COUNTY
2799-08-79	5N 41E	8	120	Madison
-10-79	5N 41E	10	320	Madison
-11-79	5N 41E	11	640	Madison
-12-79	5N 41E	12	640	Madison
-13-79	5N 41E	13	640	Madison
-14-79	5N 41E	14	640	Madison
-15-79	5N 41E	15	640	Madison
-16-79	5N 41E	16	280	Madison
-17-79	5N 41E	17	160	Madison
-18-79	5N 41E	18	558	Madison
-19-79	5N 41E	19	240	Madison
-21-79	5N 41E	21	560	Madison
-22-79	5N 41E	22	640	Madison
-23-79	5N 41E	23	640	Madison
-24-79	5N 41E	24	640	Madison
-25-79	5N 41E	25	640	Madison
-26-79	5N 41E	26	240	Madison
-27-79	5N 41E	27	640	Madison
-28-79	5N 41E	28	640	Madison
-33-79	5N 41E	33	280	Madison
-34-79	5N 41E	34	640	Madison
-35-79	5N 41E	35	640	Madison
-36-79	5N 41E	36	640	Madison
3219-14-79	1N 39E	14	80	Bonneville
-16-79	1N 39E	16	560	Madison
-24-79	1N 39E	24	40	Madison
-36-79	1N 39E	36	640	Bonneville
3221-36-79	1N 38E	36	640	Bonneville
3397-16-79	1S 39E	16	320	Bingham
3401-16-79	1S 41E	16	640	Bonneville
-25-79	1S 41E	25	640	Bonneville
-34-79	1S 41E	34	320	Bonneville
-35-79	1S 41E	35	640	Bonneville
-36-79	1S 41E	36	640	Bonneville
3421-03-79	2S 42E	3	639	Bonneville
-04-79	2S 42E	4	638	Bonneville
-05-79	2S 42E	5	639	Bonneville
-06-79	2S 42E	6	629	Bonneville
-07-79	2S 42E	7	631	Bonneville
-08-79	2S 42E	8	640	Bonneville
-09-79	2S 42E	9	640	Bonneville
-10-79	2S 42E	10	643	Bonneville
-11-79	2S 42E	11	640	Bonneville
-14-79	2S 42E	14	650	Bonneville
-15-79	2S 42E	15	651	Bonneville
-16-79	2S 42E	16	640	Bonneville
-17-79	2S 42E	17	640	Bonneville
-18-79	2S 42E	18	632	Bonneville
-19-79	2S 42E	19	514	Bonneville
-20-79	2S 42E	20	600	Bonneville

TABLE 3.7.1 - Continued

Union Oil Company of California (Continued)

LEASE NO.	LOCATION	SECTION	ACRES	COUNTY
3421-21-79	2S 42E	21	600	Bonneville
-22-79	2S 42E	22	640	Bonneville
-23-79	2S 42E	23	640	Bonneville
-24-79	2S 42E	24	640	Bonneville
-25-79	2S 42E	25	640	Bonneville
-26-79	2S 42E	26	560	Bonneville
-27-79	2S 42E	27	400	Bonneville
-28-79	2S 42E	28	200	Bonneville
-29-79	2S 42E	29	320	Bonneville
-30-79	2S 42E	30	631	Bonneville
-31-79	2S 42E	31	592	Bonneville
-32-79	2S 42E	32	480	Bonneville
-33-79	2S 42E	33	560	Bonneville
-34-79	2S 42E	34	600	Bonneville
-35-79	2S 42E	35	520	Bonneville
-36-79	2S 42E	36	640	Bonneville
3423-01-79	2S 41E	1	665	Bingham
-02-79	2S 41E	2	346	Bingham
-03-79	2S 41E	3	454	Bingham
-04-79	2S 41E	4	349	Bingham
-05-79	2S 41E	5	48	Bingham
-08-79	2S 41E	8	120	Bingham
-09-79	2S 41E	9	360	Bingham
-11-79	2S 41E	11	640	Bingham
-12-79	2S 41E	12	604	Bingham
-13-79	2S 41E	13	322	Bingham
-15-79	2S 41E	15	120	Bingham
-16-79	2S 41E	16	640	Bingham
-17-79	2S 41E	17	200	Bingham
-19-79	2S 41E	19	440	Bingham
-20-79	2S 41E	20	200	Bingham
-21-79	2S 41E	21	280	Bingham
-22-79	2S 41E	22	160	Bingham
-23-79	2S 41E	23	80	Bingham
-24-79	2S 41E	24	405	Bingham
-25-79	2S 41E	25	80	Bingham
-26-79	2S 41E	26	320	Bingham
-27-79	2S 41E	27	360	Bingham
-28-79	2S 41E	28	320	Bingham
-29-79	2S 41E	29	640	Bingham
-30-79	2S 41E	30	27	Bingham
-32-79	2S 41E	32	120	Bingham
-33-79	2S 41E	33	400	Bingham
-34-79	2S 41E	34	520	Bingham
-35-79	2S 41E	35	120	Bingham
-36-79	2S 41E	36	644	Bingham
4675-16-79	14S 39E	16	640	Franklin
4677-10-79	14S 38E	10	205	Franklin
-15-79	14S 38E	15	120	Franklin

TABLE 3.7.1 - Continued

UNION OIL CO. OF CALIF. (Continued)

<u>LEASE NO.</u>	<u>LOCATION</u>	<u>SECTION</u>	<u>ACRES</u>	<u>COUNTY</u>
2263-14-79	11N 4W	14	80	Washington
-33	11N 4W	33	360	Washington
2277-08-79	10N 3W	8	40	Washington
-29	10N 3W	29	20	Washington
-36	10N 3W	36	640	Washington
3317-06-79	1S 2W	6	157	Canyon/Owyhee
-07-79	1S 2W	7	30	Canyon/Owyhee
-08	1S 2W	8	166	Canyon/Owyhee
-10	1S 2W	10	40	Canyon/Owyhee
-16	1S 2W	16	640	Canyon
-17	1S 2W	17	251	Canyon/Owyhee
-20	1S 2W	20	58	Canyon/Owyhee
-21	1S 2W	21	21	Canyon/Owyhee
-26	1S 2W	26	26	Canyon
-27	1S 2W	27	27	Canyon/Owyhee
-28	1S 2W	28	115	Canyon/Owyhee
-34	1S 2W	34	140	Owyhee
-35	1S 2W	35	52	Owyhee
3505-06-78	2S 1W	6	62	Owyhee/Ada
3507-03-78	2S 2W	3	83	Owyhee
3527-07-78	3S 1W	7	100	Owyhee
-08	3S 1W	8	160	Owyhee
-09	3S 1W	9	80	Owyhee
-18	3S 1W	18	160	Owyhee
3541-36-79	3S 7E	36	640	Elmore
3543-04-79	3S 8E	4	80	Elmore
-09	3S 8E	9	80	Elmore
-10-79	3S 8E	10	81	Elmore
-13	3S 8E	13	80	Elmore
-14	3S 8E	14	40	Elmore
-15	3S 8E	15	40	Elmore
-24	3S 8E	24	120	Elmore
3545-36-79	3S 9E	36	644	Elmore
-36-79 (a)	3S 10E	36	640	Elmore
3679-29-79	4S 17E	29	200	Lincoln
-31	4S 17E	31	208	Lincoln
-36	4S 17E	36	640	Lincoln
3681-25-79	4S 16E	25	80	Lincoln
-36	4S 16E	36	480	Lincoln
3683-36-79	4S 15E	36	400	Gooding
3685-36-79	4S 14E	36	640	Gooding
3693-16-79 (a)	4S 10E	16	640	Elmore
-36-79 (a)	4S 10E	36	640	Elmore
3695-36-79 (a)	4S 9E	36	640	Elmore
3697-10-78 (a)	4S 8E	10	640	Elmore
3699-36-79 (a)	4S 7E	36	640	Elmore
3741-02-78	5S 3E	2	280	Elmore
-05	5S 3E	5	95	Elmore
-06	5S 3E	6	157	Elmore/Owyhee
-09	5S 3E	9	62	Elmore/Owyhee
-15	5S 3E	15	113	Elmore/Owyhee
-22	5S 3E	22	27	Owyhee

TABLE 3.7.1 - Continued

UNION OIL CO. OF CALIF. (Continued)

<u>Lease No.</u>	<u>Location</u>	<u>Section</u>	<u>Acres</u>	<u>County</u>
3741-24-78	5S 3E	24	79	Elmore/Owyhee
3743-19-79	5S 4E	19	11	Elmore/Owyhee
-30-79	5S 4E	30	138	Elmore/Owyhee
-31	5S 4E	31	16	Elmore/Owyhee
-32	5S 4E	32	101	Elmore/Owyhee
-33	5S 4E	33	79	Elmore/Owyhee
3753-16-79 (a)	5S 9E	16	640	Elmore
-12-79 (a)	5S 10E	12	55	Elmore
-13 (a)	5S 10E	13	24	Elmore
-14 (a)	5S 10E	14	102	Elmore
-16 (a)	5S 10E	16	640	Elmore
3763-16-79	5S 14E	16	640	Gooding
3765-16-79	5S 15E	16	120	Gooding
-29	5S 15E	29	80	Gooding
3767-10-79	5S 16E	10	80	Lincoln
-16	5S 16E	16	640	Lincoln
3769-01-79	5S 17E	1	40	Lincoln
-06	5S 17E	6	80	Lincoln
-07	5S 17E	7	86	Lincoln
-16	5S 17E	16	560	Lincoln
3909-16-78	6S 6E	16	640	Owyhee
-36-78	6S 6E	36	640	Owyhee

(a) 50% Magma Energy

TABLE 3.7.2 -

TOTAL GEOTHERMAL STATE LEASES

Amax	8,320
Andarko	12,612
Britt	23,512
Bullock	2,218
Chevron	10,562
Hoefle	7,040
Kanta	1,562
Magma	10,651
OXY Geothermal	28,606
Phillips	58,306
Raft River R.E.A.	1,280
Simasko	5,240
Southland Royalty	2,588
L. Spangler	640
Sunoco	2,800
Supron	27,737
Union	<u>131,707</u>
Total State Acres Under Lease	335,381

3.8 The Role of The Public Utilities Commission

3.8.1 Public Utility

Under Idaho Code (Sec. 61-129), the term "public utility" covers all cases where the service is performed and the commodity delivered directly to the public or some portion thereof and where the service is performed or the commodity delivered to any corporation, corporations, person, or persons, who in turn, either directly or indirectly or mediately or immediately, performs the service, or delivers such commodity to or for the public, or some portion thereof. Under the broad definition of a public utility, the Idaho Code includes, in addition to such common carriers as railroad, pipeline, gas, electrical, and telephone corporations, any water corporation owning, controlling, operating or managing any water system for compensation within the state. Any privately owned geothermal district heating system, supplying hot water to the public, will be included in the definition of a water corporation.

3.8.2 Certificate of Convenience and Necessity

No public utility, including water corporations, shall begin construction or extension of their service systems, without having first obtained from the Public Utilities Commission a certificate that the present or future public convenience and necessity require or will require such construction. (Idaho Code 61-526)

Exclusions and Exemptions:

Municipal corporations, mutual nonprofit or cooperative corporations and water systems for irrigation of Carey Act Lands are exempt from the regulations of the Public Utilities Commission. The Warm Springs Water District, the oldest geothermal district heating system in the United States, is a nonprofit cooperative which operates under these exemptions. (Idaho Code 61-104)

3.8.3 Rate and Securities Regulation

The Idaho Public Utilities Commission regulates rates for all public utilities (Idaho Code 61-305). The Public Utilities Commission in the exercise of its authority to see that rates both as a whole and for each particular service, are just to the utility and reasonable to the consumer and nondiscriminator as between consumers, may not only fix rates for each class but may classify.

The Public Utilities Commission also has prior approval over securities issued by public utilities and water corporations, except for bonds which mature within twelve months. (Idaho Code 61-902)

3.9 Mineral and Energy Taxes in Idaho

Table 3.9 lists the state mineral and energy tax currently in effect in Idaho. These taxes are in addition to any royalties and rentals associated with resource development.

4.0 Analysis of Federal Geothermal Leasing in Idaho

4.1 Introduction

There are five federal agencies which act in a regulatory role regarding geothermal resource development on federal lands. The Bureau of Land Management (BLM) is the major agency regulating federal land under consideration for geothermal resource development. The BLM issues leases and exploration permits and conducts environmental studies on lands under BLM surface management.

The U.S. Geological Survey has two major functions. The Geological Division evaluates the land and resources for leasing. The Conservation Division is charged with insuring that all lease obligations and regulations are met. The Conservation Division also processes environmental statements on drilling operations and plant construction, issues drilling permits, certifies plant sites and issues construction permits.

The U.S. Fish and Wildlife Service also processes environmental statements and can recommend areas be withheld from leasing or development.

The U.S. Forest Service is a major surface management agency in Idaho. This agency conducts environmental analysis regarding geothermal leasing and development on National Forest lands.

The Environmental Protection Agency also reviews environmental impact statements and monitors developing sites for air and water pollution.

Inherent in the number of agencies involved at the Federal level is the time factor required to process leases, reports and permits. The slow development of geothermal resources in Idaho is in part due to a reluctance of Industry to explore on federal lands and in part due to the time requirements inherent of the federal institutional matrix.

Leasing is currently the only private development activity occurring on federal lands in Idaho. This report analyzes the federal leasing program in Idaho and identifies the time requirements for processing lease applications, the number of applications being processed and their current status, and the extent and location of individual lease holdings in Idaho.

TABLE 3.9
IDAHO MINERAL AND ENERGY TAXES

<u>KIND OF TAX</u>	<u>STATUTORY REFERENCE</u>	<u>MEASURES AND RATE OF TAX</u>
Corporate Income and Corporate Franchise Tax	IDAHO CODE § 63-3025, § 63-3025A	6.5% taxable income from instate sources
Property Tax	IDAHO CODE § 63-2801 et seq.	Productive mines: net annual profits, plus (1) price paid to U.S. for mines and claims or (2) separate value of surface ground used for other purposes plus value of machinery, property and surface improvements. All other lands, realty and personalty assessed at 1% of full market value.
Mining License Tax	IDAHO CODE § 47-1201 et seq.	2% of net value of royalties received or ores mined or extracted
Oil and Gas Production Tax	IDAHO CODE § 47-330	Rate is 5 mills per barrel of oil or per 50,000 cubic feet of gas produced. Levied for purposes of administering regulation of oil and gas industry.
Energy Deduction for Alternative Energy Device on Residences	IDAHO CODE § 63-3022C	Effective retroactively to January 1, 1976, individual taxpayers may deduct from taxable income due under Idaho income tax: 40% of the amount paid or accrued that is properly attributable to the construction, remodeling, installation or acquisition of an alternative energy device on a place of residence, and 20% per year thereafter for three succeeding years. The deduction may not exceed \$5000 in any one taxable year. Alternative energy device includes GEOTHERMAL RESOURCES.

4.2 Lease Procedure Time Factors Non-Competitive Leasing

Noncompetitive lease applications for geothermal lease may be filed on lands which are not within a known geothermal resource area (KGRA). The first qualified applicant to file for non-KGRA acreage is entitled to a lease upon payment of \$1 per acre annual rental and a minimal service charge. Lease applications are subject to rejection for various specific reasons, such as, environmental concerns and withdrawal from mineral entry. The decision of the land management agencies (BLM and FS) to lease specific lands for geothermal development is largely predicated on the results of an environmental review. This review is mandated by the National Environmental Policy Act of 1979, (NEPA, P.L. 91-190).

There are several institutional steps involved in processing a federal noncompetitive geothermal lease and the permits that are necessary to develop that lease. Those actions which are of concern in Idaho, at this time, are delays in the lease issuance process.

WAPORA Corporation of Washington, D.C. recently completed a preliminary analysis of leasing delays for the Department of Energy. WAPORA analyzed time lags which occur during major steps in the lease application review. Performance at each stage is measured in several ways. The major breakdowns of data which is of concern to this report are: 1) the time lag for applications which have reached a given milestone and have been processed through it, and 2) the time lag for applications which have reached a milestone and are still awaiting action to complete that step in the process.

Six major steps in the leasing process were examined. The first major step in the lease application review is the transmittal of the lease application from the State Office of the BLM to the appropriate BLM District Office or Forest Service Regional Office. All lease applications are filed with the State Office of the BLM whether or not forest service lands are involved. The application is recorded and dated upon receipt by the BLM State Office and transmitted to the appropriate land management district office.

In Idaho, the average time lag between the date of application and transmittal to the District BLM Forest Service Office is 35 weeks for BLM lands and 41 weeks for Forest Service lands. Applications still pending action at this step in the process have been held at this point an average of 97 weeks for BLM lands and 131 weeks for Forest Service lands.

Leases which have successfully been processed through this initial step in the leasing processes have a residence time of approximately six months. Delays of up to two years are common.

The second major step in the leasing process is the consideration of the application by the BLM District Office or Forest Service Regional Office. At this stage, environmental reviews are conducted and special stipulations are developed. When these considerations are completed the lease application is returned to the BLM State Office. The time lapse between receipt of the application at the District/Forest Service Regional Offices and its return to the BLM State Office averages 45 weeks for BLM lands in Idaho.

All lease applications in Idaho for forest service land are currently pending action at this step in the leasing process. These lease applications have been delayed at this step for an average of 161 weeks.

BLM leases which are still pending action by the District Offices have been held at this step in the leasing process for an average of 54 weeks.

It should be noted that a significant number of withdrawals and rejections occur this step in the process.

The third step in the leasing process is the transmittal of the application from the BLM State Office to the U.S. Geological Survey for stipulation review. The average overall turn-around time for this transmittal in Idaho is 22 weeks for BLM lease applications. Leases still awaiting transmittal have been pending for 94 weeks for BLM lands and 28 weeks for U.S. Forest Service Lands.

Since there are no decision points involved in the process at this step any delays can be considered significant. The majority of lease applications in process have passed through this step. Only a few leases are still pending action over an extended period of time. A delay of 28 weeks for the average transmittal time can be considered a significant "dead time" factor.

The fourth step in the leasing process is the U.S. Geological Survey review of stipulations which are to be included as part of the lease. The U.S.G.S. reviews lease stipulations recommended by the surface management agency and can add additional stipulation.

The average turn-around time for the U.S.G.S. lease stipulation review is 4 weeks for BLM lease applications. No Forest Service lease applications have reached this step in the application review process. Some leases are still pending action by the U.S.G.S. in areas of more extreme environmental sensitivity. There are a minor number of leases which have been pending action for an average of 51 weeks.

It should be noted that the U.S.G.S. is very expeditious in handling lease applications at this step in the process. This is partially due to the low environmental sensitivity of lease areas whose applications have succeeded to this step in the application review process. Lease applications for areas with a high degree of environmental sensitivity generally have not succeeded to this step in the review process.

The fifth time lapse phase, reviewed by WAPORA, is between the U.S.G.S. stipulation review and the KGRA listing. During this period, the BLM prepares the lease, requests bonds and submits the lease to the applicant for signature. When the BLM receives the signed lease it is forwarded to the U.S.G.S. for final KGRA clear listing. The time elements in this step include BLM actions and the mailing of the lease for signature and its return to BLM. The average time lapse for lease applications in this step is 16 weeks. Considering the fact that the time frame includes BLM preparation of the lease and mailing to the applicant for signature and return, a four month time frame is not unrealistic.

The sixth major procedural step, reviewed by WAPORA, is the time lapse between the U.S.G.S. clear listing and final disposition of the application. This step involves administrative handling only if the clear listing results in lease issuance. All decisions have been made at this point. All that is required is BLM signature and mailing of a copy to the lessee, and district office. The average time lapse for lease applications at this step in the procedure is 7 weeks.

The above discussion illustrates how each step in the leasing process contributes to the total processing time. These time frames clearly define the long delays in obtaining a lease, the frequency of inaction on applications, and a general non-uniformity of the system. The average period for obtaining a lease from the BLM in Idaho is 98 weeks.

Out of 656 lease applications filed with the BLM as of November, 1979, 165 leases have been issued. The U.S. Forest Service has issued only one lease in Idaho out of 365 lease applications. Table 4.2 is a summary status report of non-competitive lease applications in Idaho.

Out of a total of 1016 lease applications filed with the State Office of the BLM for U.S. Forest Service and Bureau of Land Management lands, twenty-seven percent have been withdrawn, seventeen percent have been rejected, thirty-six percent are awaiting action, three percent have been refused by the applicant and sixteen percent of the total lease applications have been issued. Twenty-five percent of the applications for BLM lands have been issued and less than one percent of the applications for the U.S. Forest Service lands have been issued.

Table 4.2

NONCOMPETITIVE GEOTHERMAL LEASING
SUMMARY STATUS REPORT, IDAHO

October 1, 1978

APPLICATIONS

<u>BLM</u>	<u>FILED</u>		<u>SUBTOTAL</u>	<u>WITHDRAWN</u>	<u>REJECTED</u>	<u>AWAITING (1) ACTION</u>		<u>REFUSED</u>
	<u>FS</u>					<u>BLM</u>	<u>FS</u>	
651	334		984	271	175	172	183	30
BLM & FS =			<u>32</u>				<u>20</u>	
			1017				375	

LEASES

<u>BLM</u>	<u>ISSUED</u>		<u>SUBTOTAL</u>	<u>BLM</u>	<u>ACRES</u>		<u>SUBTOTAL</u>
	<u>FS</u>				<u>FS</u>		
165	1		166				
				291,285.15			
					2,560.00		
							293,945.15

(1) Applications awaiting action for the following reasons:

- 3 Awaiting KGRA report from USGS
- 130 Pending preparation of EAR (BLM only)
- 173 Awaiting comment of other agencies
- 0 Lease forwarded for signature
- 69 Processing (Adjudication) - BLM

(2) 68 Leases relinquished or terminated (112,931.59 acres)

The large number of withdrawn lease applications may reflect applicant dissatisfaction with lease stipulation which would be attached to the lease. In addition to restrictions applied through special stipulations, the large number of withdrawn applications could also be due to decreased interest in the land resulting from increased geological information, limitations on total acreage and delays in processing.

4.3 Analysis of Competitive Leasing

Nine known Geothermal Resource Areas (KGRAs) have been designated in Idaho. Table 4.3 lists the KGRAs and their total acres and the amount of acres that have been leased. Because these lands are considered to have higher promise than non-KGRA lands, it would be reasonable to expect higher rates of leasing within the KGRAs. Comparatively, the KGRA leasing does show a slightly higher percent of land leased.

In Idaho, 178,018 acres of Federal lands have been classified as KGRA lands. Approximately 60% of this acreage is theoretically available for leasing. Only 26% of the KGRA lands (45,925 acres) have been offered for sale. Leases have been issued on successful bids for 31,905 acres which accounts for only 23% of the KGRA acreage. Table 4.3 lists the leases, lessee, location, and acreage for leases within individual KGRAs in Idaho.

U.S. Forest Service lands account for 26% of the total KGRA acreage in Idaho. No U.S. Forest Service lands have been offered for lease sale as of November, 1979.

BLM lands account for 84% of the total KGRA acreage (128,916 acres) in Idaho.

Although approximately 50% of the total Bureau of Land Management KGRA lands are theoretically available for lease sale, only 35% (45,925 acres) have been offered for competitive bid. Lease sales within Idaho's KGRAs account for 31,905 acres or 69% of the BLM lands which have been offered for lease. The remaining 31% of the BLM lands offered for sale (14,035 acres) were not bid upon. All of the unsold acreage is located within the Raft River KGRA.

Reasons for the relatively small percent of total KGRA lands which have been leased in Idaho are: 1) a total lack of lease sale on U.S. Forest Service lands which account for 26% of the total acreage, and 2) environmental withdrawals which have prevented lease sales on approximately forty percent of the KGRA lands.

Table 4.3

KNOWN GEOTHERMAL RESOURCE AREAS
ACREAGES, AND LESSEES

October 1, 1979

<u>KGRA Name</u>	<u>ACREAGE</u>	<u>LESSEES</u>
Conda	2,566	None
Yellowstone	14,164	None
Vulcan	3,836	None
Island Park	28,539	None
Crane Creek	4,342	Supron Energy Corp. (1,380)
Castle Creek	79,722	Dow Chemical Co., (2,080); Geothermal Resources International Inc., (2,353); Occidental Geothermal Inc. (6,413); Phillips Petroleum Co. (5,025); R.A. Pomeroy (2,492); L.J. Spangler (2,560). Total: 20,922
Bruneau	5,120	Occidental Geothermal INc. (2,600)
Mountain Home	9,520	Union Oil of Calif. and Magma Energy Inc. (5,102)
Raft River	30,209	Raft River Rural Electrical Cooperative (1,883)
TOTAL KGRAS	178,018	Total Acres Leased (competitive leases): 31,905

4.4 Federal Geothermal Leases

Table 4.4 lists the Federal competitive leases in Idaho by KGRA and lessee. Table 4.5 lists all Federal leases in Idaho by lessee. Table 4.6 lists all Federal leases in Idaho by Township and Range. The data in Table 4.6 is plotted on the state map at a scale of 1:1,000,000 with a resolution of one section (See appendix).

TABLE 4.4

FEDERAL KGRA GEOTHERMAL LEASES IN IDAHO

Current to July 11, 1979

BRUNEAU KGRA

Oxy Petroleum, Inc. (75%) and The Louisiana Land & Exploration Co. (25%) Total Acres: 2600.0

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-9545	T7S R6E Sec. 14,15,23,26	8-1-75
I-9546	T7S R6E Sec. 21,27,28	

CASTLE CREEK KGRA

Occidental Geothermal, Inc. (75%) and The Louisiana Land & Exploration Co. (25%) Total Acres: 6413.27

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-10080	T4S R1E Sec. 35	
	T5S R1E Sec. 1,2,3,10,11	1-1-76
I-10081	T5S R2E Sec. 7,8,17,18	1-1-76
I-10083	T5S R1E Sec. 12,13,14	1-1-76

Pomeroy, Russell A. Total Acres: 2492.0

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-10079	T4S R1E Sec. 10,20,21,28,29	1-1-76

Geothermal Resources International, Inc. Total Acres: 2353.15

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-10082	T4S R1E Sec. 31,32,33,32	
	T5S R1E Sec. 3,4	12-1-75

The Dow Chemical Co., USA Total Acres: 2080.0

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-10084(a)	T5S R1E Sec. 9,15,21,22	3-1-76

(a)Lease Terminated 3-1-79

TABLE 4.4 - Continued

Phillips Petroleum Co. Total Acres: 5025.26

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-10085	T5S R1E Sec. 23,24,25,26	1-1-76
I-10086	T5S R2E Sec. 10,20,29,30	1-1-76

Spangler, Laura J. Total Acres: 2560.0

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-12298(b)	T5S R2E Sec. 21,22,26,27,28	3-1-77

(b)Lease Terminated 5-1-79

CONDA KGRA

No leases issued; no lease sales; awaiting environmental report.

CRANE CREEK KGRA

Supron Energy Corporation Total Acres: 1380.63

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-12297	T11N R3W Sec. 5,6,18 T11N R4W Sec. 1,12	1-1-77

ISLAND PARK KGRA

No leases issued; no lease sales; awaiting final Environmental Impact Statement.

MOUNTAIN HOME KGRA

Union Oil Co. of CA. and Magma Energy, Inc. Total Acres: 5102.5

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-14167	T3S R8E Sec. 34,35	
	T4S R8E Sec. 1,2,3	1-1-78
I-14168	T4S R9E Sec. 6,7,8,9,17, 18,19,20,21	1-1-78
I-14169	T4S R9E Sec. 33	1-1-78

TABLE 4.4 - Continued

RAFT RIVER KGRA

Raft River Rural Electric Cooperative, Inc. Total Acres: 1883.1

<u>Lease No.</u>	<u>T. & R., Boise-Meridian</u>	<u>Date Issued</u>
I-14166	T15S R26E Sec. 14,15,21,22, 28,29,32	4-1-78

VULCAN KGRA

No leases issued; no lease sales; awaiting Environmental Impact Statement.

YELLOWSTONE KGRA

No leases issued; no lease sales; awaiting final Environmental Impact Statement.

TABLE 4.5

FEDERAL GEOTHERMAL LEASES

IN IDAHO

BY

LESSEE

Current to July 11, 1979

TABLE 4.5

Amax Exploration, Inc.
4704 Harlan St.
Denver, CO 80212

Total Acres:
7501.2

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-13321	7-1-78	T8S R5E Sec. 15,20,26,33	2560	Owyhee
I-13323	7-1-78	T8S R5E Sec. 7,23,38,35	2558.56	Owyhee
I-13324	7-1-78	T8S R5E Sec. 6,22,23,34	2382.59	Owyhee

L.H. Armour, Jr.
Room 1940, 135 So. LaSalle St.
Chicago, Illinois 60603

Total Acres:
1480.0

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7673	9-1-76	T5S R27E Sec. 15,20,27	1480	Cassia

Atlantic Richfield Co.
P.O. Box 2819
Dallas, Texas 75221

Total Acres:
18868.9

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-8993	7-1-75	T8S R6E Sec. 2,11,14,23	2272.39	Owyhee
I-8994	7-1-75	T8S R6E Sec. 4,9,21,28	2387.21	Owyhee
I-8995	7-1-75	T8S R6E Sec. 26,27,34,35	2560	Owyhee
I-8996	7-1-75	T8S R6E Sec. 1,12,13,24	2379.7	Owyhee
I-8997	7-1-75	T8S R6E Sec. 3,10,15,22	2273.69	Owyhee
I-8998	7-1-75	T8S R6E Sec. 5,6,7,8	1672.03	Owyhee
I-12689	7-1-78	T12N R3W Sec. 29,30 T12N R4W Sec. 24	1807.84	Washington
I-12690	7-1-78	T10N R3W Sec. 23,24,25 T10N R2W Sec. 30	1961.55	Washington

TABLE 4.5 - Continued

Atlantic Richfield Company (cont.)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-12691	7-1-78	T10N R2W Sec. 19,20,29,32	1839.47	Washington
I-13032	7-1-78	T12N R4W Sec. 23	160	Washington

Delta Funds, Inc.
1401 Walnut Street
Philadelphia, PA 19102

Total Acres:
5762.0

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-9513	10-1-76 Lease Term. 10-1-78	T15S R27E Sec. 12,24,34	1520	Cassia
I-9514	10-1-76 Lease Term. 10-1-78	T14S R27E Sec. 10,11,15	1920	Cassia
I-9515	10-1-76 Lease Term. 10-1-78	T16S R27E Sec. 19,22,28, 29,30	1360.66	Cassia
I-9516	10-1-76 Lease Term. 10-1-78	T16S R26E Sec.24,30	961.25	Cassia

Dow Chemical, USA
Oil & Gas Division
2855 Mitchell Dr, Suite 150
Walnut Creek, CA 94598

Total Acres: 7355
Less Terminations 2080
Net Acres: 5275

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-8339	8-1-75 Lease Term. 8-1-79	T6S R4E Sec. 27 T7S R4E Sec. 1,10 11,14,15,23 T7S R5E Sec. 6,18	1360	Owyhee
I-8341	8-1-75 Lease Term. 8-1-79	T5S R1E Sec. 20	560	Owyhee
I-8344	8-1-75 Lease Term. 8-1-79	T5S R1E Sec. 5	635.24	Owyhee
I-8346	8-1-75 Lease Term. 8-1-79	T5S R1E Sec. 27	640	Owyhee

TABLE 4.5 - Continued

Dow Chemical, USA (cont.)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-8348	8-1-75 Lease Term. 8-1-79	T6S R4E Sec. 25, 26,34,35 T7S R4E Sec. 3	2080	Owyhee
I-10084 (a)	3-1-76 Lease Term. 3-1-79	T5S R1E Sec. 9,15,21,22	2080	Owyhee

(a) Competitive Bid Lease Sale - KGRA - Castle Creek

Earth Power Corporation
P.O. Box 1566
Tulsa, OK 74101

Total Acres:
17933.8

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7670	11-1-75	T6S R6E Sec.25, 26,35 T7S R6E Sec. 2	2440.94	Owyhee
I-7688	11-1-75	T6S R6E Sec. 17,18,19,20	2476.76	Owyhee
I-7992	6-1-77 Lease Term. 6-1-79	T6S R2E Sec.11	640	Owyhee
I-7995	6-1-77 Lease Term. 6-1-79	T6S R2E Sec. 3	656.72	Owhyee
I-8045	8-1-75 Lease Term. 8-1-79	T6S R3E Sec. 5	654.08	Owyhee
I-8046	8-1-75 Lease Term. 8-1-79	T6S R3E Sec. 1, 14,17,18	1526.32	Owyhee
I-8047	8-1-75 Lease Term. 8-1-79	T6S R2E Sec.2,12 T6S R3E Sec.7,15	2500.84	Owyhee
I-8049	11-1-75	T5S R2E Sec. 35 T6S R3E Sec. 8	1280	Owyhee
I-8780	6-1-77 Lease Term. 6-1-79	T6S R3E Sec. 6 T5S R2E Sec. 34	1294.46	Owyhee

TABLE 4.5 - Continued

Earth Power Corporation (cont.)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-12995	9-1-77 Lease Term. 8-1-79	T7S R3E Sec. 10,14,15	1920	Owyhee
I-12996	9-1-77 Lease Term. 8-1-79	T6S R2E Sec. 33 T7S R2E Sec.2,3,4	2543.72	Owyhee

Geothermal Resources International, Inc.
467 Admiralty Way
Marina Del Ray, CA 80291

Total Acres:
2353.1

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-10082 (a)	12-1-75	T4S R1E Sec. 31,32,33,34	2353.15	Owyhee

(a) Competitive Base Sale - KGRA - Castle Creek

Caroline Hunt Trust Estate
2500 First National Bank Bldg.
Dallas, Texas 75202

Total Acres:
6596.1

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-9872	3-1-78	T2S R17E Sec. 3,10,13,14	2219.15	Camas
I-9873	3-1-78	T3S R18E Sec. 19,20,21,22,28	2096.88	Camas
I-9875	3-1-78	T2S R18E Sec. 21,28,32	1480	Blaine
I-12325	3-1-78	T2S R17E Sec. 11	240	Camas
I-12327	3-1-78	T2S R18E Sec. 33	560	Blaine

Caroline L. Hunt
1401 Elm St.
Dallas, Texas 75202

Total Acres:
5086

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-9869	3-1-78	T3S R17E Sec. 15,22,23,24	2560	Lincoln
I9870	3-1-78	T4S R18E Sec. 5,6,7,8	2525.95	Lincoln

TABLE 4.5 - Continued

Nancy B. Hunt
 1401 Elm Street
 Dallas, Texas 75202

Total Acres:
 5101.2

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-9838	3-1-78	T3S, R17E, Sec. 35, 36 T3S, R18E, Sec. 31, 32	2,552.53	Lincoln
I-9839	3-1-78	T4S, R18E Sec. 9, 10, 17, 18	2,548.67	Lincoln

Nelson B. Hunt
 1401 Elm Street
 Dallas, Texas 75202

Total Acres
 4824.4

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-9861	3-1-78	T3S, R18E, Sec. 27, 29, 30, 33	2,343.16	Lincoln
I-9862	3-1-78	T3S, R18E, Sec. 35 T4S, R18E, Sec. 1, 3, 12, 13	2,481.15	Lincoln

Norma K. Hunt
 1401 Elm St.
 Dallas, TX 75202

Total Acres
 5041.6

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-9823	3-1-78	T3S, R17E, Sec. 1, 2, 3, 10	2,536.18	Lincoln
I-12025	3-1-78	T2S, R17E, Sec. 25 T2S, R18E, Sec. 29, 30, 31	2,505.4	Camas & Blaine

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-9848	3-1-78	T4S, R18E, Sec. 2, 11, 14, 15	2,240.4	Lincoln
I-9849	3-1-78	T3S, R17E, Sec. 11, 12, 13, 14	2,560	Lincoln

TABLE 4.5 - Continued

Idaho Geothermal Co.
39 Broadway
Suite 3100
New York, NY 10006

Total Acres:
20,829

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7629	8-1-75	T7S, R6E, Sec. 33, 34	1,200	Owyhee
I-7665	8-1-75	T7S, R5E, Sec. 15, 23, 24	1,920	Owyhee
I-7674	11-1-75	T7S, R6E, Sec. 6, 7, 8, 17, 18	2,082.44	Owyhee
I-7696	11-1-75	T7S, R5E, Sec. 11	640	Owyhee
I-7793	8-1-75 Lease Term. 8-1-79	T6S, R6E, Sec. 21, 22, 27, 28	2,560	Owyhee
I-7846	11-1-75	T7S, R6E, Sec. 19, 20, 29, 30	2,558.70	Owyhee
I-8044	6-1-76 Lease Term. 6-1-79	T6S, R5E, Sec. 2, 3, 4, 6, 7, 8, 9, 30	2,390.93	Owyhee
I-9886	1-1-77	T7S, R5E, Sec. 1, 10, 12	1,638.88	Owyhee
I-9887	1-1-77	T6S, R5E, Sec. 12, 22, T6S, R6E, Sec. 7, 8, 9, 30	1,239.06	Owyhee
I-10073	12-1-76	T7S, R6E, Sec. 3, 4, 10, 11	2,199.52	Owyhee
I-10075	12-1-76	T7S, R6E, Sec. 24, 31, 32, 35	2,399.80	Owyhee

Gerald G. Loucks
925 Kohl St.
Broomfield, CO 80020

Total Acres:
17,767.0

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-8026	7-1-75 Lease Term. 7-1-79	T7S, R2E, Sec. 11, 13	1,040	Owyhee
I-8027	7-1-75 Lease Term. 7-1-79	T7S, R2E, Sec. 1, 12 T7S, R3E, Sec. 8,17	2,556.56	Owyhee

TABLE 4.5 - Continued

Gerald G. Loucks (Continued)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-8028	7-1-75 Lease Term. 7-1-79	T7S, R3E Sec. 5,6,7,18	2,524.32	Owyhee
I-8028	7-1-79 Lease Term. 7-1-79	T1S, R3W, Sec. 35	640	Owyhee
I-8030	7-1-75 Lease Term. 7-1-79	T1S, R3W, Sec. 22,23,26,34	1,760.84	Owyhee
I-8983	7-1-75 Lease Term. 7-1-79	T5S, R2E, Sec. 31 T6S, R2E, Sec. 5,6	1,940.19	Owyhee
I-8984	7-1-75	T5S, R1W, Sec. 1, 2,3,4	2,048.82	Owyhee
I-8989	7-1-75	T4S, R1W Sec. 24,25,34,35	1,400	Owyhee
I-8990	8-1-75 Lease Term. 8-1-79	T5S, R1E Sec. 32,33,34,35	2,560	Owyhee
I-8991	8-1-75 Lease Term. 8-1-79	T5S, R2E, Sec. 32 T6S, R2E, Sec. 4	1,296.28	Owyhee
I-8988	7-1-75	T5S, R1W, Sec. 9,10,11,12	2,360	Owyhee

Louisiana Land & Exploration Co.
15th Floor, Denver Club Building
Denver, CO 80202

Total Acres:
9,013.3

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-9545(a) KGRA	8-1-75(b)	T7S, R6E, Sec. 14,15,23,26	1,160.0	Owyhee
I-9546(a) KGRA	8-1-75(b)	T7S, R6E, Sec. 21,27,28	1,440	Owyhee
I-10080(c) KGRA	1-1-76(b)	T4S, R1E, Sec. 35 T5S, R1E, Sec. 1,2,3,10,11	2,475.29	Owyhee
I-10081(c) KGRA	1-1-76(b)	T5S, R2E, Sec. 7,8,17,18	2,217.98	Owyhee
I-10083(c) KGRA	1-1-76(b)	T5S, R1E, Sec. 12,13,14	1,720	Owyhee

TABLE 4.5 - Continued

Louisiana Land & Exploration Co. (Continued)

Bruneau (a) Leaseholding is Louisiana Land & Exploration Co. - 25%,
 OXY Petroleum, Inc. 75%

(b) Competitive lease sale - KGRA

Castle Creek (c) 75% lease ownership jointly held by Occidental Geothermal, Inc.

Magma Energy, Inc.
 631 S. Witmer St.
 Los Angeles, CA 90017

Total Acres:
 22,103.5

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7614(a)	6-1-76	T3S, R8E, Sec. 15,22,23	880	Elmore
I-7721(a)	8-1-75	T4S, R8E, Sec. 15,22, 27, 34 T4S, R9E, Sec. 31,32	1,467.98	Elmore
I-7753(a)	6-1-76	T3S, R9E, Sec. 30,31	883.61	Elmore
I-7757(a)	5-1-76	T3S, R8E, Sec. 25,26	680	Elmore
I-7834(a)	6-1-76	T3S, R9E, Sec. 33 T4S, R9E, Sec. 4,5	1,222.38	Elmore
I-14208(a)	8-1-78	T4S, R8E, Sec. 5,6,7,8	2,538.48	Elmore
I-14209(a)	8-1-78	T5S, R9E, Sec. 2,3,10,11	2,559.42	Elmore
I-14210(a)	8-1-78	T4S, R9E, Sec. 26,27,34,35	2,560	Elmore
I-14211(a)	8-1-78	T4S, R8E, Sec. 29,30 T5S, R8E, Sec. 2,3	2,229.06	Elmore
I-14212(a)	8-1-78	T4S, R9E, Sec. 14,15,22,23	2,360	Elmore
I-14213(a)	8-1-78	T5S, R8E, Sec. 1 T5S, R9E, Sec. 4,5, 6,9	2,258.67	Elmore
I-14214(a)	8-1-78	T4S, R8E, Sec. 17,18,19,20	2,463.82	Elmore
I-14167(a) KGRA	1-1-78 (b)	T3S, R8E, Sec. 34,35 T4S, R8E, Sec. 1,2,3	2,434.96	Elmore

TABLE 4.5 - Continued

Magma Energy, Inc. (Continued)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-14168(a) KGRA	1-1-78(b)	T4S, R9E, Sec. 6,7,8,9,17, 18,19,20,21	2,507.54	Elmore
I-14169(a) KGRA	1-1-78(b)	T4S, R9E, Sec. 33	160	Elmore

(a) 50% ownership held by Union Oil of CA
 (b) Competitive Geo lease - Mountain Home KGRA

Jerome P. McHugh
 600 S. Cherrt St.
 Suite 1225
 Denver, CO 80222

Total Acres:
 1,320

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-8034	5-1-76	T4S, R9E, Sec. 1,2,10,11,12	1,320	Elmore

Occidental Geothermal, Inc.
 5000 Stockdale Hwy.
 Bakersfield, CA 93309

Total Acres:
 6,413.3

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-10080(a) KGRA	1-1-76(b)	T4S, R1E, Sec. 35 T5S, R1E, Sec. 1,2, 3,10,11	2,475.29	Owyhee
I-10081(a) KGRA	1-1-76(b)	T5S, R2E, Sec. 7,8,17,18	2,217.98	Owyhee
I-10083(a) KGRA	1-1-76(b)	T5S, R1E, Sec. 12,13,14	1,720	Owyhee

(a) Competitive lease sale - KGRA Castle Creek
 (b) 25% ownership jointly held by the Louisiana Land & Exploration Co.

OXY Petroleum, Inc.
 5000 Stockdale Hwy.
 Bakersfield, CA 93309

Total Acres:
 2,600

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-9545(a) KGRA	8-1-75(b)	T7S, R6E, Sec. 14,15, 23,26	1,160	Owyhee
I-9546(a) KGRA	8-1-75(b)	T7S, R6E, Sec. 21,27, 28	1,440	Owyhee

TABLE 4.5 - Continued

OXY Petroleum, Inc. (Continued)

- (a) Lease ownership: OXY Petroleum - 75%, Louisiana Land and Exploration Co. - 25%
- (b) Competitive lease sale - KGRA

Pacific Energy Corporation
P.O. Box 1287
Ratchez, MS 39120

Total Acres:
2,560

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7620	1-1-76	T2S, R44E, Sec. 13,24,25,36	2,560.0	Bonneville

Phillips Petroleum Company
Geothermal Operations
P.O. Box 239
Salt Lake City, UT 84110

Total Acres:
20,366.6
Less Termination 3,080.9
Net Acres 17,285.7

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7589	7-1-78	T11N, R3W, Sec. 33 T10N, R3W, Sec. 3,4,5	2,104.1	Washington
I-7625 (a)	7-1-78	T10N, R3W, Sec. 7,8,10,11,14	2,480.0	Washington
I-7717	7-1-78	T11N, R3W, Sec. 17,19,20, 29,30,32	1,976.97	Washington
I-7762 (a)	7-1-78	T10N, R3W, Sec. 21,22	880	Washington
I-7792	7-1-78	T14S, R26E, Sec. 1,2,11	1,600.68	Cassia
I-7805 (a)	7-1-78	T11N, R4W, Sec. 11,13,14,25	1,040.00	Washington
I-9989 (a)	7-1-78	T10N, R4W, Sec. 1,2,12 T11N, R4W, Sec. 23,24,26	1,160.88	Washington
I-9990	7-1-78	T10N, R3W, Sec. 6 T11N, R3W, Sec. 21,22,27,28,31, 34	2,178.60	Washington
I-10085 (b) KGRA	1-1-76	T5S, R1E, Sec. 23,24,25,26	2,480	Owyhee

TABLE 4.5 - Continued

Phillips Petroleum Company (Continued)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-10086(a)	1-1-76	T5S, R2E, Sec. 19,20,29,30	2,545.26	Owyhee
I-13443	6-1-78	T7S, R2E, Sec. 17,20,21	1,920	Owyhee

(a) Lease relinquished 2-14-79, case closed
 (b) Competitive Lease Sale - KGRA - Castle Creek

Russell A. Pomeroy
 5449 S. Jasmine
 Englewood, CO 80110

Total Acres:
 11,372.1

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-8019	11-1-75	T7S, R4E, Sec. 13,25 T7S, R5E, Sec. 31,32,33	2,558.04	Owyhee
I-8020	11-1-75	T7S, R5E, Sec. 19,28,29, 30, 34	2,558.52	Owyhee
I-8022	7-1-75 Lease Term. 7-1-79	T3S, R1W, Sec. 17,18,20, 29,30,31	1,283.63	Owyhee
I-8023	7-1-75 Lease Term. 7-1-79	T3S, R1W, Sec. 21,28,32,33	2,480	Owyhee
I-10079(a)	1-1-76 KGRA	T4S, R1E, Sec. 19,20,21,28,29	2,492.0	Owyhee

(a) Competitive Bid Sale - KGRA

Raft River Rural Electric Cooperative, Inc.
 Box 617
 Malta, ID 83342

Total Acres:
 1883.1

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-14166(a)	4-1-78 KGRA	T15S, R26E, Sec. 14,15,21,28, 29,32	1,883.1	Cassia

(a) Competition Bid Lease Sale - KGRA - Raft River

TABLE 4.5 - Continued

Robert W. Smith
 Box 1603
 Boise, ID 83701

Total Acres:
 6,997.4

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-12847	9-1-77	T6S, R6E, Sec. 10,15,29,33	2,520	Owyhee
I-12848	9-1-77	T6S, R5E, Sec. 1,5,10,11, 24; T6S, R6E, Sec. 6	1,631.5	Owyhee
I-12849	6-1-77	T7S, R5E, Sec. 2,5,13,14 T6S, R5E, Sec. 34	1,916.91	Owyhee
I-12850	6-1-77	T7S, R6E, Sec. 1,12,13,25	2,560.5	Owyhee

Snake River Geothermal Co.
 319 Broadway; 31st Floor
 New York, NY 10006

Total Acres:
 11,079.1

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-13208	10-1-77	T7S, R5E, Sec. 27,35 T8S, R5E, Sec. 2,3	2,200.62	Owyhee
I-13209	10-1-77	T7S, R4E, Sec. 22,26,27, 34,35	2,040	Owyhee
I-13210	10-1-77	T7S, R4E, Sec. 9,18,21	1,896.72	Owyhee
I-13211	10-1-77	T8S, R5E, Sec. 1,10,11,12	2,381.8	Owyhee
I-13212	10-1-77	T6S, R3E, Sec. 35 T7S, R3E, Sec. 23 T7S, R4E, Sec. 8,17	2,560	Owyhee

Laura J. Spangler
 2827 Venus Place
 Boise, ID 83704

Total Acres:
 10,100.1

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-12769	5-1-77	T5S, R1E Sec. 17,18,19	1,977.44	Owyhee
I-12770	5-1-77 Lease Term. 5-1-79	T5S, R1E, Sec. 30,31	1,336.7	Owyhee

TABLE 4.5 - Continued

Laura J. Spangler (Cont'd.)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-12774	5-1-77	T5S, R1E, Sec. 6,7,8	1,965.98	Owyhee
I-12775	5-1-77 Lease Term. 5-1-79	T5S, R1W, Sec. 22,23,25,26	2,560	Owyhee
I-12776	5-1-77 Lease Term. 5-1-79	T5S, R1W. Sec. 13,14,15,24	2,560	Owyhee
I-12298(a)	5-1-77 KGRA Lease Term. 5-1-79	T5S, R2E, Sec. 21,22,26, 27,28	2,560	Owyhee
I-12771	6-1-77	T6S, R3E, Sec. 25,26,34	1,680	Owyhee

(a) Competitive lease sale - Castle Creek KGRA

Dwayne C. Spangler
2827 Venus Place
Boise, ID 83704

Total Acres:
1,575.5

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-12777	(Not issued yet)			
I-12778	6-1-77	T7S, R4E, Sec. 4,5,6	1,575.52	Owyhee

Sunoco Energy Development Co.
12700 Park Central Place
Suite 1500
Dallas, Texas 75251

Total Acres:

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7617	7-1-75	T14S, R27E, Sec. 25	640	Cassia
I-7633	12-1-76	T14S, R26E, Sec. 31,32 T15S, R26E, Sec. 5	1,777.55	Cassia
I-7634	2-1-78	T15S, R26E Sec. 20,21,29	1,441.93	Cassia
I-7660	12-1-76	T16S, R26E, Sec. 8,9,17,20	1,680	Cassia

TABLE 4.5 - Continued

Sunoco Energy Development Co. (Cont'd.)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7702	8-1-75	T14S, R27E, Sec. 21,28	800	Cassia
I-7710	10-1-77	T16S, R26E, Sec. 3,10,15	1,713.74	Cassia
I-7720	5-1-76	T13S, R26E, Sec. 25	240	Cassia
I-7781	7-1-75 Lease Term. 7-1-79	T13S, R27E, Sec. 25,26,35	1,920	Cassia
I-7802	7-1-75 Lease Term. 7-1-79	T14S, R27E, Sec. 26,35	1,280	Cassia
I-7844	7-1-75 Lease Term. 7-1-79	T15S, R27E, Sec. 35 T16S, R27E, Sec. 1,2,11	1,501.72	Cassia
I-9376	9-1-76	T16S, R27E, Sec. 5,6,7,8,18	1,708.8	Cassia
I-9377	9-1-76	T16S, R28E, Sec. 5,7	481.29	Cassia

Supron Energy Corp.
Building V; Fifth Floor
10300 North Central Expressway
Dallas, TX 75231

Total Acres:
1,380.6

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-12297(a)	1-1-77	T11N, R3W, Sec. 5,6,18 T11N, R4W, Sec. 1,12	1,380.63	Washington

(a) KGRA - Crane Creek - Competitive Bid Lease Sale

TABLE 4.5 - Continued

Thermal Resources, Inc.
 39 Broadway; 31st Floor
 New York, NY 10006

Total Acres:
 18,756.5

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7595	11-1-75	T7S, R5E, Sec. 3,4,8,9 T6S, R5E, Sec. 33	1,278.64	Owyhee
I-7643	11-1-75	T6S, R5E, Sec. 13,14	600	Owyhee
I-7776	11-1-75	T7S, R5E, Sec. 17,20,21,22	2,160	Owyhee
I-10408	6-1-77 Lease Term. 6-1-79	T6S, R2E, Sec. 13,24,25	1,920	Owyhee
I-10409	6-1-77 Lease Term. 6-1-79	T6S, R3E, Sec. 19,20,32	1,926.24	Owyhee
I-10410	6-1-77 Lease Term. 6-1-79	T6S, R3E Sec. 22,28,29,31	2,562.8	Owyhee
I-10411	6-1-77 Lease Term. 6-1-79	T6S, R3E, Sec. 21,30,33	1,925.8	Owyhee
I-12684	7-1-77 Lease Term. 7-1-79	T7S, R3E, Sec. 9,26 T7S, R4E, Sec. 20	1,920	Owyhee
I-12685	7-1-77 Lease Term. 7-1-79	T6S, R1E, Sec. 24 T6S, R2E, Sec. 19	1,273.56	Owyhee
I-12687	7-1-77 Lease Term. 7-1-79	T6S, R1E, Sec. 4,13,14	1,929.6	Owyhee
I-12688	7-1-77 Lease Term. 7-1-79	T7S, R3E, Sec. 13 T7S, R4E, Sec. 19	1,259.92	Owyhee

TABLE 4.5 - Continued

Union Oil Co. of CA
P.O. Box 7600
Los Angeles, CA 90051

Total Acres:
26,740.8

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7614(a)	6-1-76	T3S, R8E, Sec. 15,22,23	880	Elmore
I-7727(a)	8-1-75	T4S, R8E, Sec. 15,22,27,34 T4S, R9E, Sec. 31,32	1,467.98	Elmore
I-7733(a)	6-1-76	T3S, R9E, Sec. 30,31	883.61	Elmore
I-7757(a)	5-1-76	T3S, R8E, Sec. 25,26	680	Elmore
I-7808	7-1-75	T6S, R3E, Sec. 2,9,10	640	Owyhee
I-7834(a)	6-1-76	T3S, R9E, Sec. 33 T4S, R9E, Sec. 4,5	1,222.38	Elmore
I-7832	7-1-78	T12N, R3W, Sec. 32	640	Washington
I-8191	7-1-78	T11N, R3W, Sec. 4 T12N, R3W, Sec. 31	1,242.84	Washington
I-8192	7-1-78	T11N, R4W, T12N, R4W	2,114.54	Washington
I-14208(a)	8-1-78	T4S, R8E, Sec. 5,6,7,8	2,538.48	Elmore
I-14209(a)	8-1-78	T5S, R9E, Sec. 2,3,10,11	2,559.42	Elmore
I-14210(a)	8-1-78	T4S, R9E, Sec. 26,27,34,35	2,560	Elmore
I-14211(a)	8-1-78	T4S, R8E, Sec. 29,30 T5S, R8E, Sec. 2,3	2,229.06	Elmore
I-14212(a)	8-1-78	T4S, R9E, Sec. 14,15,22,23	2,360	Elmore
I-14213(a)	8-1-78	T5S, R8E, Sec. 1 T5S, R9E, Sec. 4,5,6,9	2,258.67	Elmore
I-14214(a)	8-1-78	T4S, R8E, Sec. 17,18,19,20	2,463.82	Elmore

TABLE 4.5 - Continued

Union Oil Co. of CA (Cont'd.)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-14167(a)	1-1-78(b)	KGRA T3S, R8E, Sec. 34,35 T4S, R8E, Sec. 1,2,3	2,434.96	Elmore
I-14168(a)	1-1-78(b)	KGRA T4S, R9E, Sec. 6,7,8,9,17, 18,19,20,21	2,507.54	Elmore
I-14169(a)	1-1-78(b)	KGRA T4S, R9E, Sec. 33	160	Elmore

(a) 50% ownership - Magma Energy

(b) Competitive Lease Sale - Mountain Home KGRA

United States Geothermal Corp.
39 Broadway
New York, NY 10046

Total Acres:
20,116.3

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-12328	7-1-77 Lease Term. 7-1-79	T6S, R1E, Sec. 1,2,3	1,976	Owyhee
I-12329	7-1-77 Lease Term. 7-1-79	T6S, R1E, Sec. 11,12 T6S, R2E, Sec. 7,18	2,536.24	Owyhee
I-12330	7-1-77 Lease Term. 7-1-79	T6S, R2E, Sec. 8,9,10,14	2,560	Owyhee
I-12331	7-1-77 Lease Term. 7-1-79	T6S, R2E, Sec. 15,17,20,21	2,560	Owyhee
I-12332	7-1-77 Lease Term. 7-1-79	T6S, R2E, Sec. 22,23,26,35	2,560	Owyhee
I-12333	7-1-77 Partial Relinquish	T6S, R2E, Sec. 34	640	Owyhee
I-12334	7-1-77 Lease Term. 7-1-79	T7S, R3E, Sec. 4 T6S, R3E, Sec. 27	1,036.79	Owyhee
I-12335	7-1-77 Lease Term. 7-1-79	T7S, R3E, Sec. 1,3,12 T7S, R4E, Sec. 7	2,410.79	Owyhee

TABLE 4.5 - Continued

United States Geothermal Corp. (Cont'd.)

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-12336	7-1-77 Lease Term. 7-1-79	T7S, R3E, Sec. 2,11	1,276.52	Owyhee
I-12338	7-1-77 Lease Term. 7-1-79	T7S, R5E, Sec. 25,26	1,280	Owyhee

Fleet R. White
193 The Masters Circle
Costa Mesa, CA 92627

Total Acres:
1,022

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-14493	7-1-78 Lease Term. 7-1-79	T3S, R1W, Sec. 19,20,29,30	941.97	Owyhee
I-14494	7-1-78 Lease Term. 7-1-79	T3S, R1W, Sec. 21	80.0	Owyhee

E. J. Wilson & Sons
Lidy Hot Springs, Star Route
Dubois, ID 83423

Total Acres:
1,246.4

<u>LEASE NO.</u>	<u>DATE ISSUED</u>	<u>LOCATION</u>	<u>ACREAGE</u>	<u>COUNTY</u>
I-7949	10-1-77	T9N, R33E, Sec. 2 T10N, R33E, Sec. 35	1,246.44	Clark

TABLE 4.6

FEDERAL GEOTHERMAL LEASES IN IDAHO

BY

TOWNSHIP AND RANGE

Current to July 11, 1979

TABLE 4.6

FEDERAL GEOTHERMAL LEASES IN IDAHO BY TOWNSHIP AND RANGE

Location	Section	Lessee	Date Issued	Serial Register No.
T. 12 N. R. 3 W.	29	Atlantic Richfield Co.	7-1-78	I-12689
	30	Atlantic Richfield Co.	7-1-78	I-12689
	31	Union Oil Co. of CA	7-1-78	I-8191
	32	Union Oil Co. of CA	7-1-78	I-7832
T. 12 N. R. 4 W.	23	Atlantic Richfield Co.	7-1-78	I-13032
	24	Atlantic Richfield Co.	7-1-78	I-12689
	25	Union Oil Co. of CA	7-1-78	I-8192
	26	Union Oil Co. of CA	7-1-78	I-8192
	35	Union Oil Co. of CA	7-1-78	I-8192
	T. 11 N. R. 3 W.	4	Union Oil Co. of CA	7-1-78
5		Supron Energy Corp.	1-1-77	I-12297
6		Supron Energy Corp.	1-1-77	I-12297
17		Phillips Petroleum Co.	7-1-78	I-7717
18		Supron Energy Co.	1-1-77	I-12297
19		Phillips Petroleum Co.	7-1-78	I-7717
20		Phillips Petroleum Co.	7-1-78	I-7717
21		Phillips Petroleum Co.	7-1-78	I-9990
22		Phillips Petroleum Co.	7-1-78	I-9990
27		Phillips Petroleum Co.	7-1-78	I-9990
29		Phillips Petroleum Co.	7-1-78	I-7717
30		Phillips Petroleum Co.	7-1-78	I-7717
32		Phillips Petroleum Co.	7-1-78	I-7717
33		Phillips Petroleum Co.	7-1-78	I-7589
T. 11 N. R. 4 W.		1	Supron Energy Corp.	1-1-77
	2	Union Oil Co. of CA	7-1-78	I-8192
	12	Supron Energy Corp.	1-1-77	I-12297
	15	Union Oil Co. of CA	7-1-78	I-8192
T. 10 N. R. 2 W.	19	Atlantic Richfield Co.	7-1-78	I-12691
	20	Atlantic Richfield Co.	7-1-78	I-12691
	29	Atlantic Richfield Co.	7-1-78	I-12690
	30	Atlantic Richfield Co.	7-1-78	I-12690
32	Atlantic Richfield Co.	7-1-78	I-12691	

TABLE 4,6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 10 N. R. 3 W.	3	Phillips Petroleum Co.	7-1-78	I-7589
	4	Phillips Petroleum Co.	7-1-78	I-7589
	5	Phillips Petroleum Co.	7-1-78	I-7589
	6	Phillips Petroleum Co.	7-1-78	I-9990
	23	Atlantic Richfield Co.	7-1-78	I-12690
	24	Atlantic Richfield Co.	7-1-78	I-12690
	25	Atlantic Richfield Co.	7-1-78	I-12690
T. 10 N. R. 33 E.	35	E. J. Wilson & Sons	10-1-77	I-7949
T. 9 N. R. 33 E.	2	E. J. Wilson & Sons	10-1-77	I-7949
T. 1 S. R. 3 W.	22	Gerald G. Loucks	7-1-75	I-8030
	23	Gerald G. Loucks	7-1-75	I-8030
	26	Gerald G. Loucks	7-1-75	I-8030
	34	Gerald G. Loucks	7-1-75	I-8030
	35	Gerald G. Loucks	7-1-75	I-8029
T. 2 S. R. 17 E.	3	Caroline Hunt Trust Estate	3-1-78	I-9872
	10	Caroline Hunt Trust Estate	3-1-78	I-9872
	11	Caroline Hunt Trust Estate	3-1-78	I-12325
	13	Caroline Hunt Trust Estate	3-1-78	I-9872
	14	Caroline Hunt Trust Estate	3-1-78	I-9872
	15	Hassie Hunt, Inc.	3-1-78	I-9816
	22	Hassie Hunt, Inc.	3-1-78	I-9816
	23	Hassie Hunt, Inc.	3-1-78	I-9816
	24	Hassie Hunt, Inc.	3-1-78	I-9816
	25	Norma K. Hunt	3-1-78	I-12025
	26	LaMar Hunt	3-1-78	I-9877
	27	LaMar Hunt	3-1-78	I-9877
	34	LaMar Hunt	3-1-78	I-9877
	35	LaMar Hunt	3-1-78	I-9877

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 2 S. R. 18 E.	4	LaMar Hunt	3-1-78	I-9884
	5	LaMar Hunt	3-1-78	I-9884
	6	LaMar Hunt	3-1-78	I-9884
	8	LaMar Hunt	3-1-78	I-9884
	9	Hassie Hunt, Inc.	3-1-78	I-9815
	17	Hassie Hunt, Inc.	3-1-78	I-9815
	19	Hassie Hunt, Inc.	3-1-78	I-9815
	20	Hassie Hunt, Inc.	3-1-78	I-9815
	21	Caroline Hunt Trust Estate	3-1-78	I-9875
	28	Caroline Hunt Trust Estate	3-1-78	I-9875
	29	Norma K. Hunt	3-1-78	I-12025
	30	Norma K. Hunt	3-1-78	I-12025
	21	Norma K. Hunt	3-1-78	I-12025
T. 2 S. R. 44 E.	32	Caroline Hunt Trust Estate	3-1-78	I-9875
	33	Caroline Hunt Trust Estate	3-1-78	I-12327
	13	Pacific Energy Corp.	1-1-76	I-7620
	24	Pacific Energy Corp.	1-1-76	I-7620
	25	Pacific Energy Corp.	1-1-76	I-7620
T. 3 S. R. 1 W.	36	Pacific Energy Corp.	1-1-76	I-7620
	17	Russell A. Pomeroy	7-1-75	I-8022
	18	Russell A. Pomeroy	7-1-75	I-8022
	19	Fleet R. White	7-1-78	I-14493
	20	Fleet R. White and Russell A. Pomeroy	7-1-78	I-14493
	21	Fleet R. White and Russell A. Pomeroy	7-1-75	I-8022
	28	Russell A. Pomeroy	7-1-75	I-14494
	29	Russell A. Pomeroy	7-1-75	I-8023
	30	Fleet R. White and Russell A. Pomeroy	7-1-75	I-8023
	31	Russell A. Pomeroy	7-1-78	I-14493
	32	Russell A. Pomeroy	7-1-75	I-8022
	33	Russell A. Pomeroy	7-1-75	I-14493
		Russell A. Pomeroy	7-1-75	I-8022
		Russell A. Pomeroy	7-1-75	I-14493
		Russell A. Pomeroy	7-1-75	I-8022

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 3 S. R. 8 E.	15	Magma Energy Inc. and Union Oil Co. of CA	6-1-76	I-7614
	22	Magma Energy Inc. and Union Oil Co. of CA	6-1-76	I-7614
	23	Magma Energy Inc. and Union Oil Co. of CA	6-1-76	I-7614
	25	Magma Energy Inc. and Union Oil Co. of CA	5-1-76	I-7757
	26	Magma Energy Inc. and Union Oil Co. of CA	5-1-76	I-7757
	34	Magma Energy Inc. and Union Oil Co. of CA	1-1-78	I-14167
	35	Magma Energy Inc. and Union Oil Co. of CA	1-1-78	I-14167
T. 3 S. R. 9 E.	30	Magma Energy Inc. and Union Oil Co. of CA	6-1-76	I-7733
	31	Magma Energy Inc. and Union Oil Co. of CA	6-1-76	I-7733
	33	Magma Energy Inc. and Union Oil Co. of CA	6-1-76	I-7834
T. 3 S. R. 17 E.	1	Norma K. Hunt	3-1-78	I-9823
	2	Norma K. Hunt	3-1-78	I-9823
	3	Norma K. Hunt	3-1-78	I-9823
	10	Norma K. Hunt	3-1-78	I-9823
	11	W. H. Hunt	3-1-78	I-9849
	12	W. H. Hunt	3-1-78	I-9849
	13	W. H. Hunt	3-1-78	I-9849
	14	W. H. Hunt	3-1-78	I-9849
	15	Caroline L. Hunt	3-1-78	I-9869
	22	Caroline L. Hunt	3-1-78	I-9869
	23	Caroline L. Hunt	3-1-78	I-9869
	24	Caroline L. Hunt	3-1-78	I-9869
	25	LaMar Hunt	3-1-78	I-9883

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 3 S. R. 17 E. (cont'd.)	26	LaMar Hunt	3-1-78	I-9883
	27	LaMar Hunt	3-1-78	I-9883
	34	LaMar Hunt	3-1-78	I-9883
	35	Nancy B. Hunt	3-1-78	I-9838
	36	Nancy B. Hunt	3-1-78	I-9838
	T. 3 S. R. 18 E.	4	LaMar Hunt	3-1-78
5		LaMar Hunt	3-1-78	I-9879
6		LaMar Hunt	3-1-78	I-9879
7		Hassie Hunt, Inc.	3-1-78	I-9817
8		Hassie Hunt, Inc.	3-1-78	I-9817
9		LaMar Hunt	3-1-78	I-9879
17		Hassie Hunt, Inc.	3-1-78	I-9817
18		Hassie Hunt, Inc.	3-1-78	I-9817
19		Caroline Hunt Trust Estate	3-1-78	I-9873
20		Caroline Hunt Trust Estate	3-1-78	I-9873
21		Caroline Hunt Trust Estate	3-1-78	I-9873
22		Caroline Hunt Trust Estate	3-1-78	I-9873
24		LaMar Hunt	3-1-78	I-9876
25		LaMar Hunt	3-1-78	I-9876
26		LaMar Hunt	3-1-78	I-9876
27		Nelson B. Hunt	3-1-78	I-9861
28		Caroline Hunt Trust Estate	3-1-78	I-9873
29		Nelson B. Hunt	3-1-78	I-9861
30		Nelson B. Hunt	3-1-78	I-9861
31		Nancy B. Hunt	3-1-78	I-9838
32	Nancy B. Hunt	3-1-78	I-9838	
33	Nelson B. Hunt	3-1-78	I-9861	
34	LaMar Hunt	3-1-78	I-9876	
35	Nelson B. Hunt	3-1-78	I-9862	
T. 4 S. R. 1 W. 1	24	Gerald G. Loucks	7-1-75	I-8989
	25	Gerald G. Loucks	7-1-75	I-8989
	34	Gerald G. Loucks	7-1-75	I-8989
	35	Gerald G. Loucks	7-1-75	I-8989

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 4 S. R. 1 E.	KGRA 19	Russell A. Pomeroy	1-1-76	I-10079
	KGRA 20	Russell A. Pomeroy	1-1-76	I-10079
	KGRA 21	Russell A. Pomeroy	1-1-76	I-10079
	KGRA 28	Russell A. Pomeroy	1-1-76	I-10079
	KGRA 29	Russell A. Pomeroy	1-1-76	I-10079
		Geothermal Resources International, Inc.	1-12-75	I-10082
		Geothermal Resources International, Inc.	1-12-75	I-10082
		Geothermal Resources International, Inc.	1-12-75	I-10082
		Geothermal Resources International, Inc.	1-12-75	I-10082
		Occidental Geothermal, Inc. and Louisiana Land & Exploration	1-1-76	I-10080
T. 4 S. R. 8 E.	KGRA 1	Magma Energy Inc. and Union Oil Co. of CA	1-1-78	I-14167
	KGRA 2	Magma Energy Inc. and Union Oil Co. of CA	1-1-78	I-14167
	KGRA 3	Magma Energy Inc. and Union Oil Co. of CA	1-1-78	I-14167
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14208
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14208
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14208
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14208
		Magma Energy Inc. and Union Oil Co. of CA	8-1-75	I-7727
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214
		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214

TABLE 4,6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 4 S. R. 8 E. (Cont'd.)	20	Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14214
	22	Magma Energy Inc. and Union Oil Co. of CA	8-1-75	I-7727
	27	Magma Energy Inc. and Union Oil Co. of CA	8-1-75	I-7727
	29	Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14211
	30	Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14211
	34	Magma Energy Inc. and Union Oil Co. of CA	8-1-75	I-7727
	T. 4 S. R. 9 E.	1	Jerome P. McHugh	5-1-76
2		Jerome P. McHugh	5-1-76	I-8034
4		Magma Energy Inc. and Union Oil Co. of CA	6-1-76	I-7834
5		Magma Energy Inc. and Union Oil Co. of CA	6-1-76	I-7834
6		Magma Energy Inc. and Union Oil Co. of CA	1-1-78	I-14168
KGRA				
7		Magma Energy Inc. and Union Oil Co. of CA	1-1-78	I-14168
KGRA				
8		Magma Energy Inc. and Union Oil Co. of CA	1-1-78	I-14168
KGRA				
9		Magma Energy Inc. and Union Oil Co. of CA	1-1-78	I-14168
KGRA				
10		Jerome P. McHugh	5-1-76	I-8034
11		Jerome P. McHugh	5-1-76	I-8034
12		Jerome P. McHugh	5-1-76	I-8034
14		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14212
15		Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14212
KGRA				
17	Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14168	

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 4 S. R. 9 E. (Cont'd.)	18	Magma Energy Inc. and Union Oil Co. of CA	8-1-78	I-14168
	19	KGRA	8-1-78	I-14168
		KGRA		
	20	KGRA	8-1-78	I-14168
		KGRA		
	21	KGRA	8-1-78	I-14168
		KGRA		
	22	KGRA	8-1-78	I-14212
		KGRA		
	23	KGRA	8-1-78	I-14212
		KGRA		
	26	KGRA	8-1-78	I-14210
		KGRA		
	27	KGRA	8-1-78	I-14210
		KGRA		
31	KGRA	8-1-75	I-7727	
	KGRA			
32	KGRA	8-1-75	I-7727	
	KGRA			
33	KGRA	1-1-78	I-14169	
	KGRA			
34	KGRA	8-1-78	I-14210	
	KGRA			
35	KGRA	8-1-78	I-14210	
	KGRA			
T. 4 S. R. 18 E.	1	Nelson B. Hunt	3-1-78	I-9862
	2	W. H. Hunt	3-1-78	I-9848
	3	Nelson B. Hunt	3-1-78	I-9862
	5	Caroline L. Hunt	3-1-78	I-9870
	6	Caroline L. Hunt	3-1-78	I-9870
	7	Caroline L. Hunt	3-1-78	I-9870
	8	Caroline L. Hunt	3-1-78	I-9870
	9	Nancy B. Hunt	3-1-78	I-9839
		Nancy B. Hunt		

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.	
T. 4 S. R. 18 E. (Cont'd.)	10	Nancy B. Hunt	3-1-78	I-9839	
	11	W. H. Hunt	3-1-78	I-9848	
	12	Nelson B. Hunt	3-1-78	I-9862	
	13	Nelson B. Hunt	3-1-78	I-9848	
	14	W. H. Hunt	3-1-78	I-9848	
	15	W. H. Hunt	3-1-78	I-9839	
	17	Nancy B. Hunt	3-1-78	I-9839	
	18	Nancy B. Hunt	3-1-78	I-9839	
T. 5 S. R. 1 W.	1	Gerald G. Loucks	7-1-75	I-8984	
	2	Gerald G. Loucks	7-1-75	I-8984	
	3	Gerald G. Loucks	7-1-75	I-8984	
	4	Gerald B. Loucks	7-1-75	I-8984	
	9	Gerald Loucks	7-1-75	I-8988	
	10	Gerald Loucks	7-1-75	I-8988	
	11	Gerald Loucks	7-1-75	I-8988	
	12	Gerald Loucks	7-1-75	I-8988	
	13	Laura T. Spangler	5-1-77	I-12776	
	14	Laura J. Spangler	5-1-77	I-12776	
	15	Laura J. Spangler	5-1-77	I-12776	
	22	Laura J. Spangler	5-1-77	I-12775	
	23	Laura J. Spangler	5-1-77	I-12775	
	24	Laura J. Spangler	5-1-77	I-12776	
	25	Laura J. Spangler	5-1-77	I-12775	
	26	Laura J. Spangler	5-1-77	I-12775	
	T. 5 S. R. 1 E.	1	Occidental Geothermal, Inc. and Louisiana Land & Exploration Co.	1-1-76	I-10080
		2	Occidental Geothermal, Inc. and Louisiana Land & Exploration Co.	1-1-76	I-10080
3		Geothermal Resources International, Inc. 12-1-75	12-1-75	I-10082	
4		Occidental Geothermal, Inc. and Louisiana Land & Exploration Co. 1-1-76	1-1-76	I-10080	
		Geothermal Resources International, Inc. 12-1-75	12-1-75	I-10082	

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.	
T. 5 S. R. 1 E. (Cont'd.)	5	Dow Chemical, USA	8-1-75	I-8344	
	6	Laura J. Spangler	5-1-77	I-12774	
	7	Laura J. Spangler	5-1-77	I-12774	
	8	Laura J. Spangler	5-1-77	I-12774	
	KGRA	10	Occidental Geothermal, Inc. and Louisiana Land & Exploration Co.	1-1-76	I-10080
		11	Occidental Geothermal, Inc. and Louisiana Land & Exploration Co.	1-1-76	I-10080
	KGRA	12	Occidental Geothermal, Inc. and Louisiana Land & Exploration Co.	1-1-76	I-10083
		13	Occidental Geothermal, Inc. and Louisiana Land & Exploration Co.	1-1-76	I-10083
	KGRA	14	Occidental Geothermal, Inc. and Louisiana Land & Exploration Co.	1-1-76	I-10083
		17	Laura J. Spangler	3-1-77	I-12769
	KGRA	18	Laura J. Spangler	3-1-77	I-12769
		19	Laura J. Spangler	3-1-77	I-12769
	KGRA	20	Dow Chemical, USA	8-1-75	I-8341
		23	Phillips Petroleum Co.	1-1-76	I-10085
	KGRA	24	Phillips Petroleum Co.	1-1-76	I-10085
		25	Phillips Petroleum Co.	1-1-76	I-10085
	KGRA	26	Phillips Petroleum Co.	1-1-76	I-10085
		27	Dow Chemical, USA	8-1-75	I-8346
	KGRA	30	Laura J. Spangler	3-1-77	I-12770
		31	Laura J. Spangler	3-1-77	I-12770
	KGRA	32	Gerald G. Loucks	8-1-75	I-8990
		33	Gerald G. Loucks	8-1-75	I-8990
	KGRA	34	Gerald G. Loucks	8-1-75	I-8990
		35	Gerald G. Loucks	8-1-75	I-8990

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.	
T. 5 S. R. 2 E.	7	Occidental Geothermal, Inc.	1-1-76	I-10081	
	8	Occidental Geothermal, Inc.	1-1-76	I-10081	
	17	Occidental Geothermal, Inc.	1-1-76	I-10081	
	18	Occidental Geothermal, Inc.	1-1-76	I-10081	
	19	Phillips Petroleum Co.	1-1-76	I-10086	
	20	Phillips Petroleum Co.	1-1-76	I-10086	
	21	Laura J. Spangler	5-1-77	I-12298	
	22	Laura J. Spangler	5-1-77	I-12298	
	26	Laura J. Spangler	5-1-77	I-12298	
	27	Laura J. Spangler	5-1-77	I-12298	
	28	Laura J. Spangler	5-1-77	I-12298	
	29	Phillips Petroleum Co.	1-1-76	I-10086	
	30	Phillips Petroleum Co.	1-1-76	I-10086	
	31	Gerald G. Loucks	7-1-75	I-8983	
	32	Gerald G. Loucks	8-1-75	I-8991	
T. 5 S. R. 8 E.	34	Earth Power Corp.	6-1-77	I-8780	
	35	Earth Power Corp.	11-1-75	I-8049	
	1	Magma Energy and Union Oil of California	8-1-78	I-14213	
	2	Magma Energy and Union Oil of California	8-1-78	I-14211	
	3	Magma Energy and Union Oil of California	8-1-78	I-14211	
	T. 5 S. R. 9 E.	2	Magma Energy and Union Oil of California	8-1-78	I-14209
		3	Magma Energy and Union Oil of California	8-1-78	I-14209
		4	Magma Energy and Union Oil of California	8-1-78	I-14213
		5	Magma Energy and Union Oil of California	8-1-78	I-14213
		6	Magma Energy and Union Oil of California	8-1-78	I-14213
		9	Magma Energy and Union Oil of California	8-1-78	I-14213
10		Magma Energy and Union Oil of California	8-1-78	I-14209	
11		Magma Energy and Union Oil of California	8-1-78	I-14209	

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.	
T. 6 S. R. 1 E.	1	United States Geothermal	7-1-77	I-12328	
	2	United States Geothermal	7-1-77	I-12328	
	3	United States Geothermal	7-1-77	I-12328	
	4	Thermal Resources	7-1-77	I-12687	
	11	United States Geothermal Corp.	7-1-77	I-12329	
	12	United States Geothermal Corp.	7-1-77	I-12329	
	13	Thermal Resources	7-1-77	I-12687	
	14	Thermal Resources	7-1-77	I-12687	
	24	Thermal Resources	7-1-77	I-12685	
	T. 6 S. R. 2 E.	1	Earth Power Corp.	8-1-75	I-8045
		2	Earth Power Corp.	8-1-75	I-8047
		3	Earth Power Corp.	6-1-77	I-7995
		4	Gerald G. Loucks	8-1-75	I-8991
		5	Gerald G. Loucks	7-1-75	I-8983
6		Gerald G. Loucks	7-1-75	I-8983	
7		United States Geothermal	7-1-77	I-12329	
8		United States Geothermal	7-1-77	I-12330	
9		United States Geothermal	7-1-77	I-12330	
10		United States Geothermal	7-1-77	I-12330	
11		Earth Power Corp.	6-1-77	I-7992	
12		Earth Power Corp.	8-1-75	I-8047	
13		Thermal Resources, Inc.	1-1-77	I-10408	
14		United States Geothermal	7-1-77	I-12330	
15		United States Geothermal	7-1-77	I-12331	
17		United States Geothermal	7-1-77	I-12331	
18		United States Geothermal	7-1-77	I-12329	
19		Thermal Resources	7-1-77	I-12685	
20		United States Geothermal	7-1-77	I-12331	
21		United States Geothermal	7-1-77	I-12331	
22		United States Geothermal	7-1-77	I-12331	
23	United States Geothermal	7-1-77	I-12332		
24	Thermal Resources, Inc.	7-1-77	I-12332		
25	Thermal Resources, Inc.	1-1-77	I-10408		
26	United States Geothermal	1-1-77	I-10408		
27	United States Geothermal	7-1-77	I-12332		
28	United States Geothermal	7-1-77	I-12333		
33	United States Geothermal	7-1-77	I-12333		
34	Earth Power Corp.	9-1-77	I-12996		
35	United States Geothermal	7-1-77	I-12333		
		United States Geothermal	7-1-77	I-12332	

TABLE 4,6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.	
T. 6 S. R. 3 E.	1	Earth Power Corp.	8-1-75	I-8046	
	2	Union Oil Co. of California	7-1-75	I-7808	
	5	Earth Power Corp.	8-1-75	I-8045	
	6	Earth Power Corp.	6-1-77	I-8780	
	7	Earth Power Corp.	8-1-75	I-8047	
	8	Earth Power Corp.	11-1-75	I-8049	
	9	Union Oil Co. of California	7-1-75	I-7808	
	10	Union Oil Co. of California	7-1-75	I-7808	
	14	Earth Power Corp.	8-1-75	I-8046	
	15	Earth Power Corp.	8-1-75	I-8047	
	17	Earth Power Corp.	8-1-75	I-8046	
	18	Earth Power Corp.	8-1-75	I-8046	
	19	Thermal Resources, Inc.	8-1-75	I-8046	
	20	Thermal Resources, Inc.	6-1-77	I-10409	
	21	Thermal Resources, Inc.	6-1-77	I-10409	
	22	Thermal Resources, Inc.	6-1-77	I-10411	
	25	Thermal Resources, Inc.	6-1-77	I-10410	
	26	Laura J. Spangler	6-1-77	I-12771	
	27	Laura J. Spangler	6-1-77	I-12771	
	28	United States Geothermal	7-1-77	I-12334	
	29	Thermal Resources, Inc.	6-1-77	I-10410	
	30	Thermal Resources, Inc.	6-1-77	I-10410	
	31	Thermal Resources, Inc.	6-1-77	I-10411	
	32	Thermal Resources, Inc.	6-1-77	I-10410	
	33	Thermal Resources, Inc.	6-1-77	I-10409	
	34	Laura J. Spangler	6-1-77	I-10411	
	35	Snake River Geothermal	6-1-77	I-12771	
	T. 6 S. R. 4 E.	25	Snake River Geothermal	10-1-77	I-13212
		25	Dow Chemical, U.S.A.	8-1-75	I-8348
		26	Dow Chemical, U.S.A.	8-1-75	I-8348
		27	Dow Chemical, U.S.A.	8-1-75	I-8339
		34	Dow Chemical, U.S.A.	8-1-75	I-8348
	35	Dow Chemical, U.S.A.	8-1-75	I-8348	

TABLE 4,6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.	
T. 6 S. R. 5 E.	1	Robert W. Smith	9-1-77	I-12848	
	2	Idaho Geothermal Co.	6-1-76	I-8044	
	3	Idaho Geothermal Co.	6-1-76	I-8044	
	4	Idaho Geothermal Co.	6-1-76	I-8044	
	5	Robert W. Smith	9-1-77	I-12848	
	6	Idaho Geothermal Co.	6-1-76	I-8044	
	7	Idaho Geothermal Co.	6-1-76	I-8044	
	8	Idaho Geothermal Co.	6-1-76	I-8044	
	9	Idaho Geothermal Co.	6-1-76	I-8044	
	10	Robert W. Smith	9-1-77	I-12848	
	11	Robert W. Smith	9-1-77	I-12848	
	12	Idaho Geothermal Co.	1-1-77	I-9887	
	13	Thermal Resources, Inc.	11-1-75	I-7643	
	14	Thermal Resources, Inc.	11-1-75	I-7643	
	24	Robert W. Smith	9-1-77	I-12848	
	30	Idaho Geothermal Co.	6-1-76	I-8044	
	33	Thermal Resources, Inc.	11-1-75	I-7595	
	34	Robert W. Smith	6-1-77	I-12849	
	T. 6 S. R. 6 E.	6	Robert W. Smith	9-1-77	I-12848
		7	Idaho Geothermal	1-1-77	I-9887
		8	Idaho Geothermal	1-1-77	I-9887
		9	Idaho Geothermal	1-1-77	I-9887
		10	Robert W. Smith	9-1-77	I-12847
		15	Robert W. Smith	9-1-77	I-12847
		17	Earth Power Corp.	11-1-75	I-7688
		18	Earth Power Corp.	11-1-75	I-7688
		19	Earth Power Corp.	11-1-75	I-7688
		20	Earth Power Corp.	11-1-75	I-7688
		21	Idaho Geothermal Co.	8-1-75	I-7793
		22	Idaho Geothermal Co.	8-1-75	I-7793
		25	Earth Power Corp.	11-1-75	I-7670
		26	Earth Power Corp.	11-1-75	I-7670
		27	Idaho Geothermal Co.	8-1-75	I-7793
		28	Idaho Geothermal Co.	8-1-75	I-7793
29		Robert W. Smith	9-1-77	I-12847	
30		Idaho Geothermal Co.	1-1-77	I-9887	
33		Robert W. Smith	9-1-77	I-12847	
35		Earth Power Corp.	11-1-75	I-7670	

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.	
T. 7 S. R. 2 E.	1	Gerald G. Loucks	7-1-75	I-8027	
	2	Earth Power Corp.	9-1-77	I-12996	
	3	Earth Power Corp.	9-1-77	I-12996	
	4	Earth Power Corp.	9-1-77	I-12996	
	11	Gerald G. Loucks	7-1-75	I-8026	
	12	Gerald G. Loucks	7-1-75	I-8027	
	13	Gerald G. Loucks	7-1-75	I-8026	
	17	Phillips Petroleum Co.	6-1-78	I-13443	
	20	Phillips Petroleum Co.	6-1-78	I-13443	
	21	Phillips Petroleum Co.	6-1-78	I-13443	
	T. 7 S. R. 3 E.	1	United States Geothermal	7-1-77	I-12335
		2	United States Geothermal	7-1-77	I-12336
		3	United States Geothermal	7-1-77	I-12335
		4	United States Geothermal	7-1-77	I-12334
		5	Gerald G. Loucks	7-1-75	I-8028
		6	Gerald G. Loucks	7-1-75	I-8028
		7	Gerald G. Loucks	7-1-75	I-8028
		8	Gerald G. Loucks	7-1-75	I-8027
		9	Thermal Resources	7-1-77	I-12684
		10	Earth Power Co.	9-1-77	I-12995
		11	United States Geothermal	7-1-77	I-12336
12		United States Geothermal	7-1-77	I-12335	
13		Thermal Resources	7-1-77	I-12688	
14		Earth Power Co.	9-1-77	I-12995	
15		Earth Power Co.	9-1-77	I-12995	
17		Gerald G. Loucks	7-1-75	I-8027	
18		Gerald G. Loucks	7-1-75	I-8028	
23		Snake River Geothermal	10-1-77	I-13212	
26		Thermal Resources	7-1-77	I-12684	
T. 7 S. R. 4 E.		1	Dow Chemical, U.S.A.	8-1-75	I-8339
		3	Dow Chemical, U.S.A.	8-1-75	I-8348
		4	Dwayne C. Spangler	5-1-77	I-12778
		5	Dwayne C. Spangler	5-1-77	I-12778
		6	Dwayne C. Spangler	5-1-77	I-12778
		6	Dwayne C. Spangler	5-1-77	I-12778
		7	United States Geothermal	7-1-77	I-12335

TABLE 4,6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 7 S. R. 4 E. (Cont'd.)	8	Snake River Geothermal Co.	10-1-77	I-13212
	9	Snake River Geothermal Co.	10-1-77	I-13210
	10	Dow Chemical, U.S.A.	8-1-75	I-8339
	11	Dow Chemical, U.S.A.	8-1-75	I-8339
	13	Russell A. Pomeroy	11-1-75	I-8019
	14	Dow Chemical, U.S.A.	8-1-75	I-8339
	15	Dow Chemical, U.S.A.	8-1-75	I-8339
	17	Snake River Geothermal Co.	10-1-77	I-13212
	18	Snake River Geothermal	10-1-77	I-13210
	19	Thermal Resources	7-1-77	I-12688
	20	Thermal Resources	7-1-77	I-12684
	21	Snake River Geothermal	10-1-77	I-13210
	22	Snake River Geothermal Co.	10-1-77	I-13209
	23	Dow Chemical, U.S.A.	8-1-75	I-8339
	25	Russell A. Pomeroy	11-1-75	I-8019
	26	Snake River Geothermal	10-1-77	I-13209
	27	Snake River Geothermal	10-1-77	I-13209
	34	Snake River Geothermal	10-1-77	I-13209
	35	Snake River Geothermal	10-1-77	I-13209
	T. 7 S. R. 5 E.	1	Idaho Geothermal Co.	1-1-77
2		Robert W. Smith	6-1-77	I-12849
3		Thermal Resources, Inc.	11-1-75	I-7595
4		Thermal Resources, Inc.	11-1-75	I-7595
5		Robert W. Smith	6-1-77	I-12849
6		Dow Chemical, U.S.A.	8-1-75	I-8339
8		Thermal Resources, Inc.	11-1-75	I-7595
9		Thermal Resources, Inc.	11-1-75	I-7595
10		Idaho Geothermal Co.	1-1-77	I-9886
11		Idaho Geothermal Co.	11-1-75	I-7696
12		Idaho Geothermal Co.	1-1-77	I-9886
13		Robert W. Smith	6-1-77	I-12849
14		Robert W. Smith	6-1-77	I-12849
15		Idaho Geothermal Corp.	8-1-75	I-7665
17		Thermal Resources, Inc.	11-1-75	I-7776
18		Dow Chemical, U.S.A.	8-1-75	I-8339
19		Russell H. Pomeroy	11-1-75	I-8020

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 7 S. R. 5 E.	20	Thermal Resources, Inc.	11-1-75	I-7776
	21	Thermal Resources, Inc.	11-1-75	I-7776
	22	Thermal Resources, Inc.	11-1-75	I-7776
	23	Idaho Geothermal Corp.	8-1-75	I-7665
	24	Idaho Geothermal Corp.	8-1-75	I-7665
	25	United States Geothermal	7-1-77	I-12338
	26	United States Geothermal	7-1-77	I-12338
	27	Snake River Geothermal Co.	10-1-77	I-13208
	28	Russell A. Pomeroy	11-1-75	I-8020
	29	Russell A. Pomeroy	11-1-75	I-8020
	30	Russell A. Pomeroy	11-1-75	I-8020
	31	Russell A. Pomeroy	11-1-75	I-8019
	32	Russell A. Pomeroy	11-1-75	I-8019
	33	Russell A. Pomeroy	11-1-75	I-8019
	34	Russell A. Pomeroy	11-1-75	I-8019
	35	Snake River Geothermal Co.	10-1-77	I-13208
	T. 7 S. R. 6 E.	1	Robert W. Smith	6-1-77
2		Earth Power Corp.	11-1-75	I-7670
3		Idaho Geothermal Co.	12-1-76	I-10073
4		Idaho Geothermal Co.	12-1-76	I-10073
6		Idaho Geothermal Co.	11-1-75	I-7674
7		Idaho Geothermal Co.	11-1-75	I-7674
8		Idaho Geothermal Co.	11-1-75	I-7674
10		Idaho Geothermal Co.	12-1-76	I-10073
11		Idaho Geothermal Co.	12-1-76	I-10073
12		Robert W. Smith	12-1-76	I-12850
13		Robert W. Smith	6-1-77	I-12850
14		OXY Petroleum and Louisiana Land & Exp. Co.	6-1-77	I-12850
15		OXY Petroleum and Louisiana Land & Exp. Co.	8-1-75	I-9545
17		Louisiana Land & Exp. Co.	8-1-75	I-9545
18		Idaho Geothermal Co.	11-1-75	I-7674
19		Idaho Geothermal Co.	11-1-75	I-7674
20		Idaho Geothermal Co.	11-1-75	I-7846
		Idaho Geothermal Co.	11-1-75	I-7846

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TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 7 S. R. 6 E. (Cont'd.)	21	OXY Petroleum and Louisiana Land & Exploration Co.	8-1-75	I-9546
	23	OXY Petroleum and	8-1-75	I-9545
		Louisiana Land & Exploration Co.	8-1-75	I-9545
	24	Louisiana Land & Exploration Co.	12-1-76	I-10075
	25	Idaho Geothermal Co.	6-1-77	I-12850
	26	Robert W. Smith	8-1-75	I-9545
		OXY Petroleum and	8-1-75	I-9545
	27	Louisiana Land & Exploration Co.	8-1-75	I-9546
		OXY Petroleum and	8-1-75	I-9546
	28	Louisiana Land & Exploration Co.	8-1-75	I-9546
	29	OXY Petroleum and	11-1-75	I-7846
	30	Louisiana Land & Exploration Co.	11-1-75	I-7846
	31	Idaho Geothermal Co.	12-1-76	I-10075
	32	Idaho Geothermal Co.	12-1-76	I-10075
	33	Idaho Geothermal Co.	8-1-75	I-7629
34	Idaho Geothermal Co.	8-1-75	I-7629	
35	Idaho Geothermal Co.	12-1-76	I-10076	
T. 8 S. R. 5 E.	1	Snake River Geothermal Co.	10-1-77	I-13211
	2	Snake River Geothermal Co.	10-1-77	I-13208
	3	Snake River Geothermal Co.	10-1-77	I-13208
	6	Amax Exploration, Inc.	7-1-78	I-13324
	7	Amax Exploration, Inc.	7-1-78	I-13323
	10	Snake River Geothermal.	10-1-77	I-13211
	11	Snake River Geothermal	10-1-77	I-13211
	12	Snake River Geothermal	10-1-77	I-13211
	15	Snake River Geothermal	10-1-77	I-13211
	20	Amax Exploration, Inc.	7-1-78	I-13321
	22	Amax Exploration, Inc.	7-1-78	I-13321
	23	Amax Exploration, Inc.	7-1-78	I-13324
	24	Amax Exploration, Inc.	7-1-78	I-13323
	26	Amax Exploration, Inc.	7-1-78	I-13324
	28	Amax Exploration, Inc.	7-1-78	I-13321
33	Amax Exploration, Inc.	7-1-78	I-13323	
34	Amax Exploration, Inc.	7-1-78	I-13321	
35	Amax Exploration, Inc.	7-1-78	I-13324	
		Amax Exploration, Inc.	7-1-78	I-13323

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.	
T. 8 S. R. 6 E.	1	Atlantic Richfield Co.	7-1-75	I-8996	
	2	Atlantic Richfield Co.	7-1-75	I-8993	
	3	Atlantic Richfield Co.	7-1-75	I-8997	
	4	Atlantic Richfield Co.	7-1-75	I-8994	
	5	Atlantic Richfield Co.	7-1-75	I-8998	
	6	Atlantic Richfield Co.	7-1-75	I-8998	
	7	Atlantic Richfield Co.	7-1-75	I-8998	
	8	Atlantic Richfield Co.	7-1-75	I-8998	
	9	Atlantic Richfield Co.	7-1-75	I-8994	
	10	Atlantic Richfield Co.	7-1-75	I-8997	
	11	Atlantic Richfield Co.	7-1-75	I-8993	
	12	Atlantic Richfield Co.	7-1-75	I-8996	
	13	Atlantic Richfield Co.	7-1-75	I-8996	
	14	Atlantic Richfield Co.	7-1-75	I-8993	
	15	Atlantic Richfield Co.	7-1-75	I-8997	
	21	Atlantic Richfield Co.	7-1-75	I-8994	
	22	Atlantic Richfield Co.	7-1-75	I-8997	
	23	Atlantic Richfield Co.	7-1-75	I-8993	
	24	Atlantic Richfield Co.	7-1-75	I-8996	
	26	Atlantic Richfield Co.	7-1-75	I-8995	
	27	Atlantic Richfield Co.	7-1-75	I-8995	
	28	Atlantic Richfield Co.	7-1-75	I-8994	
	34	Atlantic Richfield Co.	7-1-75	I-8995	
	35	Atlantic Richfield Co.	7-1-75	I-8995	
	T. 13 S. R. 26 E.	25	Sunoco Energy Development Co.	5-1-76	I-7720
	T. 13 S. R. 27 E.	25	Sunoco Energy Development Co.	7-1-75	I-7781
		26	Sunoco Energy Development Co.	7-1-75	I-7781
		35	Sunoco Energy Development Co.	7-1-75	I-7781
	T. 14 S. R. 26 E.	1	Phillips Petroleum Co.	7-1-78	I-7792
		2	Phillips Petroleum Co.	7-1-78	I-7792
		11	Phillips Petroleum Co.	7-1-78	I-7792
		31	Sunoco Energy Development Co.	12-1-76	I-7633
		32	Sunoco Energy Development Co.	12-1-76	I-7633

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 14 S. R. 27 E.	21	Sunoco Energy Development Co.	8-1-75	I-7702
	25	Sunoco Energy Development Co.	7-1-75	I-7617
	26	Sunoco Energy		
	28	Sunoco Energy Development Co.	8-1-75	I-7702
	35	Sunoco Energy Development Co.	7-1-75	I-7802
T. 15 S. R. 26 E.	5	Sunoco Energy Development Co.	12-1-76	I-7633
	15	Raft River Rural Electric Coop	5-1-78	I-14166
	16	Raft River Rural Electric Coop	5-1-78	I-14166
	20	Sunoco Energy Development Co.	2-1-78	I-7634
	21	Raft River Rural Electric Coop	5-1-78	I-14166
	21	Sunoco Energy Development Co.	2-1-78	I-7634
	22	Raft River Rural Electric Coop	5-1-78	I-14166
	28	Raft River Rural Electric Coop	5-1-78	I-14166
	29	Raft River Rural Electric Coop	5-1-78	I-14166
	29	Sunoco Energy Development Co.	2-1-78	I-7634
T. 15 S. R. 27 E.	15	L.H. Armour, Sr.	9-1-76	I-7673
	20	L.H. Armour, Jr.	9-1-76	I-7673
	27	L.H. Armour, Jr.	9-1-76	I-7673
	35	Sunoco Energy Development Co.	7-1-75	I-7844
T. 16 S. R. 26 E.	3	Sunoco Energy Development Co.	10-1-77	I-7710
	8	Sunoco Energy Development Co.	12-1-76	I-7660
	9	Sunoco Energy Development Co.	12-1-76	I-7660
	10	Sunoco Energy Development Co.	10-1-77	I-7710
	15	Sunoco Energy Development Co.	10-1-77	I-7710
	17	Sunoco Energy Development Co.	12-1-76	I-7660
	20	Sunoco Energy Development Co.	12-1-76	I-7660
T. 16 S. R. 27 E.	1	Sunoco Energy Development Co.	7-1-75	I-7844
	2	Sunoco Energy Development Co.	7-1-75	I-7844
	5	Sunoco Energy Development Co.	9-1-76	I-9376
	6	Sunoco Energy Development Co.	9-1-76	I-9376
	7	Sunoco Energy Development Co.	9-1-76	I-9376
	8	Sunoco Energy Development Co.	9-1-76	I-9376
	11	Sunoco Energy Development Co.	7-1-75	I-7844
	18	Sunoco Energy Development Co.	9-1-76	I-9376

TABLE 4.6 - Continued

Location	Section	Lessee	Date Issued	Serial Register No.
T. 16 S. R 28 E.	5	Sunoco Energy Development Co.	9-1-76	I-9377
	7	Sunoco Energy Development Co.	9-1-76	I-9377

5.0 Oil and Gas Exploration in Idaho

Oil and gas exploration drilling activity within the State of Idaho is summarized in the following tables. The information comes from the oil and gas drilling activity register kept by the Idaho Department of Lands, which is available for public inspection at the Department of Lands, Statehouse, Boise, during regular business hours.

For the purpose of this report, the State has been arbitrarily divided into eastern and western portions at the R20E-R21E (B.M.) interface. Within this broader division, data is tabled primarily north to south by Township, and secondarily west to east by Range, and finally Section and Sub-section. The information provided, in addition to location (Section, township and range), gives the name of the principal that drilled the well, well name, date of drilling, total depth drilled (or projected), whether or not logs have been recorded with the Department of Lands and what type, the county in which the drilling occurred, and any further remarks on well status. Table 5.1 lists the oil and gas exploration wells in western Idaho. Table 5.2 lists the oil and gas exploration wells in eastern Idaho.

For further specific information on drilling activity and/or individual wells, inquiry should be addressed to the Idaho Department of Lands, or the principal well driller as listed in the table.

Since 1928, approximately 114 oil and gas exploration wells have been permitted by the State of Idaho. In order to compare the level of exploration activity for oil and gas with geothermal resource exploration, only these oil and gas wells drilled since the passage of the Idaho Geothermal Resources Act of 1972 were inventoried. Since 1972, the Idaho Department of Lands has issued twenty (20) oil and gas exploration permits. This is compared to fifteen (15) geothermal resource permits which have been issued by the Idaho Department of Water Resources during the same period. Eight oil and gas exploration permits have been issued since 1978 which reflects the increasing exploration interest in the Overthrust Belt in southeastern Idaho.

TABLE 5.1

OIL AND GAS EXPLORATION WELLS IN WESTERN IDAHO
(WEST OF R.21E., B.M.)

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T52N R4W	31	Coeur d'Alene Oil & Development		1928		No	Kootenai	Abandoned.
T51N R4W	1	Coeur d'Alene Oil & Development		1929	1980+	Yes	Kootenai	Abandoned.
T11N R5W	15	Oroco Oil & Gas	T. B. Carr	1955	2320	Yes	Washing- ton	Abandoned.
T11N R5W	32	Bradshaw et. al.		1929	1165	No	Washing- ton	Abandoned.
T11N R4W	12	Echo Dell Inc. Rt. 2-Box 90 Weiser, ID 83672	Graham #1 Fee				Washing- ton	Not drilled.
T10N R4W	32	Crystal Dome Oil	Daniel #1	1929- 1930	1516	No	Washing- ton	Abandoned.
T10N R4W	32	Crystal Dome Oil & Gas and Mt. States Oil & Gas	Daniel #2	1930	1860	Yes	Washing- ton	Gas at 1410- 1775; gas flow at 1860.
T10N R4W	32	The Bankers Petroleum	Government	1953		No	Washing- ton	
T10N R4W	32	Mt. States Oil & Gas	Freeman #1	1953	1865	No	Washing- ton	Abandoned.

TABLE 5.1 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T10N R3W	13	Boise Petroleum Company		1931	1010	Yes	Washington	Abandoned.
T9N R5W	33	Idaho-Oregon Petroleum International Finance	Idaho Can-ning	1928	1730	Yes	Payette	Abandoned.
T9N R5W	33	Taylor et. al.	Idaho Can-ning	1928	1500-2000	No	Payette	Abandoned; reported strong gas flow for 25 min.; self sealing.
T9N R5W	33	Idaho-Oregon Petroleum	Idaho Can-ning	1935	2500	No	Payette	Some gas at 1270'.
T9N R4W	5	Ohio Oil Co.	Kramlich-1	1931	4011	Yes	Payette	Abandoned.
T9N R3W	8	E1 Paso Natural Gas	Asmussen #1	1956	4017	Yes	Payette	Plugged and abandoned.
T8N R5W	2	Consolidated Oil		1928		No	Payette	Abandoned.
T8N R5W	4	Oroco Oil & Gas Simplot	Betty Carpenter	2-55 to 3-55	2775	Yes	Payette	Abandoned.
T8N R5W	12	Payette Exploration	E. H. Yager	8-35 to 9-35	892	Yes	Payette	Abandoned.

TABLE 5.1 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T8N R4W	27	Oroco Oil & Gas Simplot	Virgil Johnson #1	4-55 to 9-55	4040	Yes	Payette	Abandoned.
T8N R4W	27	El Paso Natural Gas	Virgil Johnson #2	1956	3521	Yes	Payette	Plugged and abandoned.
T8N R4W	34	Oroco Oil & Gas Simplot	Ted Daws	7-55 to 9-55	1685	Yes	Payette	Abandoned.
T8N R3W	9	Std. American Co. Box 5813 Boise, ID 83705	#2	5-75 to 8-75	4855	Sonic-gamma ray Gamma ray neutron induction- elect.	Payette	Plugged and abandoned.
T8N R1W	15	Great Basin Petrol 1011 Gateway West Century City Los Angeles, CA 90067	Little #1	*			Gem	*Permit 6-5-78; not drilled.
T6N R5W	24	Standard Oil of California	Highland Live-stock Co. Well	1972	11963	FDC-CNL-GR oil, BHC w/ CAL, HDT, Lithologic, Arrow plot	Payette	Plugged and abandoned.

TABLE 5.1 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T6N R3W	3	Bergdahl Oil Co.	C. A. Berglund-1	4-28 to 5-28	576	Yes	Gem	Used for artesian water aquifer.
T6N R3W	3	Bergdahl Oil Co.	C. A. Berglund-2	5-28 to 6-28	693	Yes	Gem	Abandoned.
T6N R1W	25	Bergdahl Oil Co.	Aikman-2	8-26 to 6-28	295	No	Gem	Abandoned.
T6N R1W	25	Bergdahl Oil Co.	Aikman-3	1930	600	No	Gem	Abandoned.
T6N R1W	35	Bergdahl Oil Co.	Aikman-1	1926	175	No	Gem	Abandoned.
T5N R4W	9	Oroco Oil & Gas Simplot	Cleveland	1955	4038	Yes	Canyon	Abandoned.
T5N R3W	16	El Paso Natural Gas	Webber State #1	1956	4528	Yes	Canyon	Plugged and abandoned.
T5N R3W	27		O. A. Cox	1912	950	No	Canyon	Gas at 914-950'.
T5N R3W	27	United Utilities	Johnson-1	1931		No	Canyon	Abandoned.
T4N R3W	19	Oroco Oil & Gas Simplot	Richardson	8-55 to 1-56	3048	Yes	Canyon	Abandoned.

TABLE 5.1 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T4N R1W	27	Michel T. Hal- bouty 5100 Westheimer Rd. Houston, TX 77056	J. N. James #1	6-76 to 9-76	14006	Laterolog Induction- electrical cont. dip meter; Sonic log-gamma ray Neutron-for- mation den- sity Mud log	Ada	Plugged and abandoned.
T4N R1E		Scott Anderson Co.	Dry Creek	1927- 1928	1562	Yes	Ada	Abandoned.
T4N R3E	27	Boise Oil Co.	#1	1937- 1939	1625	Yes	Ada	Trace of gas in sandy black shale.
T3N R1W	9	Roden Drilling	#1 Higgensox	1972	3610	No	Ada	Plugged and abandoned.
T2N R3W	19 or 20	United Utili- ties	Armfield-1	1931		No	Canyon	Abandoned.
T3S R6W	23	Pan American Petroleum	R. S. McKnight #1	1960	1182	Yes	Owyhee	Abandoned.
T4S R8E	25	Al Griffith	Bostic #1-A	12-72 to 7-73	9678	Hydrocarbon induction- elect. Latero log	Elmore	Plugged and abandoned.

TABLE 5.1 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T5S R1E	13	Anchute Corp.	#1	5-74	11125	Yes	Owyhee	Plugged and abandoned.
T5S R1E	28		Clinton Basset		500	No	Owyhee	Abandoned.
T5S R3E	7	B. B. & M Oil & Gas	W. I. Turner	1931	1746	No	Owyhee	Data from Boise Statesman 1-4-31
T6S R7E	16	Helmerich & Payne Inc.	State #1	3-50 to 4-50	2653	Yes	Owyhee	Dry hole.
T6S R8E	19	Helmerich & Payne Inc.	Parker #1	1950	3808	Yes	Owyhee	Dry hole.
T7S R9E	16	Helmerich & Payne Inc.	State #2	1950	2068	Yes	Elmore	Abandoned; dry hole.

TABLE 5.2

OIL AND GAS EXPLORATION WELLS IN EASTERN IDAHO
(EAST OF R.20E., B.M.)

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T14N R36E	32	Mondia Oil Co. Fred G. Ostland	Rose #1	1926	1385	No		Abandoned.
T6N R31E	27	U.S.G.S.			774		Butte	USGS; dry water.
T6N R44E	35	Fremont Oil Co.		1903	660	No	Teton	Abandoned.
T5N R44E	26	Am. Quasar Petro. of N.M.	Cook 26-1	10-77 to 2-78	6565	P & A: DL, BHC-sonic, CFD, FDC.CNL, DIL-SFL-E, TL, HRT	Teton	Plugged and abandoned.
T5N R44E	26	Am. Quasar Petro of N.M.	State 26-1				Teton	Permit 3-14-78; not drilled.
T5N R44E	28	Teton Valley L & L Co.	#1	1926	1300	No	Teton	Abandoned.
T5N R44E	28	Teton Valley L & L Co.	Bevan	1926	1392	No	Teton	Abandoned.
T5N R44E	28	Phillips Petrol. Co.	Horshoe #1	9-51 to 3-53	12720	Lithologic	Teton	
T5N R44E	28	Sun Production Co. 2525 N.W. Expwy. Oklahoma City, OK	1-28				Teton	Permit 4-17-78; not drilled.

TABLE 5.2 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T5N R44E	32	Teton Valley L & L Co.		1929	100	No	Teton	Abandoned.
T5N R44E	33	Grand Teton Oil Standard Ex- ploration		1931	3340	No	Teton	Abandoned.
T5N R44E	33	Supron Energy Corp. Bldg. V 5th Fl. 10300 N. Cent- ral Expwy. Dallas, TX 75231	Bevans #1				Teton	Spudded appx. 8-7-79.
T5N R44E	34	Sun Production Co. 2525 N.W. Expwy. Oklahoma City, OK	1-34 IGC	6-78 to 7-78	3715	DIL, BHC- Sonic, CNL- FDC, daily program	Teton	
T5N R45E	9	Cities Service Oil Co.	A#1	9-73 to 1-74	8402	BHL-GR DIL CNL-GR FDC	Teton	Plugged.
T4N R31E	16				475		Butte	USGS; dry water.
T4N R38E	24	Idaho Oil & Mines Corp.	Bullock & Sorenson	1953	455	Yes	Jefferson	Abandoned.

TABLE 5.2 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T3N R29E	14				547		Butte	USGS; dry water.
T3N R30E	12				499		Butte	USGS; dry water.
T3N R32E	29				698		Butte	USGS; dry water.
T3N R41E	33	California Company	Sorensen #1	1928-1930	3774	Yes	Bonneville	Abandoned; showing of asphaltic material reported, not confirmed by log.
T2N R31E	35		Arco I		635	Well log	Bingham	USGS water.
T1N R44E	24	Edwin Allday	#1	9-65 to 2-66	5760	Mud, daily rpt., electric, DST's	Bonneville	Abandoned.
T1S R39E	8	Union Oil Co. of California Box 2620 Casper, WY 82602	Hoff 1-8M	5-79 to 9-79	8936	No	Bingham	
T2S R41E	2	Am. Quasar Petro of N.M. 330 Pacific Western Bldg. Casper, WY 82601	King 2-1	2-78 to 8-78	13555	P&A, FDC-CNL-GR; BHC-GR; DIL-SFL; 1-ESS DLT-GR; Cyberlook; Daily log; Geo Rot; Geo-log; 9 DST's	Bingham	Plugged and abandoned.

TABLE 5.2 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T2S R44E	23	Sun-Sinclair (Sun Oil Co.)	Big Elk Mtn. #1	2-49 to 10-50	5597	Yes	Bonneville	Abandoned; dry hole partly drilled, partly cored, lost mud.
T2S R44E	24	Pan American	T. J. Weber	9-63 to 10-64	9717	Yes	Bonneville	Abandoned.
T3S R45E	36	Am. Quasar Petro of N.M.	#1	8-76 to 2-77	14330	DLL, DIL; BHC-GR, DST (4) H ₂ O Analysis Cement	Bonneville	Plugged and abandoned.
T4S R42E	9	Continental Oil Co. 152 N. Durbin Casper, WY 82601	Gentle Valley #1	9-78 to 12-78	9913	Yes*	Bonneville	*Cyberlook (3), DLL-RXO, DIL (3), FDC/CNL (3), BHC/ GR (4), HDT (4), HRT (3), CDR (2), Cement (1).
T7S R44E	32	Standard Oil of California	Dry Valley	7-52 to 11-52	7868	Hydrocarbon	Caribou	Abandoned.
T7S R46E	34	Wallace Wyoming & Great Western Oil Co.	#1	1926	2448	Hydrocarbon	Caribou	Much salt probably jur- assic.
T9S R30E	35	Rockland Valley Oil		1926	1550	No	Power	Abandoned.
T9S R42E	27		Frazier #1 Ira Ellis	1956	3540	No	Caribou	See AAPG Symposium Vol. I- memoir 15 p. 526-7 O & G shows.

TABLE 5.2 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T10S R33E	35	States Oil Co.	#1	7-69	3680	Yes	Power	Plugged.
T10S R36E	14	Cache Gas & Oil Co.	Ashlette #1	9-58 to 10-58	3003	Hydrocarbon	Bannock	Abandoned.
T10S R37E	19	Norton Oil & Gas	#1	1927	1349	Hydrocarbon	Bannock	Minor gas and oil show.
T10S R37E	19	Norton Oil & Gas	#2		2700	Hydrocarbon	Bannock	Minor gas and oil show.
T10S R43E	13	Union Texas Petroleum 1010 Lincoln Tower Denver, CO 80295	Big Canyon Federal 1-13	9-12-78 to 3-4-79	11734	Yes*	Bear Lake	DIL; FDC/CNL/GR; cyberlook; BHC/GR; GR-Casing Collar; DLL; Log Analysis; hydrocarbon.
T10S R43E	21	Eastern Idaho Development	State	5-56 to 8-56	3900	Hydrocarbon	Bear Lake	Abandoned; dry hole.
T10S R46E	8	May Petroleum Inc. c/o McIlroy-Adams Co. Rm. 103 152 N. Durbin Casper, WY 82601	Federal #1-8	9-77 to 9-78	16750	P&A; BHC-GR; DIL/SFL; HRT; CAL; FDC/CNL; cyberlook; geologic rpt; mud log	Caribou	Plugged and abandoned.

TABLE 5.2 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T10S R46E	20	May Petroleum Inc. One Energy Sq. 4925 Greenville Dallas, TX 75206	Elk Valley #1	7-76 to 8-76	3919	Sonic log- gamma ray Laterolog, micro latero- log, induc- tion-elect. Lithologic log, geolo- gists rpt., temperature log, hydro- carbon, mud log	Caribou	
T10S R46E	28	Amerada Petro- leum	Amerada TL-W1	8-63 to 10-63	4115	Gamma ray- neutron Cont dip meter Sonic log- gamma ray Latero log hydrocarbon	Caribou	Abandoned.
T11S R33E	2	Gem State Petroleum	#1	1926	3855	Yes	Power	Abandoned.
T11S R37E	35	Nuday Explora- tion 420 S. State Preston, ID 83263	Bannock 3A35	*			Bannock	*Permit 6-7-78, not drilled.
T12S R25E	17	Marsh Basin Oil & Gas		1926	600	Yes	Cassia	Abandoned.

TABLE 5.2 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T12S R37E	1	Nuday Exploration 420 S. State Preston, ID 83263	Bannock 2A1	*			Bannock	*Permit 6-7-78, not drilled.
T12S R38E	8	Nuday Exploration 420 S. State Preston, ID 83263	Bannock 1A8	8-78 to 9-78	1840	DIFL BHC Acoustic Densilog	Bannock	
T12S R43E	3	Ladd Petroleum 830 Den. Club Bldg. Denver, CO 80202	Bennington #3-24		Pro. 13500		Bear Lake	App 7-13-79.
T12S R46E	30	Rocky Mtn. Oil Co.	Government	8-53 to 12-54	5013	Hydrocarbon	Bear Lake	Abandoned, dry hole.
T13S R44E	22	Am. Quasar Petroleum 707 United Bank Tower 1200 Broadway Denver, CO 80290	Jensen 22-1	9-77 to 1-78	11780	BHC Sonic comp Neutron FD dual laterolog, TL mud log, survey, 16 DST's, Shale dens	Bear Lake	Plugged and abandoned.

TABLE 5.2 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T13S R46E	29	Cities Service Co. 1600 Broadway Suite 900 Denver, CO 80202	Williams-Rigby "A" #1		Pro. 9800		Bear Lake	App. 9-26-79.
T14S R26E	1	Al Griffith Std. American	Griffith- White #1	9-73 to 12-73	7000 (8000)	No	Cassia	Abandoned, tap- ped hot water.
T14S R30E	10	Phillips Petro. Utah Southern	Juniper #1	2-50 to 2-51	12844	Yes		Abandoned.
T14S R44E	31	J. Holme Danford Gen. Delivery Bloomington, ID 83223	99 x 101	8-76 to 9-76	805	DIFL, GR BHC ALC	Bear Lake	Completion shut-in.
T15S R21E	25	West Pearl Oil & Gas		1926	2823	No	Cassia	Abandoned, artesian water reported.
T15S R22E	30	Goose Creek Oil & Gas		1926	1400	No	Cassia	Abandoned.
T15S R27E	31	Al Griffith Simplot		1974	4000	No	Cassia	Abandoned.
T15S R38E	36	Willet Flying Service	Idaho Willet #1	9-66 to 10-66	4470	Hydrocarbon	Franklin	To be used as water well.

TABLE 5.2 - Continued

TOWNSHIP	SEC.	COMPANY	WELL NAME	DATE	DEPTH	LOGS	COUNTY	REMARKS
T15S R43E	1	J. Holme Danford Gen. Delivery Bloomington, ID 83223	99 x 104	2-77 to 6-77	809	Mud log	Bear Lake	Completion shut-in.
T15S R45E	34	Standard of California	Sheep Creek #1	5-52 to 12-52	6768	Hydrocarbon	Bear Lake	Abandoned, dry hole.
T16S R24E	26	Cougar Mining Co.	Spencer	1926	500	No	Cassia	Abandoned.
T16S R27E	9	Al Griffith Simplot	#1	6-74 to 7-74	4100	Yes	Cassia	Abandoned.
T16S R28E	20	Al Griffith	#1	9-73 to 10-73	6981	Yes	Cassia	Plugged.
T16S R38E	15	Utah-Idaho Ex- ploration Co.	August Jensen #1	1956	5233	Gamma Ray- Neutron Microlatero- log *	Franklin	*Available from Rocky Mtn. Well Log Service, Denver, CO.
T16S R46E	10	Am. Quasar Petro- leum 707 United Bank Tower 1200 Broadway Denver, CO 80290	Grace Federal 10-1	2-78 to 8-78	11860	P&A; FDC-CNL; BHC-GR; DLL; HRT	Bear Lake	Plugged and abandoned.

6.0 Oil and Gas Leasing in Idaho

State and federal oil and gas leasing in the State of Idaho was reviewed to compare the magnitude of geothermal leasing activity with oil and gas leasing. Table 6.1 lists the status of state oil and gas leasing by total acreage held per lessee. Table 6.2 lists the status of federal oil and gas leasing by total acreage held per lessee.

The State of Idaho has issued oil and gas leases for approximately 1,129,059 acres of state mineral lands. Geothermal leasing activity in state lands accounts for 379,603 acres. The large difference in total acreage leased is primarily due to three factors:

- 1) In 1975 the State Land Board declared a moratorium of state geothermal leasing which held the total acreage leased at 59,504 acres.
- 2) The State Land Board lifted its moratorium in January 1979. Approximately 320,099 acres were leased during the initial filing period. Leasing activity is expected to level off after the initial filing period.
- 3) There is a higher degree of speculative oil and gas leasing activity due to the higher pay-back for a discovery.

The Bureau of Land Management has issued oil and gas leases for approximately 3,458,575.86 acres of federal mineral lands. Geothermal leasing activity on federal land accounts for 293,945 acres. The large difference in total acreage leased for oil and gas versus geothermal can be attributed to five primary factors:

- 1) An acreage limitation of 25,000 acres for federal geothermal lease in any one state.
- 2) Institutional delays in processing geothermal leases (See Section 5.0 of this report).
- 3) The economic pay-back in oil and gas exploration justifies large leasing and exploration commitments.
- 4) Geothermal development is an emerging technology which has only recently attained a competitive status.
- 5) Low temperature resources are largely ignored by major exploration companies due to the site specific development nature of such resources.

In general, oil and gas leasing activities on state and federal lands have not experienced the institutional delays and regulatory restrictions which have been identified as barriers to geothermal leasing. Historically, oil and gas exploration has proven to be a good speculative investment which encourages smaller exploration firms to invest in leasing activities. Comparative, geothermal leasing and exploration has been confined to a relatively few major exploration firms and a minor number of smaller firms.

TABLE 6.1

STATE OIL AND GAS LEASE ACREAGE BY LESSEE

<u>Lessee</u>	<u>100 % Ownership Lease Acreage</u>	<u>Joint Ownership Leases</u>	
		<u>% Ownership</u>	<u>Acreage</u>
A. A. Minerals	360		
Allied Chemical	320	75%	3,186.83
American Quasar Petroleum of New Mexico	4,676	50%	44,851.39
		37.5%	27,883.72
Amoco Production Co.	30,963.04		
Donald B. Anderson	14,576		
Ida Lee Anderson	14,366		
Anschutz Co.		50%	65,051.
Arkla Exploration Co.		50%	8,511.68
James H. Ballentyne, Jr.	23,209.97		
Champlin Petroleum Co.	18,703.77		
Chevron USA, Inc.	2,476.06		
Cities Service Co.	55,159	75%	2,306.
Conoco	39,220.55		
Croff Oil Co.	20,193		
Crown Central Petroleum		25%	42,357.
Raymond T. Duncan	2,931		
Vincent J. Duncan	40		
Energy Reserves Group, Ind.		25%	320
Enserch Exploration, Inc.		25%	320
Filon Exploration Corp.		50%	320
Martin Freedman and Robert Haynie	2,483		
General American Oil Co. of Texas	640		
W. A. Gillespie		50%	31,443
W. R. Grace		50%	4,126.51
Great Basins Petroleum Co.	17,190		

TABLE 6.1 - Continued

STATE OIL AND GAS LEASE ACREAGE BY LESSEE

<u>Lessee</u>	<u>100 % Ownership Lease Acreage</u>	<u>Joint Ownership Leases</u>	
		<u>% Ownership</u>	<u>Acreage</u>
Gulf Oil Corp.	103,937	50%	40,724.88
		37.5%	27,883.72
Hamilton Bros. Oil		50%	5,304.2
Joanna D. Hoefle	3,430		
Richard C. Hoefle	2,246	54.1%	1,320
Hunt Energy Corp.	103,640.36		
Hunt Petroleum Co.	34,783		
IGC Production	14,335.38	25%	3,506.83
Impel Corp.	14,880		
Lewis H. Larson	2,560		
Louisiana Land	23,047.25		
Burt G. Lowe	130		
Frank J. McGinley, Jr.	4,000.0		
William S. Marshall		5%	5,374
Marshall and Winston		40%	5,040
		25%	5,374
Martin Oil Service, Inc.	6,300		
May Petroleum	40		
Len Mayer	14,712		
Mobil Oil Corp	8,640		
Narmco		50%	22,694
National Refinery Cooperative Association		25%	42,357
Natural Resources	26,655	50%	31,443
T. Notestine	1,385.33		
Frank J. Novosel	2,413		
Odessa Natural Corp.	5,395	50%	4,802
Pacific Transmission Supply Co.		50%	5,304.2
Patrick Petroleum Corp. of Mich.		50%	8,511.68
Phillips Petroleum	43,922.41		
Reading & Bates Petroleum Co.	26,751		

TABLE 6.1 - Continued

STATE OIL AND GAS LEASE ACREAGE BY LESSEE

<u>Lessee</u>	<u>100% Ownership Lease Acreage</u>	<u>Joint Ownership Leases</u>	
		<u>% Ownership</u>	<u>Acreage</u>
Reserve Oil, Inc.	15,808		
Dean R. Rogers	640		
Nozma Rose	2,736		
Sanchez-O'Brien Petroleum Group	1,080		
Shell Oil Co.	61,191		
Robert Smith	4,218		
Sohio Petroleum	5,826	50%	4,802
		25%	920
Howell Spear	5,826		
Standard Oil of California	70		
William A. Stevenson	12,560		
Sumatra Oil Co.		45.9%	1,320
Sun Oil Co.	3,840	50%	620
		37.5%	320
		12.5%	27,883.72
Supron Energy Corp.	1,879	50%	620
		37.5%	320
		12.5%	27,883.72
David A. Swenson	21,138		
Tucker & Snyder Exploration		20%	5,040
Union Oil of California	4,600		
Webb Resources	84,173	75%	920
Western Reserves Oil	9,310	40%	10,418
Clayton W. Williams, Jr.	6,222		
Win-Mar Development		5%	5,374
James K. Wollard	25		
Delores Yates	1,700		
Total State Lease Acreage (Oil and Gas)	1,129,059.94		

TABLE 6.2

FEDERAL OIL & GAS LEASES IN IDAHO

<u>Lessee</u>	<u>Total Acreage</u>
Adobe Oil & Gas Corp.	3,284.42
Amoco Production Co.	119,862.10
American Petrofino Co.	48,251.18
American Quasar Petroleum of New Mexico	6,800.82
American Quasar Petroleum of New Mexico et al	53,662.58
Anderson, Donald B. Ltd. et al	215,357.37
Andregg, Kathy	4,210.53
Anschutz Corp. et al	23,796.49
Ballantyne, James H. Jr.	7,261.95
Bloom, J. W.	2,103.04
Campbell, Graham S.	13,918.6
Champlin Petroleum Co.	2,941.64
Chevron USA, Inc.	24,453.89
Cities Service Co.	194,005.04
Continental Oil Co.	32,290.15
Cook Oil & Gas Inc. et al	9,351.4
Crest Resources, Inc.	1,928.98
Croff Oil Co.	9,589.49
David, Robert W.	1,007
Dever, Dolores A.	525.8
Double Eagle Petroleum & Mining Co.	80
Duncan, Vincent J.	160
Edwards, Carolyn S.	5,127

TABLE 6.2 - Continued

Federal Oil & Gas Leases in Idaho (Continued)	
Edwards, Stanley M.	24,571.9
Elf Aquitaine, Inc.	1,280
Freedman, Martin J. et al	18,479.80
General American Oil Co.	21,590.64
Grace Petroleum Corp. et al	44,680.02
Great Basins Petroleum Co.	42,801.7
Grynberg, Celeste C.	5,960.46
Grynberg, Jack J.	10,195.32
Gulf Oil Corp. et al	65,664.54
Hamilton Brothers Oil Co. et al	18,921.35
Hartley, Esdras K.	1,788.91
Haun, W.G.	2,560
Hayward, Elizabeth	1,808.44
Hoefle, R.C.	89,934.13
Hoefle, R.C. et al	142,364.87
Hunt Energy Corp.	15,357.88
Hunt Nelson Bunker Trust Estate et al	50,408.38
IGC Production	13,230.86
Impel Energy Corp. et al	15,730.01
Intermountain Gas Co.	19,173.93
Kehl, Dale W. Jr. et al	1,601.31
Landers, Ruby L.	31.25
Larson, Lewis H.	37,330.5
Lasrich, Beverley	200
Louisiana Land & Exploration Co.	182,879.95

TABLE 6.2 - Continued

Federal Oil & Gas Leases in Idaho (Continued)	
McHugh, Jerome P.	7,342.34
Maddox, Bill J.	6,383.05
Maddox, Ruth	3,434.12
Maddox, Verba	1,737.6
Madrid, Louis S.	680
Marshall & Winston, Inc. et al	6,823.00
Martin Exploration Management Corp.	14,264.92
Martin Oil Service, Inc.	4,948.98
Mayer, Len	29,420.13
Mayer, Len et al	51,408.05
May Petroleum Co.	12,155
Meinhart, Arthur E.	1,930
Mitchell Energy Corp.	240
Mobile Oil	144,759.98
Moore, W.V.	1,280
Mountain Fuel Supply Co.	3.75
Natural Resources Corp.	79,997.68
Natural Resources Corp. et al	21,543.87
Notestine, Tom	223.32
Novosel, Patricia Y.	2,520
Odessa Natural Corp.	158,134.23
Owen, David F.	901.16
OXY Petroleum	2,560
Pacific Transmission Supply Co. et al	50,226.37
Patrick Petroleum Corp. et al	123,622.05

TABLE 6.2 - Continued

Federal Oil & Gas Leases in Idaho (Continued)

Phillips Petroleum Co.	119,670.11
Potts, Martha L.	4,318.99
Potts, Neal H.	640
Reading & Bates Petroleum Co.	16,141.6
Richey, Mark W.	2,483
Rogers, Dean R. Jr.	11,495.47
Sanchez O'Brian Petroleum Group	22,794.98
Scott, Charles W.	2,300
Shell Oil Co.	237,783.55
Slane, Floyd E.	640
Smith, Robert W.	5,494.48
Smith, Robert W. et al	2,372.46
Sohio Natural Resources Co.	26.5
Southworth, William W.	24.55
Spangler, Laura J.	7,358.32
Spear, Ellie	298.77
Spear, Howell	7,897.24
Stevenson, William A.	3,814.96
Stoltz, Wagner, & Brown et al	125,141.87
Sun Oil Co. et al	159,410.21
Supron Energy Corp.	14,985.35
Supron Energy Corp. et al	33,059.06
Taft, Milford	9,181.9
Texas Pacific Oil Co., Inc.	76,993.0
Tiperary Oil & Gas Co.	1,899.25

TABLE 6.2 - Continued

Federal Oil & Gas Leases in Idaho (Continued)

Toltec Drilling Co.	54,725.94
Transocean Oil, Inc.	119,124.81
Trujillo, Rosita	6,558.2
Tucker & Snyder Exploration, Inc.	370
Webb Resources, Inc.	51,251.13
Webb Resources, Inc. et al	41,501.17
Western Reserves Oil Co.	2,499.37
Wilson, Earl R. et al	7,454.22
Wolter, George P. Jr.	799.59
Total Federal Lease Acreage: (Oil and Gas)	<u>3,458,575.86 Acres</u>

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