

State of California
Department of Conservation

ANNUAL REPORT
of the
MINING AND GEOLOGY BOARD
1990-91



PETE WILSON, Governor
STATE OF CALIFORNIA

DOUGLAS P. WHEELER, Secretary
THE RESOURCES AGENCY

EDWARD G. HEIDIG, Director
DEPARTMENT OF CONSERVATION

State of California
MINING AND GEOLOGY BOARD

ANNUAL REPORT

1990-1991

BOARD MEMBERS:

James A. Anderson - Chairman

DeWayne Holmdahl

Bob Grunwald

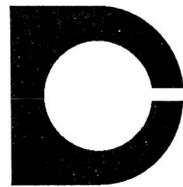
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MINING AND GEOLOGY BOARD
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COVER PHOTO: Mississippi Bar, located East of Sacramento, California. This site, owned by Teichert Aggregates, is a reclaimed gold and aggregate mining operation. The reclaimed area is now part of a riparian habitat. *Photo by Teichert Aggregates.*

ACKNOWLEDGEMENTS

Special thanks to Teichert Aggregates for the cover photo of Mississippi Bar; John L. Burnett, Division of Mines and Geology for the photo of Jamestown Mine and Milling Operation; Chris T. Higgins Division of Mines and Geology for the photo of the Mesquite Mine; Rich McJunkin, Division of Mines and Geology for the photo of Claudia Hallstrom at Thomas Edison Lake; C.J. Willis and M.W. Manson, Division of Mines and Geology for the photo of the sand boil formed by the Loma Prieta earthquake; Peggy Walker of the Division of Mines and Geology's Publication Unit for the map depicting progress of the classification/designation program, the 1990 non-fuel mineral production chart, and the 1990 Landslide Hazard Identification Map; and Fred Carillo, U.S. Bureau of Mines, Reno, Nevada, for the statistics used in the pie chart compilation of the 1990 non-fuel mineral production in California.

ABSTRACT

The State Mining and Geology Board ("the Board") has broad policy responsibilities for mineral resource conservation, mining, and reclamation pursuant to the Surface Mining and Reclamation Act of 1975 ("SMARA"). In Fiscal Year 1990-91, the Board took a number of actions fulfilling these responsibilities.

Specifically, the Board promulgated, and anticipates approval of, regulations establishing minimum, verifiable reclamation standards, the 1990 reporting fees schedule, and a process for handling financial assurance appeals filed with the Board.

The Board also certified two lead agency surface mining and reclamation ordinances, and reviewed 43 reclamation plan appeals filed with the Board. Currently the Board is processing 18 of the original 43 appeals.

The Board is continuing its classification mapping efforts in rapidly urbanizing areas of the State, including all of Placer and Stanislaus Counties, and portions of Riverside and San Bernardino Counties. This year the Board approved and transmitted the Nevada County mineral land classification report to the affected lead agencies. In addition, three classification studies were completed in response to petitions filed with the Board. Two designation appeals were received, but were not heard due to a lack of Board jurisdiction in the matters.

Fifty-four preliminary review maps of new and revised Special Studies Zones prepared pursuant to the Alquist-Priolo Special Studies Zones Act were reviewed and released for public comment. Final maps were then formally transmitted to affected local and State agencies for their use and information. In addition, policies and criteria were developed for implementation of the Seismic Hazards Mapping Act, and are expected to be adopted and in place by January 1, 1992.

CHAIRMAN'S COMMENTS

As California's citizens become more sensitive to the environment and impacts caused by certain land disturbing activities, State legislators introduce more and more legislation addressing environmental issues. Assembly Bill 3551 and AB 3903 (Sher, Chapters 1098 and 1101, respectively, Statutes of 1990), were examples of legislation which addressed impacts on the environment that may result from surface mining activities. Specifically, the bills amended the Surface Mining and Reclamation Act of 1975 ("SMARA") and Public Resource Code (PRC)



section 2207. The new provisions of SMARA require, for example, that: (1) all surface mining operators obtain lead agency approved financial assurances to ensure that reclamation occurs pursuant to the approved reclamation plan in the event that a mining operator defaults; (2) the Board establish minimum statewide standards for reclamation; (3) lead agencies conduct annual, rather than periodic, inspections of the mining operations located within their jurisdictions; and (4) lead agencies provide a Statement of Findings to the Board for those lands within their jurisdiction which have been classified or designated as containing significant mineral resource deposits prior to approving land uses which may preclude future mineral extraction from those sites. PRC section 2207 now requires annual reporting, and reporting fees, of all surface mining operations within the State. These new provisions affect the State, lead agencies and mining operators alike.

This year the Board, in response to new legislation, proposed four sets of regulations which will implement or make specific the new provisions of law. The new proposed regulations include: (1) minimum verifiable statewide reclamation standards; (2) a process for handling financial assurance appeals; (3) fees schedule regulations which provide a method for assessing reporting fees; and (4) seismic hazard mapping regulations, which provide guidance for the creation of seismic hazard maps displaying areas in the State prone to certain levels of seismic activities.

Over the course of this year, the Board reviewed 43 reclamation plan appeals filed pursuant to section 2770 of SMARA. The Board accepted, and began processing, approximately half of the appeals filed. It is anticipated that the Board will make determinations on the appeals by 1993.

In the area of mineral land classification, the Board and the Department of Conservation's Division of Mines and Geology worked together to streamline the classification process. Mapping is now done on a countywide basis, for all important mineral commodities.

Work has also continued in the geohazards program. The Board's Geohazards Committee is developing the guidelines and criteria for the seismic hazards maps pursuant to the recently

enacted Seismic Hazards Mapping Act. The purpose of the maps is to identify areas containing possible seismic activities to be used by local agencies when land use decisions are made.

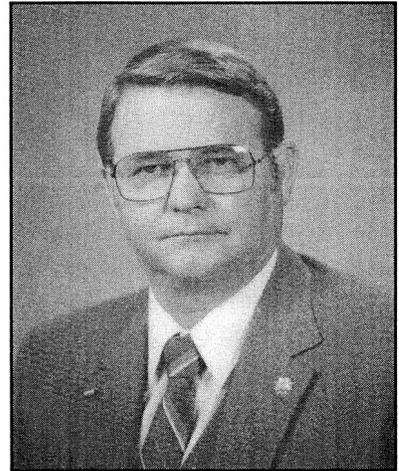
Outgoing Board members Anna C. Johs and Jack Streblov were recognized by the Board for their significant contributions to the State of California. Ms. Johs, who served on the Board from 1987 to 1991, was the Board's representative of local government with background and experience in urban planning. She was also a member of the Board's Geohazards Committee. Mr. Streblov, who also served on the Board from 1987 to 1991, provided expertise in the area of mineral resource conservation, development and utilization. Mr. Streblov served as Chairman for the Board's Mineral Conservation, Geologic Information Committee. Both members gave freely of their time and energy, and their work on the Board is much appreciated.

The Board looks forward to the many challenges the coming year will bring. The Board will be looking at ways to simplify existing regulations and become more efficient. The Board will also develop regulations authorizing the use of additional mechanisms for financial assurances for reclamation, and will develop a more equitable fees schedule for the 1991 reporting year. The classification of mineral lands in the remainder of Riverside County, all of Placer and Stanislaus Counties and portions of San Bernardino County will continue. Another Board agenda item includes the ongoing negotiations with the U.S. Forest Service to establish a Memorandum of Understanding for the coordination of surface mining and reclamation practice for surface mining operations located on U.S. Forest Service managed lands. The Board will continue its effort in providing policy and direction to assure the effective implementation of SMARA statewide and the continued development of information pertaining to geologic hazards.

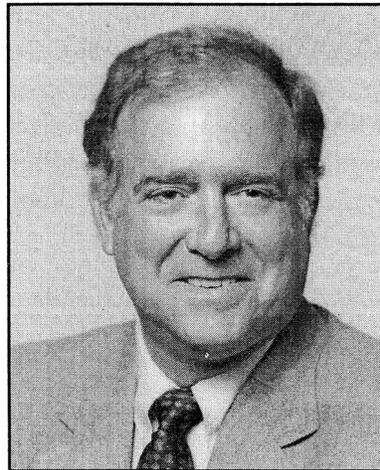
STATE MINING AND GEOLOGY BOARD MEMBERS



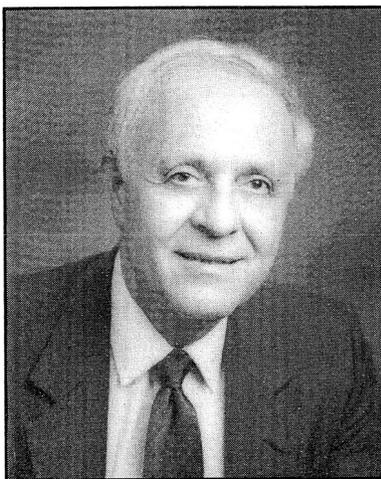
Bob Grunwald



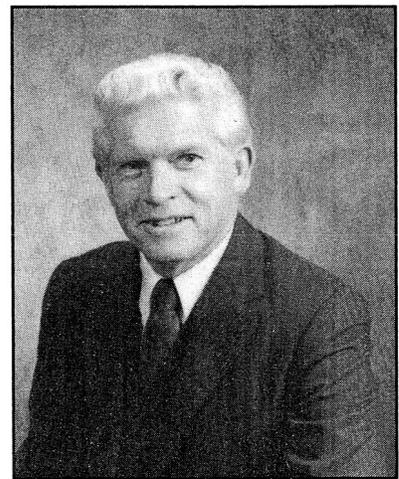
DeWayne Holmdahl



R. Gary Miller



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Part I

INTRODUCTION

State Mining and Geology Board, Organization and Responsibilities

The State Mining and Geology Board (“the Board”) is composed of nine members appointed by the Governor for four-year terms. By statute, the Board is comprised of individuals with specified professional backgrounds in geology, mining engineering, environmental protection, groundwater hydrology and rock chemistry, urban planning, landscape architecture, mineral resource conservation, seismology, and one public member.

The Board has broad policy responsibilities under the Surface Mining and Reclamation Act of 1975 for establishing and maintaining State policy for surface mining and reclamation and for the conservation and development of mineral resources.

The Board represents the State’s interest in the development of information necessary to the understanding and utilization of the State’s terrain, and seismological and geological information pertaining to earthquake and other geologic hazards. General policy for the State’s geological survey, the Department of Conservation’s Division of Mines and Geology (DMG), is established by the Board. These responsibilities recognize the impacts that California’s complex geology, large amounts of federally managed lands, high mineralization, and potential for geologic hazards have on the State’s economy, land use, and public safety.

The Board has policy responsibilities for the Alquist-Priolo Special Studies Zones Act. Under this Act, hazardous fault zones are delineated by the State Geologist. This information is provided to local governments to assure that structures for human occupancy are not built across such faults. In addition, the Board establishes guidelines and priorities that enable DMG to carry out provisions of the Landslide Hazard Identification Program as well as the newly enacted Seismic Hazard Mapping Act of 1990.

Under the Seismic Hazards Mapping Act (AB 3897 [Brown], Chapter 1168, Statutes of 1990), the Board has new policy responsibilities in the area of protecting public health and safety from potential seismic hazards which may occur in specific areas throughout the State. The Act requires the Board to develop regulations establishing guidelines for which local cities and counties delineate zones where seismic hazards may pose a threat.

To enable the Board to meet its responsibilities, four permanent committees have been established. These include the Policy Committee, the Environmental Protection Committee, the Geohazards Committee, and the Mineral Conservation and Geologic Information Committee.

Part II.

MAJOR BOARD ACTIONS PURSUANT TO THE SURFACE MINING AND RECLAMATION ACT OF 1975

A. MINED LAND RECLAMATION

California's Surface Mining and Reclamation Act (SMARA) is the State's solution to resolve two seemingly contradictory demands—the need for a continuing supply of mineral resources, and the assurance that significant adverse impacts of mining will be mitigated. SMARA created a program that assures the reclamation of mined lands while providing mineral information essential for local management of mineral resources needed for the future.

1. Summary of Reclamation Planning in California

The Department of Conservation's Division of Mines and Geology (DMG) implements a Mined Lands Reclamation Program which carries out many of SMARA's reclamation provisions. The Board sets policy for this and other DMG programs, and is the agency responsible for certifying local surface mining reclamation ordinances as being in compliance with State law.

Pursuant to SMARA, cities and counties having active mines within their jurisdiction are designated as "lead agencies". There are 111 such agencies in California currently. Ordinances adopted by local governing councils and boards, and certified by the State Mining and Geology Board ("the Board"), provide the regulatory framework within which mining and reclamation activities are performed. These ordinances incorporate the requirements of SMARA and reflect the policies of the Board. They may also contain additional, more restrictive requirements deemed necessary by a lead agency to ensure effective reclamation within its particular jurisdiction.

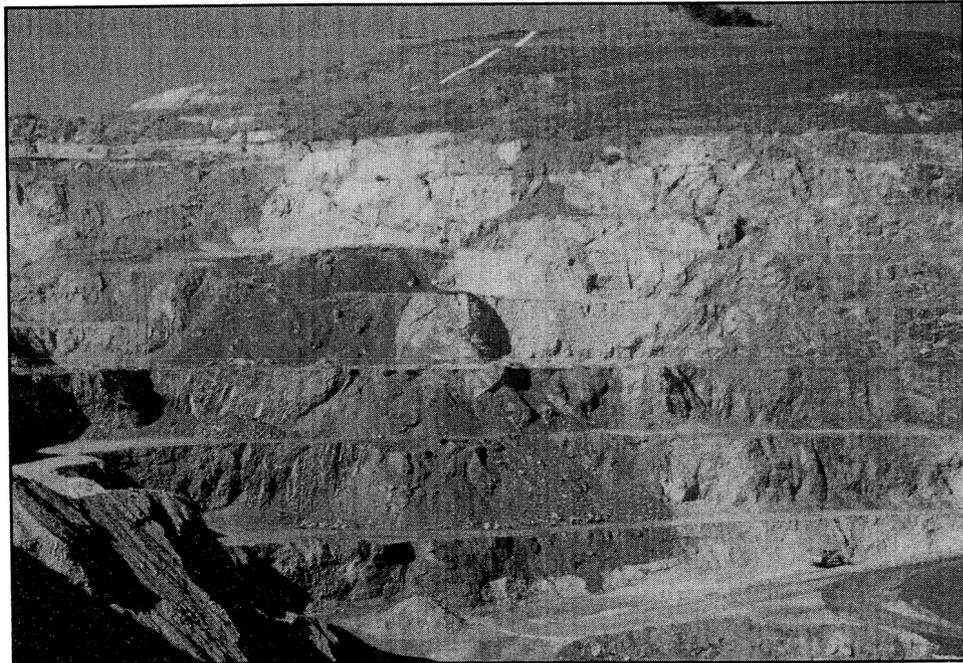
Under SMARA, a mining operator is responsible for the preparation and submission of a reclamation plan to the lead agency. Local government approval of this plan is required before mining can begin. The reclamation plan must include information on the site, the mineral commodity, the mining method, processing requirements, and the specifics of the reclamation program to be undertaken (such as recontouring and revegetation).

1991 Amendments to SMARA- With the passage of AB 3551 and AB 3903 ([Sher] Chapters 1097 and Chapter 1101, respectively, Statutes of 1990), came new requirements pertaining to the reclamation of mined lands. As amended, SMARA now requires mining operators to obtain lead agency approved financial assurances for reclamation to guarantee mined land reclamation. The financial assurances, which are to be made payable to the lead agency and to the State, are calculated based on the overall cost of the operation's approved reclamation

plan. Financial assurances for existing operations must be in place by January 1, 1992, while new operations are required to obtain financial assurances prior to operating. Financial assurances may take the form of surety bonds, irrevocable letters of credit, or trust funds. The Board has the authority to adopt regulations establishing additional forms of financial assurances for reclamation.

According to the law, surface mining operators have the ability to file financial assurance appeals with the Board if they disagree with the lead agency's action (or inaction) with respect to the proposed financial assurances for reclamation. In 1991, the Board promulgated regulations establishing a process for review and hearing of these appeals. Using the regulatory timeframe established by the Board, and if the regulations are approved by the Office of Administrative Law, the regulations take effect by the end of 1991.

New provisions in SMARA also require the Board to adopt regulations for minimum statewide verifiable reclamation standards. The Board, DMG and concerned members of the private sector participated in the development of proposed reclamation standards regulations. The regulations, if adopted, will address the following areas: (1) wildlife habitat; (2) backfilling, regrading, slope stability, and recontouring; (3) revegetation; (4) drainage, diversion structures, waterways, and erosion control; (5) prime and other agricultural land reclamation; (6) building, structure, and equipment removal;



Open pit mining activities occur throughout the State. Most open pit quarries are required, such as this one, to "bench" the hillside which stabilizes the slopes and provides erosion control. *Staff photo.*

(7) stream protection; (8) topsoil salvage, maintenance, and redistribution; and (9) tailing and mine waste management. These regulations by statute (SMARA section 2773), are required to be adopted by January 1, 1992.

Additional amendments to SMARA mandate lead agencies to conduct annual, rather than periodic, inspections of active and idle surface mining operations within their jurisdictions. The annual inspections are to ensure that mining operations are complying with their approved reclamation plans. Inspections, for the first year, must occur by January 1, 1992. Subsequent inspections must occur annually, within six months of an annual reporting anniversary date to be established by the State.

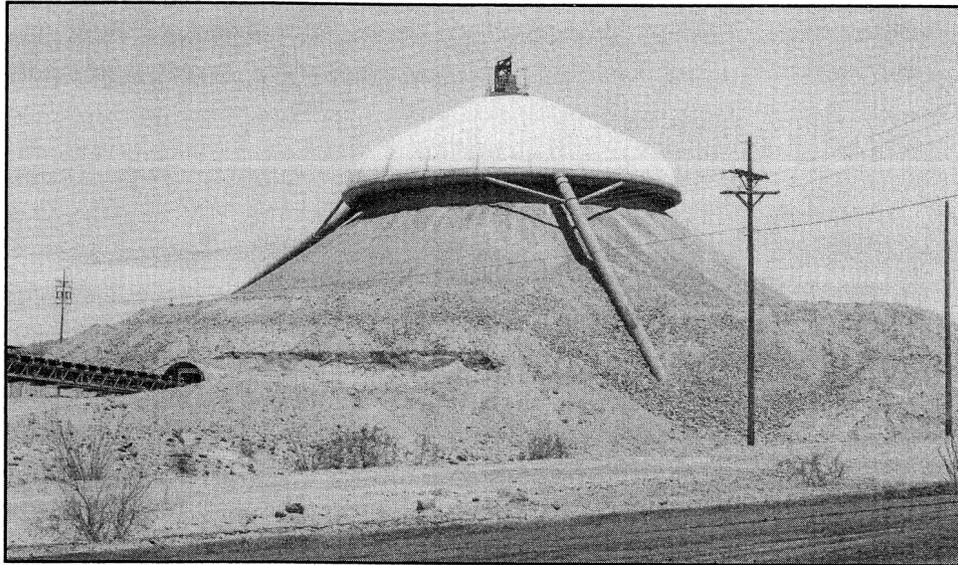
Changes to PRC section 2207 require mining operators to file annual reports with lead agencies and the State, together with a reporting fee, by July 1, 1991 (the first reporting year), and on an anniversary date established by the State every year thereafter. The reporting form, developed by the Department and approved by the Board, requires specific information on the mining operation and reclamation plan, and will provide a data base on mining operations within California. The Board was required to adopt emergency fees schedule regulations by May 1, 1991. The fees to be assessed for mining operations were not to exceed \$2,000 nor be less than \$50 annually. For the first reporting year only, the Board determined to assess the fees based on acreage subject to the reclamation plan. The Board, as required by law, will adjust the methodology for reporting fees annually.

Who is subject to SMARA? With the exception of specified exemptions and provisions for vested operations, "...no person shall conduct surface mining operations unless a permit is obtained from, a reclamation plan has been submitted to and approved by and financial assurances for reclamation have been approved by, the lead agency for such operation...". For the purpose of this Act, a lead agency is defined as "the city, county, San Francisco Bay and Conservation Development Commission, or the Board, which has the principal responsibility for approving a surface mining operation permit or reclamation plan pursuant to the Act."

How is SMARA implemented? California's approach to reclamation planning is to include the mining operator, local government, and the State as active participants in the process. This stresses a cooperative approach rather than an adversarial one, and resources and knowledge are combined to create cost-effective and environmentally sound reclamation plans. The operator's financial interest and investment are considered, as well as community, regional and statewide interests in mineral resource conservation, resource management, and land-use planning.

What happens if an agency does not have a certified ordinance? In the absence of a certified lead agency surface mining and reclamation ordinance, the

Board is empowered to review and approve reclamation plans to assure that the mined lands reclamation objectives of SMARA are met. Reclamation plans approved by the Board as such are not subject to modification at a later date by the lead agency with permitting jurisdiction, but may be amended by the Board. The Board returns these reclamation plans for lead agency administration once a Board-certified ordinance is in place at the local level.



Mesquite Mine, Imperial County. As ore is conveyed from the primary crusher, it is stockpiled (as shown), and covered by a large circular dome. The dome controls dust which can be a nuisance in a windy area such as this. *Photo by Chris T. Higgins, Division of Mines and Geology.*

What is the role of the mining operator? A mining operator is responsible under SMARA for the preparation and submission of a reclamation plan and financial assurances for reclamation to the lead agency. Approval of the plan and financial assurances by the lead agency is required before mining can begin. The reclamation plan includes information on the site, the mineral commodity, and the specifics of the reclamation program to be undertaken.

Vested rights. Section 2776 of SMARA exempts landowners and/or operators who have obtained a vested right to conduct surface mining operations prior to January 1, 1976, from the requirement to obtain a permit to mine. However, some lead agencies may have required surface mining operation permits (pursuant to their surface mining ordinances) prior to January 1, 1976. All persons who conducted surface mining operations on or after January 1, 1976, are subject to SMARA's reclamation provisions for areas disturbed by mining activities after that date, whether such operations were commenced prior to that date or not.

Record keeping. A database of information on mining and reclamation in California will now be established and maintained at the State level. In addition

to the information provided by mining operators, information on mining permits and reclamation plans will be obtained from the lead agencies. By July 1, 1991, lead agencies are required to file copies of all mining permits and approved reclamation plans with the State Geologist. Annually thereafter, lead agencies are required to file copies of any amendments or conditions to previously approved documents with the State. New permits and reclamation plan approvals must be forwarded to the State within 30 days of approval.

Technical Assistance. Finally, section 2774(c) provides that prior to lead agency approval of new or amended reclamation plans or financial assurances for reclamation, such documents are required to be submitted to the State Geologist for review and comment. Such assistance is provided through the Reclamation Program staff, which has the technical expertise necessary for the review of reclamation plans.

2. Certified Ordinances

Throughout the year, the Board adopted the following resolutions certifying city and county surface mining and reclamation ordinances as being in compliance with State policy governing the regulation of surface mining and reclamation in California:

- Resolution #90-02 was adopted by the Board on September 21, 1990, certifying the City of Lake Elsinore's Ordinance, adopted by the City on August 24, 1990.
- Resolution #90-03 was adopted by the Board on September 21, 1990, recertifying the County of San Benito's Ordinance, adopted by the County on June 5, 1990.

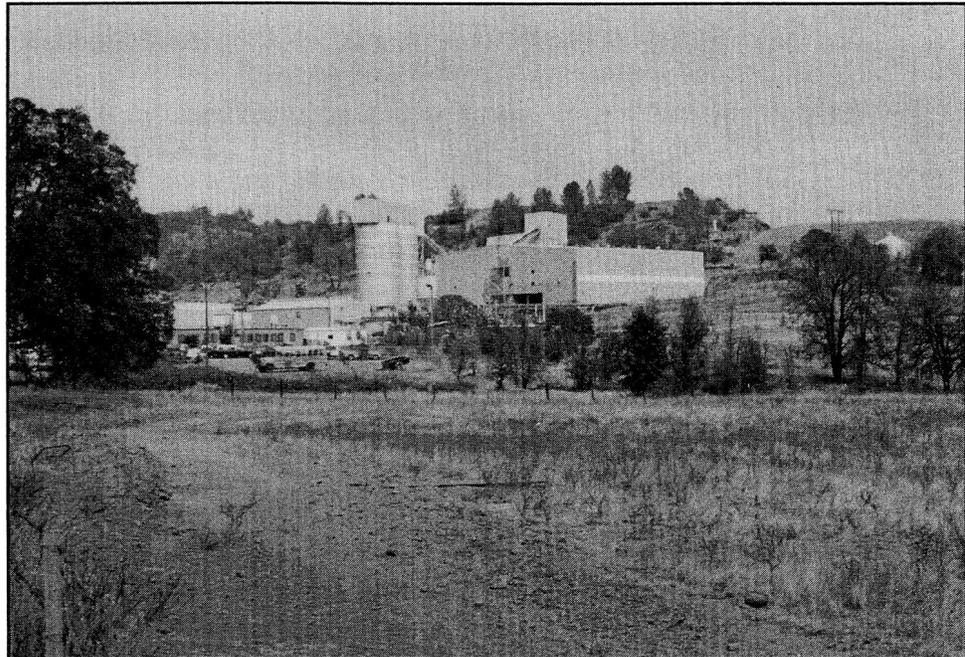
3. Reclamation Plan Appeals Process

SMARA, as amended by AB 747, Sher, (Chapter 975, Statutes of 1987), provided a "window" period for vested mining operators to file reclamation plans for approval by the lead agencies in compliance with reclamation planning provisions of SMARA. The amendments also created an appeals process to the Board, which was intended to assure speedy review and action by lead agencies based on the merits of the reclamation plan's compliance with specified provisions. Regulations establishing procedures for processing reclamation plan appeals filed with the Board, were adopted in Fiscal Year 1988-89.

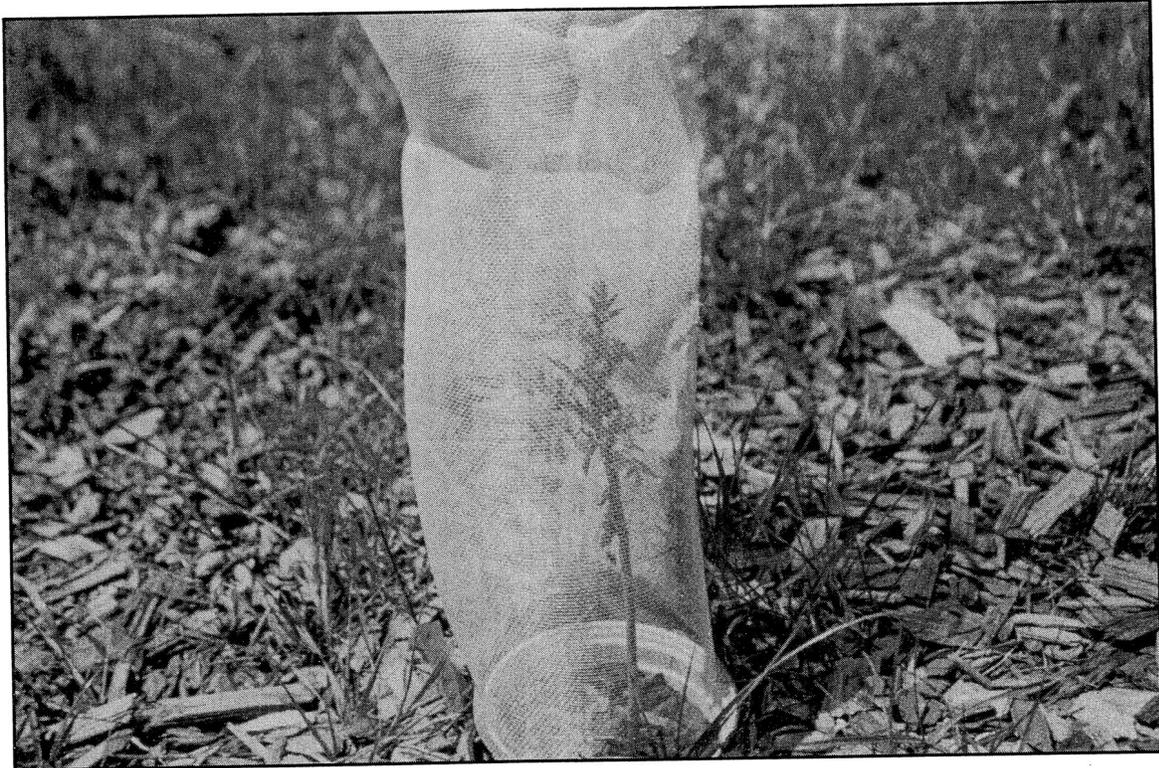
The Board's regulations set standards for site inspections and committee structure review. After the committee reviews the appeals that are accepted, the full Board must vote on the committee's recommendations. The Board received 43 reclamation plan appeals filed under section 2770 of SMARA, and accepted and is currently processing 18 of those appeals.

4. Memorandum of Understanding Between State and Federal Agencies

As a result of a public workshop held on January 22, 1988, sponsored by the Board (see 1988 Annual Report) on the applicability of SMARA to federal lands, the Department of Conservation and the Board formed a Task Force to review an existing Memorandum of Understanding (MOU) between the State of California Resources Agency, the U.S. Forest Service (USFS), and the Bureau of Land Management (BLM). On February 7, 1990, a new MOU was signed between the State of California and BLM. Negotiations are ongoing with USFS. The purpose of the MOU is to streamline and coordinate the review and approval of reclamation plans by local lead agencies and federal agencies for operations conducted on federal lands.



Jamestown Mine and Milling Operation, located within Tuolumne County. This is the largest gold flotation mill in the United States. *Photo by John L. Burnett, Division of Mines and Geology*



Revegetation of a mined site is often considered an acceptable form of reclamation. In this instance, a tree was planted and is protected by a metal screen. The screen prevents the tiny tree from being consumed by hungry predators. *Staff photo.*

Mining site to fishing site. Thanks to reclamation, this mined quarry is now a popular fishing and swimming hole to be enjoyed by young and old alike. *Staff photo.*



B. MINERAL RESOURCES CONSERVATION

1. Summary of Classification-Designation Program

California is one of the nation's leading mining states in terms of both value and diversity of minerals produced – approximately 1,200 active mines and quarries produce about \$2.7 billion worth of nonfuel minerals annually.

In the early 1970's, the Department of Conservation's Division of Mines and Geology (DMG) estimated that the State would face a \$17 billion loss of mineral resources by the year 2000 if present land uses continued. This projected loss represents almost nine years of the State's current mineral production.

Despite this projected forecast, land use decisions in California are often made without knowledge of the location of important underlying mineral deposits and their value to the State, the nation and society overall. California is faced with increasingly difficult land use decisions, and the production of mineral resources must compete with other land uses such as agriculture, timber harvest, urban development, and recreational, sensitive ecological or scenic areas. In many areas, pressure from competing land uses has severely reduced or completely eliminated access to available mineral resources. Indeed, the rapid growth of many California communities and the incompatibility of mining with most other land uses has led to anti-growth and anti-mining initiatives being placed before the voters throughout California, creating yet another barrier to mineral resource extraction. Often, a mineral resource is needed for the very use which threatens it. For example, construction aggregate deposits, needed for the construction and repair of roads and buildings, are often built over before the resource can be extracted.

In an effort to remedy this problem, SMARA provides for a mineral lands inventory process termed "classification-designation", which jointly involves the State and local government. The Division of Mines and Geology and the Board are the State agencies responsible for administering this process. Information on the location of important mineral deposits is developed by DMG through the process of mineral land classification. This information can then be used by the Board in designating those deposits that are of economic significance to a region, the State or the nation. The objectives of this process are to provide local agency decision makers with information on the location, need, and importance of mineral resources within their jurisdiction, and to require that this information be considered in local land-use planning decisions. This objective is met through the adoption of local mineral resource management policies, which provide for the conservation and development of these resources.

During the first phase of this program, classification, the State Geologist directs the preparation of a geologic inventory of selected mineral deposits within selected study regions. The study regions are based on jurisdictional boundaries (primarily counties, groups of counties, or portions of counties) and are classified for all

mineral commodities in a single pass where impending land-use decisions may preclude future mineral resource recovery. The primary objective of mineral land classification is to ensure that the mineral potential of land is recognized and considered in the land-use planning process.

The State Geologist classifies mineral lands solely on the basis of geological factors. Existing land-use, by statute, is not considered. Classification of an area as a Mineral Resource Zone 2a or 2b (MRZ-2a or MRZ-2b) indicates the existence of a deposit that meets certain criteria for value and marketability. The classification report also describes other categories of mineral resource zones—MRZ-1, MRZ-3a, MRZ-3b, and MRZ-4. MRZ-1 is used to indicate areas that have little likelihood for the presence of significant mineral resources. MRZ-3a is used to indicate areas that contain known mineral resources of undetermined mineral resource significance. MRZ-3b signifies areas that contain inferred mineral resources of undetermined mineral resource significance. Areas containing no known mineral occurrences are labeled MRZ-4.

In many regions, large portions of the areas classified as MRZ-2a or MRZ-2b are already committed to various urban uses, which limit access to the underlying resources. As an aid to local planning agencies, classification reports prepared for metropolitan areas also identify MRZ-2a or MRZ-2b quality aggregate deposits, or portions of these deposits, that have not been preempted by incompatible land uses such as urbanization. These nonurbanized areas, called Aggregate Resource Areas (ARA), are important because they contain aggregate resources that remain potentially available for future use. The identification of ARA also facilitates estimating the volume of aggregate material that is available in the region. Aggregate Resource Areas may be considered for designation by the Board.

Once the classification report has been completed, the Board may choose to proceed with the second step in SMARA's mineral lands identification process—designation of those deposits that are of regional or statewide significance. In contrast to classification, which inventories mineral deposits without regard to land use, the purpose of designation is to identify those areas that are of prime importance in meeting the future needs of the study region and that remain available from a land use perspective.

The first mineral commodity selected by the Board for classification by the State Geologist was construction aggregate—sand, gravel, and crushed rock. The importance of construction aggregate is often overlooked even though it is an essential commodity in today's society. Aggregate is a key component in products such as Portland cement concrete, asphaltic concrete (blacktop), railroad ballast stucco, road base, and fill.

Aggregate provides from 80 percent to 100 percent of the material volume in these products. Portland cement concrete is used to produce concrete blocks and pipes, foundation pilings, precast concrete beams, and tilt-up concrete walls. Therefore,

1990 NONFUEL MINERAL PRODUCTION IN CALIFORNIA

(Values in Thousands of Dollars)

STATE TOTAL: \$2,722,343 (est.)
(Value in thousands)

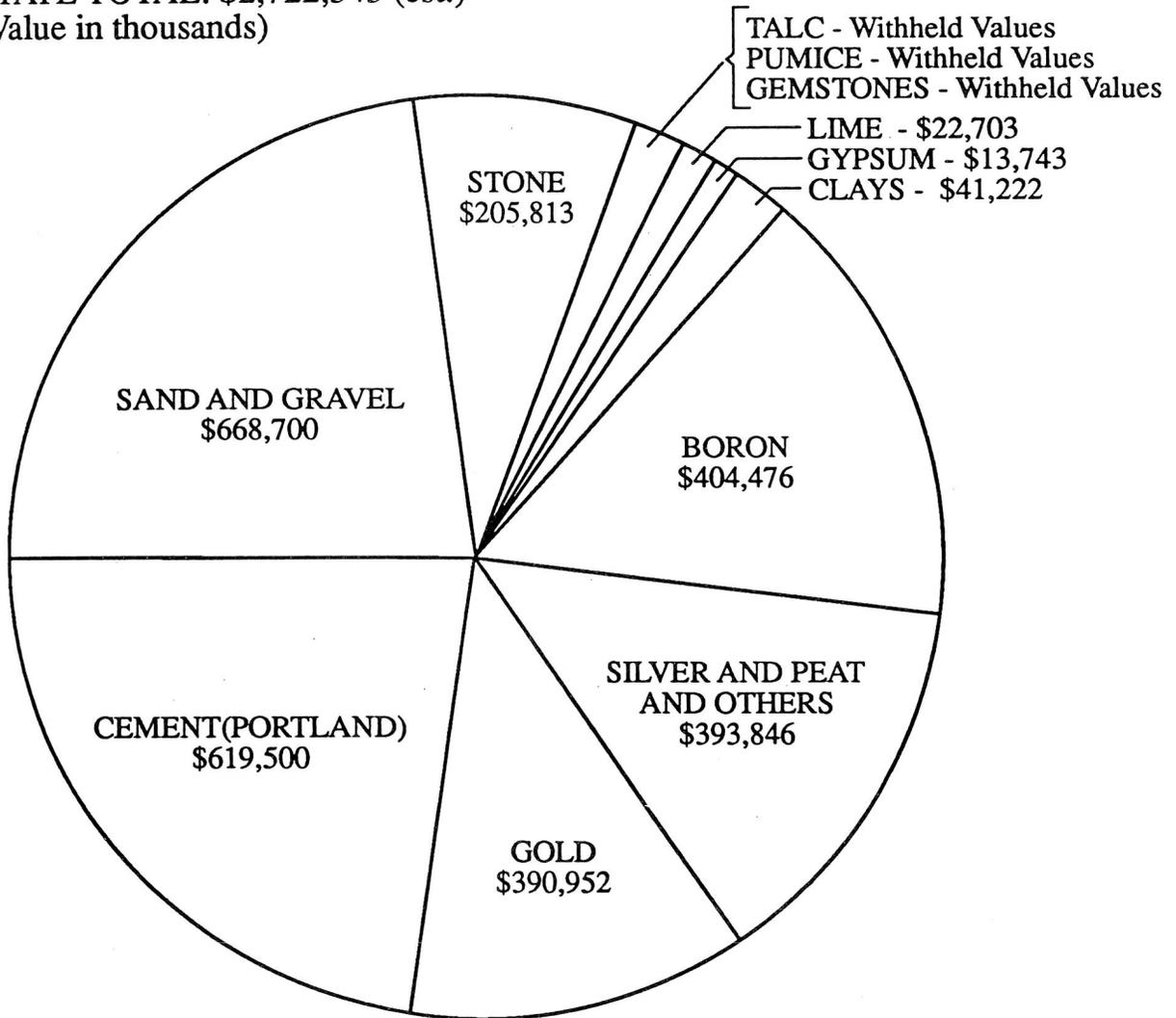


Figure 1. Combined value of mercury, asbestos, barite, calcium, chloride, copper, diatomite, feldspar, iron ore, magnesium compounds, molybdenum, perlite, potash, rare-earth concentrates, salt, sodium sulphate, talc and prophyllite, titanium concentrates, tungsten ore and concentrates, and withheld values.

Source: U.S. Bureau of Mines Yearbook 1990, Volume III

aggregate is very important to the construction industry and the local economy.

The construction industry is dependent on readily available aggregate deposits within reasonable distance to market regions. Because aggregate is a low unit-value, high bulk-weight commodity, aggregate for construction must be obtained from nearby sources in order to minimize costs to the aggregate consumer. If nearby sources do not exist, then transportation costs can quickly exceed the value of the aggregate. In fact, transportation cost is the one of the most important factors considered when defining the market area for an aggregate operation.

With the passage of SB 1300 in 1979, the State also initiated mineral land classification studies in the highly mineralized Sierra Nevada and the California Desert Conservation Area, where focus is on the potential for minerals other than construction aggregate in more rural areas of the State.

2. SMARA's Mineral Land Classification Schedule

In 1989, the Board determined to revise the existing mapping priorities and requested DMG to modify its procedures for mineral land classification. The DMG was instructed to complete classification studies on a county-wide basis for all mineral commodities. Priorities are based on the: (1) relative threat of urbanization; (2) perceived needs of individual counties; and (3) other factors that may be linked to activities currently underway. Nevada County was scheduled to be the first county in which classification for all mineral commodities on a county-wide basis would occur. In 1990-91, portions of Riverside County (specifically Western Riverside County, and the Temescal Valley) were selected for the county-wide classification process. Portions of San Bernardino County and all of Placer and Stanislaus Counties are currently undergoing the mineral land classification process. Reports on these studies are scheduled for release within the next few years.

3. Classification Reports Completed in Fiscal Year 1990/91

In January 1991, the Board accepted and formally transmitted to affected lead agencies, a county-wide mineral classification report for Nevada County. Major findings of the study are:

- Fifteen areas covering approximately 67 square miles of land are classified as containing significant precious and base metal resources. These deposits include three massive sulfide deposits enriched in copper and zinc, two disseminated sulfide deposits enriched in gold, and 11 cavity-filling quartz-vein systems enriched in gold.
- Eight areas covering approximately 22 square miles are classified as containing significant placer gold resources.
- Two localities, the Upper Spanish Mine and the Democrat Mine (each covering approximately 0.1 square miles), are classified as containing significant inferred resources of barite.

- Twenty-eight acres covering approximately 23.9 square miles of Nevada County have been classified as MRZ-2 for construction aggregate resources. This represents approximately 2.4 percent of the County.
- Of the areas classified MRZ-2 for construction aggregate, approximately 19.5 miles have been identified as Aggregate Resource Areas. This represents approximately 2 percent of the County.
- Thirteen areas have been identified as Highly Significant in terms of the amount of material present and the proximity of currently permitted aggregate mining operations.
- Nevada County is a net importer of construction aggregate and imports 20 to 30 percent more aggregate than is produced within the County.
- There are currently six permitted aggregate mining operations within Nevada County with combined reserves of 28,560,000 tons.

a. Classification Reports Prepared in Response to Petitions

Mineral deposits threatened by incompatible land uses that may prevent mining may be brought to the Board's attention by petition. To qualify for a petition, the subject deposit(s) must meet a certain economic threshold and be faced with an imminent land-use threat related to urbanization.

Pursuant to 1990 amendments, SMARA section 2764(b) now requires petitioners to pay the costs associated with the classification petition process. The Board and DMG revised procedures for mineral-land classification petitions to reflect this requirement.

In September 1990, the Board accepted and formally transmitted to affected lead agencies, a mineral land classification report of the Hannah Ranch Site, Tulare County, California for Portland Cement Concrete-Grade Aggregate in response to a petition filed by Kaweah River Rock Co., Inc. Major findings of this study are:

- High quality aggregate resources occur in the study area.
- Aggregate test results provided by the petitioner and analyzed by DMG staff indicate that the aggregate can meet or can be processed to meet the published standard specifications of the California Department of Transportation for Portland Cement Concrete (PCC).
- Aggregate resources within the Hannah Ranch site far exceed the minimum threshold value of 5 million 1978 dollars (approximately 9.7 million 1989 dollars) established by the Board.
- The Hannah Ranch site has been classified MRZ-2a for Portland Cement Concrete aggregate.

At the July 23, 1991 regular business meeting of the Board, the following mineral land classification studies prepared in response to petitions were approved:

(1) South Tracy site, San Joaquin County, for Cement Concrete-Grade Aggregate as petitioned by Teichert Aggregates; and (2) Jamestown Mine Property, Tuolumne County, for Lode Gold Resources as petitioned by Sonora Mining Corporation. Major findings of the South Tracy site study are:

- Aggregate from the South Tracy site can meet or can be processed to meet the published standard specifications of the California Department of Transportation (Caltrans) for portland cement concrete grade aggregate.
- Aggregate resources within the South Tracy site far exceed the minimum threshold value of 5 million 1978 dollars (10.15 million 1990 dollars) established by the Board.
- The South Tracy site has been classified MRZ-2 for portland cement concrete aggregate. Existing mineral land classification maps covering the area have been amended to reflect the change from MRZ-3 to MRZ-2 classification.

Major findings from the Jamestown Mine Property study are:

- The Jamestown Mine property contains significant measured and indicated reserves and significant inferred resources of gold.
- The areas encompassing the Rawhide, Crystalline, Harvard, Dutch-App, and Jumper deposits are classified MRZ-2a because they contain significant indicated or measured reserves of precious metal resources.
- The remainder of property located within the main mineralized zone of the Mother Lode gold belt is classified MRZ-2b because the area contains significant inferred resources of gold.
- The Jamestown Mine property located outside the main mineralized zone of the Mother Lode gold belt is classified MRZ-3a because the economic significance of gold resources contained within this area cannot be determined from available data.

4. Designation Appeals Review by the Board in 1990

Pursuant to SMARA Section 2775, any person who is aggrieved by the granting of a permit to conduct surface mining operations in an area of statewide or regional significance, may, within 15 days of the granting of the appeal and in accordance with the guidelines established by the lead agency, appeal this decision to the Board. The Board received two designation appeals in Fiscal Year 1990/91. The first appeal, filed by citizens concerned with a project permit approved by Sonoma County, was not accepted because the Board lacked jurisdiction to accept and hear the appeal.

The second designation appeal filed with the Board was not accepted as it was not filed within the required fixed time-frames.

Progress of Classification-Designation Program

Index map of California, showing location and status of mineral land classification study areas being classified and/or designated in the SMARA Program as of June 30, 1991.

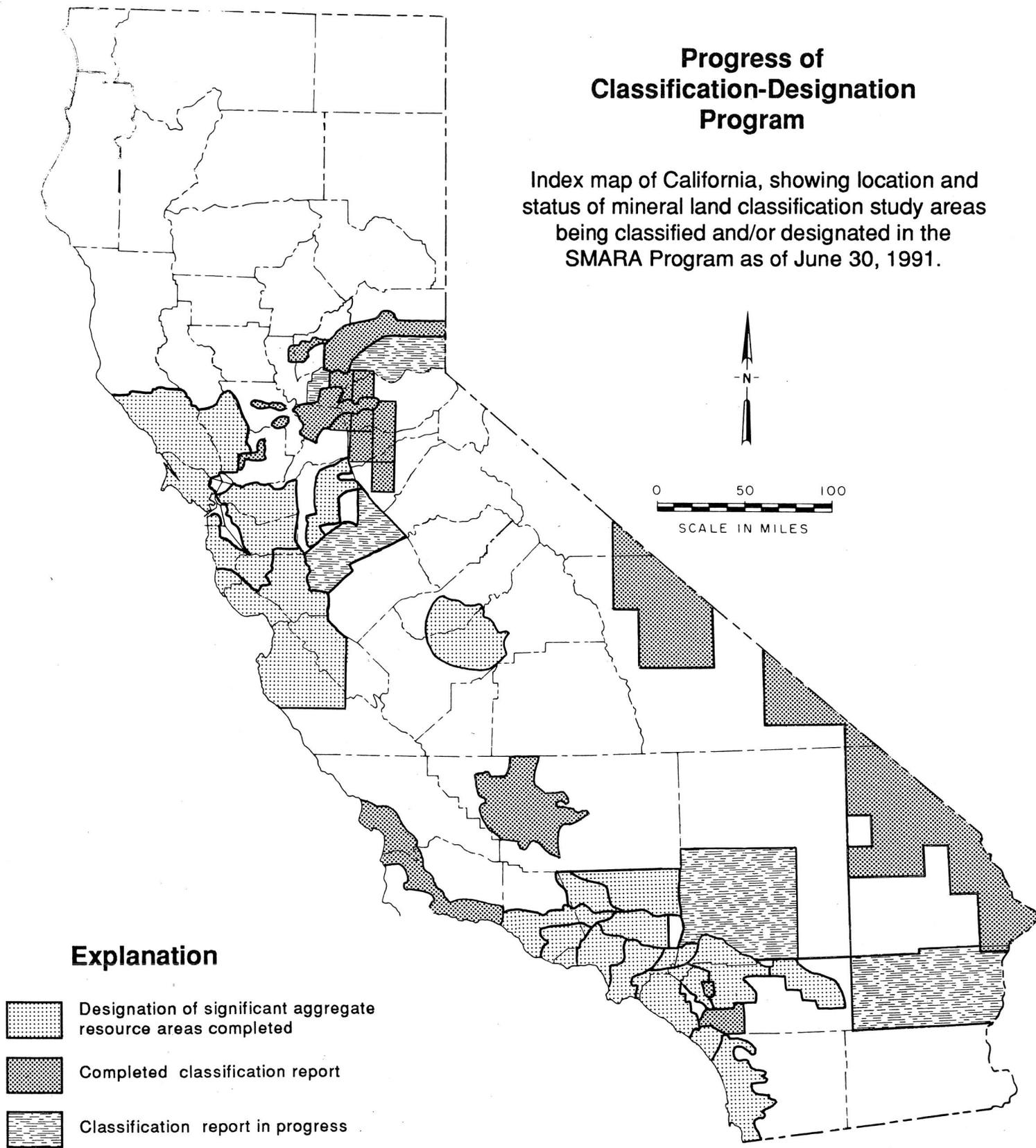


Figure 2. Map of California depicting progress of the Classification-Designation Program.

5. Local Agency use of Classification-Designation Information

Once a classification or designation report has been received by local lead agencies, SMARA requires that these agencies establish mineral resource management policies (MRMP's) to be incorporated into their general plans. The MRMP's must: (1) recognize the mineral information provided by the State; (2) assist in the management of land use that affects areas of statewide or regional significance; and (3) emphasize the conservation and development of identified mineral deposits. In 1988, the Board adopted regulations to assist lead agencies in the development of MRMP's.

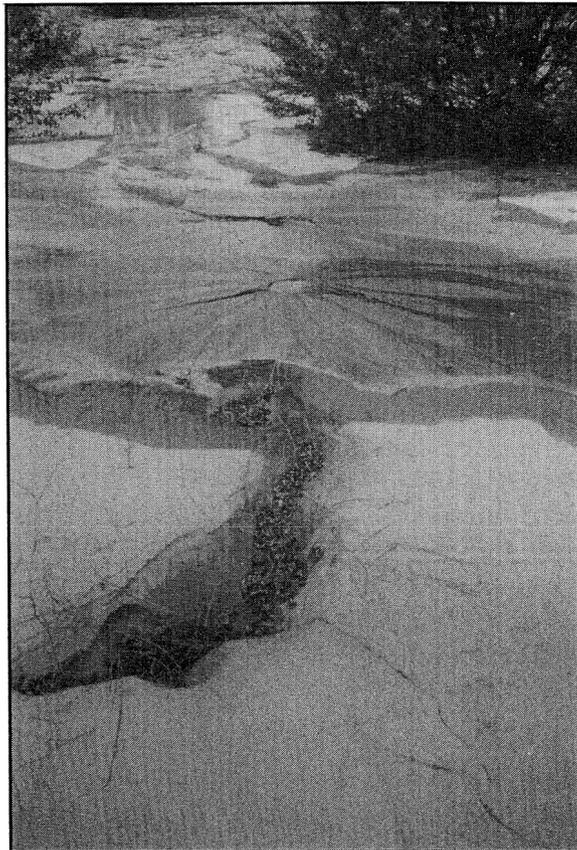
Information available in classification and designation reports is being used with increasing frequency by local agencies in planning studies and permit decisions. For example, during the past fiscal year, mineral resource information developed by the classification-designation program was used in at least 24 local agency environmental documents. These documents are monitored carefully by the Department of Conservation to ensure that factual information on classified and/or designated areas is brought before local decision-makers.

Part III.

MAJOR BOARD ACTIONS RELATED TO GEOLOGIC HAZARDS PROGRAM, RESEARCH AND NEW RESPONSIBILITIES

California's propensity for geologic hazards—earthquakes, landslides, volcanism—underscores the importance of understanding these phenomena and their potential effects upon society. In 1973, the Division of Mines and Geology (DMG) estimated that the cost of these hazards from 1970 to 2000, if current land-use practices continue, would amount to \$38 billion. To foster a better understanding of these hazards, the Board represents the State's interest in developing and disseminating related geologic information through the State's geologic survey—DMG.

The Board is also charged with more specific responsibilities under such laws as the Alquist-Priolo Studies Zones Act, Landslide Hazard Identification Act and the newly established Seismic Hazards Mapping Act (AB 3897, [Brown] Chapter 1168, Statutes of 1990).



Sand boils, such as these, were formed by the Loma Prieta earthquake. These sand boils erupted April 18, 1990. Photo by C.J. Wills and M.W. Manson, Division of Mines and Geology.

1. Alquist-Priolo Studies Zones Act

The Alquist-Priolo Studies Zones Act provides for the mapping of active faults by DMG under policies established by the Board. Maps of these faults—Special Studies Zones—are provided to local governments for their land-use planning and decision making. The Act prohibits construction of structures for human occupancy, as defined, across the trace of an active fault.

Fifty-four preliminary review maps (listed below) of new and revised Special Studies Zones were sent to affected local and State agencies on May 1, 1991. Following a 90-day public comment period ending August 1, 1991, and the Board's review of comments submitted in regard to the maps, these preliminary maps will be superseded by Official Maps scheduled to be released November 1, 1991.

- | | | |
|------------------------|-----------------------|---------------------|
| 1. Fields Landing | 2. Fortuna | 3. *Hydesville |
| 4. Sams Neck | 5. Dorris | 6. Macdoel |
| 7. Sheep Mtn. | 8. Red Rock Lakes | 9. Bray |
| 10. Sharp Mtn. | 11. Tennant | 12. Garner Mtn. |
| 13. Rainbow Mtn. | 14. Fort Bidwell | 15. Lake City |
| 16. Cedarville | 17. Warren Peak | 18. Eagle Peak |
| 19. Eagleville | 20. Snake Lake | 21. Porcupine Butte |
| 22. Indian Spring Mtn. | 23. East of Ponderosa | 24. Timbered Crater |
| 25. Day | 26. Burney Falls | 27. Dana |
| 28. Fall River Mills | 29. Pittville | 30. Burney |
| 31. Cassel | 32. Hogback Ridge | 33. Coble Mtn. |
| 34. Murken Bench | 35. Jellico | 36. Old Station |
| 37. Swains Hole | 38. Standish | 39. Stony Ridge |
| 40. Milford | 41. Herlong | 42. Calneva Lake |
| 43. McKesick Peak | 44. *Doyle | 45. Constantia |
| 46. *Los Gatos | 47. *Laurel | 48. *Pitas Point |
| 49. *Fillmore | 50. Moorpark | 51. *El Monte |
| 52. *La Habra | 53. La Jolla | 54. Point Loma |

*Revised zone map

Agencies affected by these Special Studies Zones include the Cities of Fortuna, La Habra Heights, Rosemead, San Diego, San Marino and Whittier, and the Counties of Humboldt, Lassen, Los Angeles, Modoc, Orange, San Diego, Santa Clara, Santa Cruz, Shasta, Siskiyou, and Ventura.

2. The Landslide Hazard Identification Act

The Landslide Hazard Identification Act (LIHA) was chaptered in September 1983, becoming effective January 1, 1984 (Chapter 997, Statutes of 1983). This Act formally recognized the problem of unstable slope hazards (landslides, mudslides, debris flows, slumps, soil creep, etc.) that occur throughout much of California. These problems have been underscored by the tragic loss of life and property due to storm and earthquake-triggered slides over the past few years.

The LIHA provides for a state-local cooperative mapping program to identify landslide-prone areas in the path of urbanization. The Act requires the Director of the Department of Conservation to establish within the Division of Mines and Geology a Landslide Hazard Identification program that is charged with developing maps of landslide hazards within urban and urbanizing areas of the State. Mapping of these areas by DMG is directed by priorities and guidelines established by the Board. The program, originally scheduled for sunset in 1985, was extended until January 1, 1995 by AB 2903 (Chapter 394, 1988 Statutes).

DMG's Landslide Hazard Identification Project (LHIP) attempts to reduce landslide hazards and prevent or reduce property losses in developing areas by preparing maps of areas subject to such hazards. Some of the factors considered in prioritizing areas for landslide mapping include:

- Requests from local government officials/agencies for landslide maps to help them prepare planning documents, especially revision of the Safety Elements of the General Plans.
- Location in a region where there are exceptional development pressures due to rapid population growth.
- Knowledge of geologic framework (related to slope stability) and experience of each LHIP staff geologist with landslide mapping in adjacent areas (previous projects that can be built upon efficiently).

Guidelines for the implementation of the Landslide Hazard Identification Act were developed by the Board based on recommendations from the Board's Geohazards Committee. In 1990, the Board's Geohazards Committee and DMG convened an ad hoc committee of local government planners, geologists and geotechnical experts to evaluate LHIP map products and mapping procedures. Determinations made by the ad hoc committee included an increase in public awareness of the maps and the amount of maps published.

The criteria that must be considered in prioritizing the areas to be mapped are specifically itemized by LHIA (PRC Section 2685). Mapping priorities must address the severity of the hazard, the commitment of local government to share the costs of doing the mapping, the existence of useful landslide data, and the need for more information on landslide hazards to support local mitigation programs.

Areas identified and studied in 1990 are depicted on Figure 3.

Landslide Hazard Identification Program

LANDSLIDE HAZARD IDENTIFICATION MAPS

● Released as Open-File Reports through 1991

1. Petaluma Dairy Belt
2. W/2 Newhall Quadrangle
3. Parts of Diablo & Dublin Quads.
4. Encinitas Quadrangle
5. E/2 Val Verde Quadrangle
6. Rancho Santa Fe Quadrangle
7. E/2 Newhall Quadrangle
8. Benecia/Vallejo Area
10. N/2 Oat Mountain Quadrangle
11. S/2 Fairfield Quadrangle
12. Puente/San Jose Hills Area
13. Cordelia/Vallejo Area
14. Vacaville and Vicinity
15. Lake Arrowhead/Big Bear Lake
16. Clear Lake and Vicinity
18. Yucaipa/Forest Falls Quadrangles
19. Cache Creek and Vicinity
20. N/2 Calabasas Quadrangle
21. Livermore Valley and Vicinity
22. Simi Valley Area

▲ Projects in Progress or Initiated in 1991

9. SE/4 Whitaker Peak Quadrangle
17. N/2 Black Star Canyon Quadrangle
24. City of Ukiah
25. El Cajon Quadrangle and Vicinity
26. Moorpark/Santa Paula Quadrangles
27. Tassajara/Byron Hot Springs Quadrangles
28. Western San Diego County
29. Northern San Benito County

SC Map of Earthquake-Generated Landslides, Santa Cruz Mountains

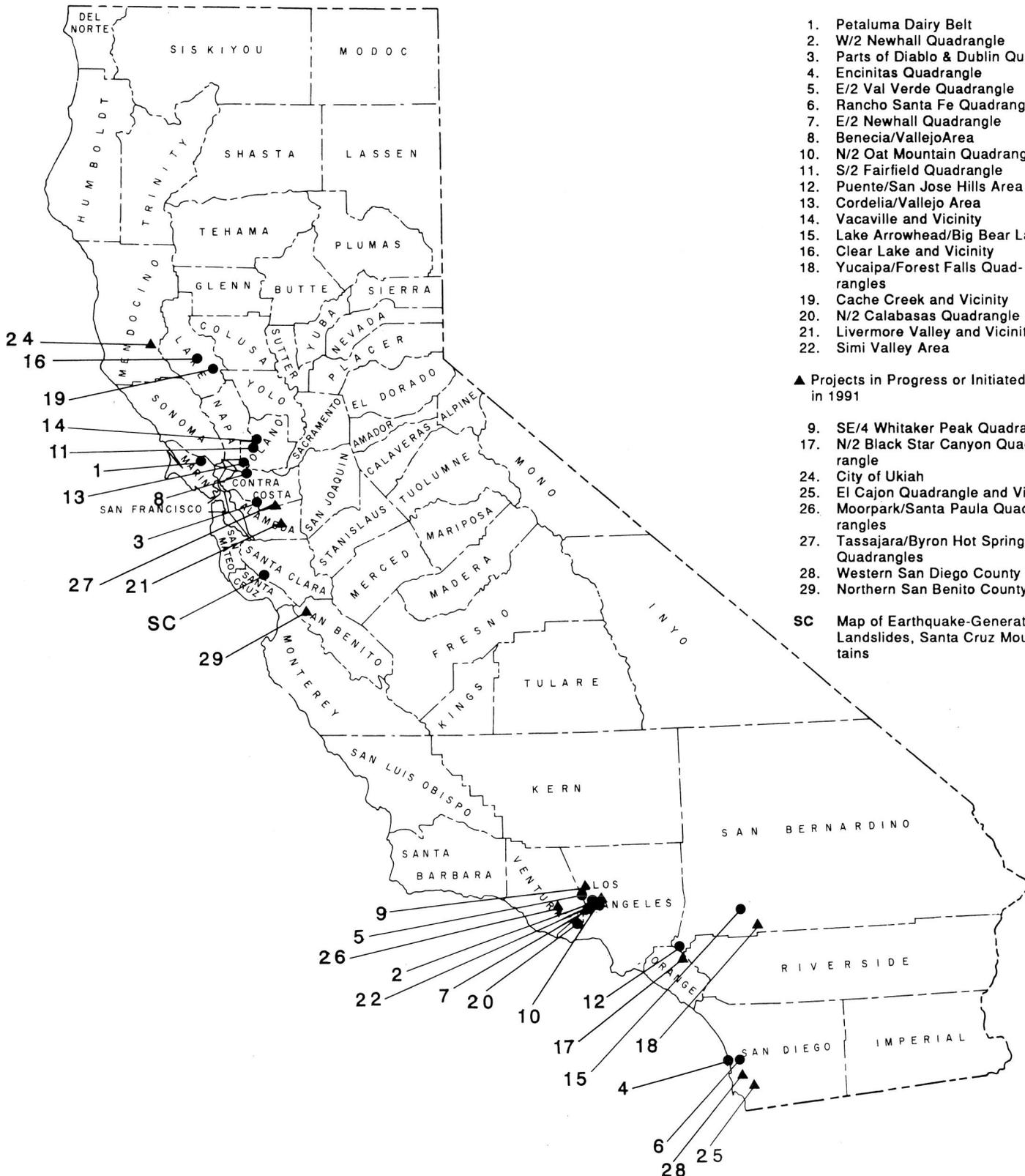


Figure 3. Status of Landslide Mapping Projects.

3. The Seismic Hazards Mapping Act

The recently enacted Seismic Hazards Mapping Act (AB 3897 [Brown], Chapter 1168, Statutes of 1990), created a statewide seismic hazards mapping and technical advisory program to assist cities and counties in fulfilling their responsibilities for protecting the public health and safety from the effects of strong ground shaking, liquefaction or other ground failure, landslides, and other seismic hazards caused by earthquakes. Specifically, the Act requires the delineation of seismic hazard zones, and the disclosure to prospective buyers of the areas located in seismic hazard zones.

Under the new program, the Board is required on or before January 1, 1992, to adopt: guidelines and priorities for mapping seismic hazard zones; policies and criteria for local and State agencies' responsibilities in mapping seismic hazard zones; guidelines for evaluating seismic hazards and recommending mitigation measures; and procedures for waiving the requirement for a geotechnical report where studies conclude that no seismic hazard exists. The Board, in carrying out these responsibilities, consulted with the State Geologist, the Seismic Safety Commission, and other concerned governmental agencies.



Claudia Hallstrom, Geologic Aid with the Division of Mines and Geology, is shown here pouring a concrete slab on which a T-Hut would be mounted to house various seismic instruments. This T-Hut is located at the Vermillion Dam at Thomas Edison Lake. Photo by Rich McJunkin, Division of Mines and Geology.

As required by the Act, the Board appointed, in consultation with the Seismic Safety Commission, an eight-member select committee of seismic experts for the purpose of developing the criteria and guidelines for the preparation of seismic hazards maps. The Board and Committee participated in several workshops involving the development of the mandated program, including the development of the proposed seismic hazards mapping regulations. The Committee is composed of Bruce R. Clark, Leighton & Associates, Inc., Chairman; Robert D. Darragh and Allan Porush, Dames & Moore; J. Carl Stepp, Electric Power Research Institute; Paul Flores, Director of the Southern California Earthquake Preparedness Project; Kenneth R. Blackman, Santa Rosa City Manager; Dianne Guzman, Planning Director for the City of Santa Cruz; and Richard Clinton, Fireman's Fund Insurance Company.

On February 20 - 21, 1991, the Board, in conjunction with DMG, the Seismic Safety Commission, and the United States Geological Survey sponsored a workshop in Marshall, California. The purpose of the workshop was to identify appropriate procedures for mapping zones where earthquake ground failure or enhanced ground shaking may occur. Over 45 seismologists, geologists, and engineers attended the two-day workshop.

The Board's Seismic Hazards Committee, together with the Advisory Committee, and staff representatives from the Board and DMG, met on March 20, 1991 in Sacramento to begin discussions on possible criteria for use in developing the Act's mandated guidelines. They met again in April to further its discussions on possible criteria and to review a draft set of guidelines for the zoning of potential sites in which liquefaction may occur. On May 24, 1991, they met to review the draft regulations prepared pursuant to the Act by the Board, and discuss the status and contents of guidelines which were prepared to accompany the proposed regulations. Their recommendations were forwarded to the Board for its review and approval.

The Board held a public hearing, following a 90-day review period, on September 13, 1991, which provided the opportunity to present statements, arguments, and written materials relevant to the proposed regulations. The Board anticipates that the regulations will be adopted, pursuant to the regulatory process required by the Administrative Procedure Act, by January 1, 1992. The Board will however, periodically review priorities for mapping and will accept public comment on seismic zoning maps as they are drafted.