

MINUTES

MONTANA HOUSE OF REPRESENTATIVES 53rd LEGISLATURE - REGULAR SESSION

JOINT SUBCOMMITTEE ON EDUCATION & CULTURAL RESOURCES

Call to Order: By Chairman Royal Johnson, on January 19, 1993,
at 8:00 a.m.

ROLL CALL

Members Present:

Rep. Royal Johnson, Chair (R)
Sen. Don Bianchi, Vice Chair (D)
Rep. Mike Kadas (D)
Sen. Dennis Nathe (R)
Rep. Ray Peck (D)
Sen. Chuck Swysgood (R)

Members Excused: none

Members Absent: none

Staff Present: Taryn Purdy, Legislative Fiscal Analyst
Skip Culver, Legislative Fiscal Analyst
Doug Schmitz, Office of Budget & Program Planning
Amy Carlson, Office of Budget & Program Planning
Curt Nichols, Office of Budget & Program Planning
Jacqueline Brehe, Committee Secretary

Please Note: These are summary minutes. Testimony and
discussion are paraphrased and condensed.

Committee Business Summary:

Hearing: BUREAU OF MINES AND GEOLOGY AND FOREST
AND CONSERVATION EXPERIMENT STATION
Executive Action: NONE

HEARING ON BUREAU OF MINES AND GEOLOGY

Tape No. 1:A:000

Informational Testimony:

Lindsay Norman, President of Montana Tech, began his presentation saying that the request for the 1995 biennium was the most modest and most restrictive in his seven-year tenure. He stressed that the bureau was the principal source of geologic and hydrologic data in Montana and the only earth science agency in state government or the university system which was specifically charged with collecting such data and disseminating it to the public. He noted the advisory services of the bureau were

public. He noted the advisory services of the bureau were utilized by other state agencies, by the public, by local and county governments and by industries and businesses considering moving to the state. Bureau scientists were involved with 50 different projects in Montana.

Dr. Norman reported that the actual unrestricted general fund for FY92 was \$1.36 million, and for the current fiscal year \$1.32 million. These figures included \$43,500 and \$46,200 over the biennium from special revenue funds which the bureau received from the sale of maps and publications to the general public. Tuition revenue enhancements did not benefit the bureau. The bureau requested that the committee approve a budget that would maintain services at the FY93 level.

Edward Ruppel, Director and State Geologist, gave written testimony reviewing the history of the bureau, describing the projects the agency was undertaking, previewing the efforts of the bureau for the next biennium and explaining the budgetary needs. **EXHIBIT 1** Within his testimony he noted that the bureau currently had 26.8 FTEs with an additional 22 people who were on restricted funds and on contract with other agencies. He added that the bureau published 40 reports last year and responded to 12,000 inquiries regarding hydrologic or geologic issues. He pointed out that the bureau's analytical lab was remodeled last year. A Perkin Elmer Mass Spectrometer was obtained through a lease/purchase agreement and would be paid for with funding from indirect costs. He stressed the lab was self-supporting.

Tape No 1:B:120

Questions from the Subcommittee and Responses:

REP. RAY PECK asked how budgetary reductions could cause the bureau to default on its contracts. **Dr. Ruppel** replied that a major reduction would result in layoffs. Since almost everyone was working on projects in which some matching funds were involved, some projects could not be finished resulting in default. Most projects were funded through a one-to-one match. Some had a more favorable ratio of 33% state funds to 66% outside funds.

In response to **REP. PECK'S** question concerning the status of groundwater, **Dr. Ruppel** explained that there were two parts to the issue. The first part involved the groundwater program the bureau was presently directing with 35 separate projects spread across Montana, examining water quality and agrichemical contamination. He said the second issue revolved around SB 94 which directed restricted funds to come from RIT proceeds to a maximum of \$666,000 per year for groundwater quality assessment. He felt this issue involved certain complications that should be discussed separately from the budget.

REP. PECK asked for more information on the problem of

agrichemicals contaminating Montana groundwater. **Wayne VanVoast**, Chief of Research at the Bureau of Mines, explained that the bureau had several projects in eastern Montana and they had been finding reportable pesticide contamination in the groundwater in some areas. Pesticides did biodegrade rapidly, but only where there was oxygen such as in surface water. They did not biodegrade in groundwater. The problem was that once in ground water, the pesticides could travel long distances.

REP. PECK asked if the Indian water rights negotiations which were presently occurring were placing any extra burden on the bureau. **Mr. VanVoast** said there were a few calls but it was not an extra burden. **REP. PECK** referred to page 4 of **EXHIBIT 1** and asked how the bureau managed to purchase new equipment in light of the financial restraints placed on it. **Dr. Ruppel** replied that the bureau had been able to attract grants which provided for purchase of equipment and some which provided for indirect costs which were utilized to purchase instruments that enhanced the bureau's research capability. He noted that the research lab was so antiquated, it had to be remodeled or shut down. He said he was aware that it gave the appearance of a conflict to be purchasing equipment while having state appropriated funds reduced.

Dr. Norman stated that the bureau was entrepreneurial and effective at obtaining matching grants which enabled them to purchase equipment. He added the state needed to be cautious that outside funding did not reach the point of driving the programs of the agency. He said it was important to maintain funding to the bureau because so much of its work was done for other state agencies. When there were budget cuts in other agencies, those reductions impacted revenue for the bureau, much like a domino effect. A certain level of state support was needed to insure that state problems were worked on rather than outside funding determining entirely the efforts of the bureau.

SEN. DON BIANCHI asked if it were true that the bureau came to the committee two years ago with a modification for \$600,000 to purchase the spectrophotometer and other equipment and the committee directed the bureau to proceed with the purchase on a lease/purchase basis. **Dr. Ruppel** replied that a budget modification was submitted during the last regular session and the bureau went ahead as directed with the lease/purchase when the mod failed. He noted that additional equipment was still needed to bring the lab up to current standards. **SEN. BIANCHI** noted that the legislature did direct the bureau not to shut the lab down and to pursue other alternatives for equipment purchase.

CHAIRMAN ROYAL JOHNSON asked if the bureau worked on a twelve-month basis or if it followed the school year. **Dr. Ruppel** noted that all the professional staff were on twelve-month contracts. **CHAIRMAN JOHNSON** asked what the total budget for the bureau was including outside funding in 1983 as compared to the present. **Dr. Ruppel** replied that relatively little outside work was being

done in 1983. Currently, the bureau was approaching \$1 million in outside contract work. The outside contracts almost doubled the budget. **John Dunston, MBMG**, noted that with outside contracts the total annual budget of the bureau came to \$2.4 million. He added there were no other monies coming to the bureau other than general fund and outside contracts.

CHAIRMAN JOHNSON noted that **Dr. Ruppel** had spoken of hiring an additional staff member to initiate a new program and wondered, in considering the financial climate, if that was a wise decision. **Dr. Ruppel** explained that the position was that of a geographic information systems (GIS) specialist. He noted that GIS capabilities needed to be added because of the requirements of the agencies coming to them with contracts. Digital format and map format from a computer was being demanded. He noted that the U.S. Geologic Survey had informed the bureau that in the next two years they will require all the maps supplied to them be in the GIS format.

CHAIRMAN JOHNSON asked where the agency would apply reductions if the legislature gave them the same amount of funding as in the last session or if that funding were reduced. **Dr. Ruppel** said that if the funding level remained the same, the contracts would remain the same and they would proceed with the hiring of the individual on soft dollars (contract work). He said if the funding were reduced significantly (\$20-40,000), the bureau would not hire a GIS specialist. In addition, the bureau would have to lay off personnel who were paid by appropriation money. Since all personnel worked on contracts, it would mean that the bureau would begin defaulting on those contracts. If those defaulted contracts were supplying major support for the analytical lab, the lab might need to be closed or the mass spectrophotometer be returned.

SEN. DENNIS NATHE requested **Marvin Miller** explain item 10 on page 3 of **EXHIBIT 1**. He noted the money for the Poplar River monitoring had been appropriated to DNRC and that DNRC contracted the work to the Bureau of Mines. With the five percent personal services reduction called for by the legislature, the DNRC eliminated this contract with the bureau. **Marvin Miller, MBMG**, said the project was an ongoing one which was in its twelfth year. He noted that it started as an international joint commission whose purpose was to monitor the impact of the coal-fire generator located across the border in Saskatchewan, Canada. During the last few bienniums, the money for the project had been appropriated to the DNRC which subcontracted to the bureau. He noted that Canada had 250 monitoring wells on its side of the border while Montana had 15. The importance of the project was the annual review of the data with Canada to insure the continued monitoring of water on the Canadian side so that contamination of the Montana aquifer did not occur. He added that \$36,000 had been appropriated over the last biennium for the program.

SEN. TOM BECK, District 24, Deer Lodge, noted that he was the

principal sponsor of SB 94 in the last session. He stressed the importance of the groundwater monitoring program especially in eastern Montana. He noted that the DNRC wanted to take appropriated money for surface water monitoring and said it was important to stay with the groundwater monitoring as the chief priority.

Taryn Purdy, LFA, distributed and reviewed **EXHIBIT 2** which was a comparison of the LFA and executive current level budget and **EXHIBIT 3**, which was an addendum covering additional issues. She noted that there were few differences between the LFA and the executive current level. The LFA maintained the assumption of a certain income level from the sale of maps and publications (\$44,000 per year). She referred the committee to the second page of **EXHIBIT 3** which dealt with the use of RIT funds. She noted that the language of SB 94 did not constitute a statutory appropriation so that the legislature needed to add spending authority.

Ms. Purdy explained that there were two options available to the committee to add authority to spend the \$666,000 of RIT authorized to the bureau in SB 94. The first was to determine an anticipated amount that would go into the account, which in 1994 would be \$666,000. The second option would be a statutory appropriation bill proper.

REP. PECK asked if \$666,000 was the ultimate level the account could reach. **Ms. Purdy** explained that the account was entitled to 14.1% of the RIT proceeds in 1994 and 1995, which were anticipated to be over \$660,000 in 1994. When the cash balance in the account reaches \$666,000, no more funds would be deposited. If the entire amount was expended, the following year another \$666,000 would be deposited.

REP. MIKE KADAS asked what the anticipated annual expenditure from the account would be. **Dr. Ruppel** answered that \$666,000 was the anticipated annual expenditure. SB 94 established a long term groundwater assessment program which will extend for 21 years. The state would be divided into 21 regions with a new region being added to the study each year. **REP. KADAS** asked if the full \$666,000 would be spent the first year. **Dr. Ruppel** said that because of the first year of implementation, the entire \$666,000 would probably be spent. **Mr. Dunston** added that if only \$300,000 of the \$666,000 was spent during one year, then only \$300,000 would be added to the account the following year. The account had an upper limit of \$666,000 for any year. **Ms. Purdy** concurred with his interpretation.

REP. PECK observed that SB 94 had not made the appropriation appropriately. **REP. KADAS** remarked that the passage of the bill would not have an effect on the general fund. **Ms. Purdy** said it would affect the amount of money available to other programs receiving funding from RIT interest funds, as diverting funds which would have been deposited to the trust will slightly lower

interest available. **REP. PECK** asked if the program were ready to begin next year. **Dr. Ruppel** said yes.

Dr. Norman noted that he had instructed **Dr. Ruppel** not to initiate the project unless the funding was available. However, once the funding was committed, the bureau was ready to start.

Mr. Miller explained the effect of the passage of SB 94 on the RIT account. He said it would delay the account reaching the statutory cap, at which any RIT tax collections would be available for expenditure, by 146 days. **SEN. BIANCHI** asked why the money was not appropriated when the bill was first introduced. **Dr. Ruppel** stated that two years ago new fees were established in the DNRC and those fees were set aside for the bureau to start planning of the groundwater assessment program and monitoring program. The legislature recognized that the full funding of the program could not be utilized immediately. A steering committee was established to lay the groundwork and initiate the planning stage. He noted that the planning had been long and careful and all plans had been approved under the guidance of the multi-agency steering committee.

SEN. BIANCHI asked for more information concerning the request of the DNRC. **Dr. Ruppel** said that after this fiscal year DNRC would only be involved as part of the steering committee. This year the DNRC had proposed that, starting next year, between \$30,000 and \$50,000 be taken out of the groundwater assessment account and used for surface water monitoring. The steering committee was strongly opposed to the suggestion. The intent of the legislation was that it be used for the assessment of groundwater only.

SEN. BIANCHI said **Dr. Ruppel** was correct in his assessment of the legislature's intent. He asked for clarification regarding the committee's action on the issue. **Ms. Purdy** explained that the committee could appropriate the funds to the bureau for the purpose of the operation. Statute already provided the authorization to the bureau to expend the funds. She said the question was whether the bureau had the proper appropriation authority.

REP. PECK asked for clarification on the status of the fees which were being used. **Ms. Purdy** explained that the portion of the law establishing the fees was only in effect for this biennium. In the 1993 biennium, a portion of the application filing fee for a permit to beneficially use groundwater was put into the account. A portion of other fees was also placed in the account to be used by the bureau. This allocation would stop July 1, 1993. **Mr. Dunston** added that about \$100,000 had gone into the account of which \$70,000 had been expended.

Deborah Schmidt, Executive Director, Environmental Quality Council, submitted a letter in support of the Groundwater Assessment Act. **EXHIBIT 4** She explained that in 1991 the

legislature utilized the fees as a funding mechanism in order to give the bureau a chance to establish the planning process before the funding appropriation went into effect July 1, 1993. It would also allow the legislature a second chance to determine whether it wished to undertake this long-term program. She stressed the importance to the economy of the state for Montana to have an understanding of its groundwater resources which SB 94 will provide.

Ms. Schmidt discussed the design and establishment of the steering committee which had representatives of all the agencies having an interest in groundwater. The money would be allocated to the bureau, but the steering committee would be integrally involved in planning the expenditures. She reiterated the importance of the project to the future of Montana.

REP. KADAS noted that if it were the intent of the 1991 legislature to have the plan brought back to the legislature for approval, then a more detailed hearing would be in order. **Ms. Schmidt** said a more detailed hearing would be an excellent idea and mentioned that the funding mechanism did go into effect automatically. She added that before the committee recommended spending authority for such a long range project, a hearing would be helpful. She noted that **REP. BOB GILBERT** had requested the drafting of a bill for spending authority for the program if the committee deemed it necessary to have one. **REP. PECK** agreed with **REP. KADAS** that a hearing was needed. **CHAIRMAN JOHNSON** noted that with a bill being introduced, the normal mechanism for a hearing would proceed. **REP. KADAS** said that a hearing before the committee should occur since the committee was being assigned the task of reviewing the project from the last legislature.

SEN. BIANCHI referred to **EXHIBIT 5** which listed current statutes and noted that the funds would be deposited in the account automatically unless the law was changed. **Ms. Schmidt** concurred, noting that a bill could pass repealing the RIT tax which would affect the funding. **SEN. BIANCHI** stated that the money would be in the account but the task that remained was to give the bureau authority to spend it. He said the hearing should not focus on whether to change the law, but whether to give the bureau the spending authority. **Ms. Schmidt** commented that she believed it was the intent of the legislature to have the program reviewed.

CHAIRMAN JOHNSON asked **Ms. Schmidt** if the bill she was drafting for **REP. GILBERT** was the appropriate format to ascertain whether the legislature wished to continue the program. **Ms. Schmidt** said that it was one option. She said there was also a policy question of whether the committee wanted to look at the issue every biennium to insure the money was being spent properly.

CHAIRMAN JOHNSON asked **Mr. Dunston** if the \$666,000 would affect the \$1 million now being received by the bureau from outside sources. **Mr. Dunston** replied that it would not affect the outside contracts because additional people would be hired for

the project. It would increase outside funding by 60%.

REP. PECK asked if the project gave the bureau greater potential for receiving additional grants. Mr. Dunston was not sure of that possibility.

Tape No. 2:B:000

REP. KADAS requested the bureau prepare a biennial budget for this project and describe how the \$666,000 would be spent. Dr. Ruppel said a biennial budget had been prepared and would be supplied to the committee. SEN. BIANCHI asked that DNRC come before the committee and explain why they believe they should have the authority to spend \$50,000 of the funds for surface water monitoring.

CHAIRMAN JOHNSON closed the hearing on the Bureau of Mines and Geology.

HEARING ON FOREST AND CONSERVATION EXPERIMENT STATION

Tape No. 2:B:45

Informational Testimony :

George Dennison, President, University of Montana, distributed EXHIBIT 6 and referred to it as he explained the mission, program goals, program objectives and appropriation requests for FY94 and FY95. He noted that when the recision occurred in FY92 and FY93, they were taken without affecting the operational budget of the station. He said that approximately \$700,000 was appropriated for the station with an additional \$1.4 million generated through the research activity of the staff for a total budget of \$2.1 million per year. He said the general fund monies were used as leverage to attract additional money to fund the work of the station.

Sid Frissell, UofM and Forest and Conservation Experiment Station (FCES), described a few of the 101 research projects carried out at the FCES. He said some of the work at the station was traditional research in that data was collected, interpreted and disseminated. In addition, demonstration areas were developed where landowners and forest managers could see the results of the research. The first research project he described was one which collected numbers from satellite imagery to research the earth's resources. The project attracted \$10 million from NASA in 1986. The second area of research discussed was the geographic information systems (GIS) laboratory which used computers to store map information and allow the comparison and analysis of the data on the maps for urban planning and forest management, among other uses.

EXHIBITS 7 and 8 were distributed to the committee. Dr. Frissell noted the number of cooperating agencies and organizations working with FCES, as well as the number of private

organizations, **EXHIBIT 8**, and described several of the projects. He pointed out the success the station had in obtaining outside grants and explained that it was due to the high quality of research being carried out. The attraction of outside funding was dependent on continued support from the state which paid the salaries of the researchers who were all faculty members. In addition, many federal grants were dependent on receiving state support.

Dr. Dennison reviewed page 6 of **EXHIBIT 6** which indicated the Board of Regents' budget request for the FCES, the executive proposal and the LFA proposal. He referred the committee to page 7 of the same exhibit which gave three snapshots of the RERS report for the FCES. He added that the biggest difference in the three proposals on page 6 was in the area of salaries. Page 8 gave a detailed listing of the equipment budget while page 10 detailed the nature of the equipment requested. He directed the committee's attention to the last two pages of **EXHIBIT 6** which described the grant activity for FCES.

Questions, Responses, and Discussion:

SEN. DENNIS NATHE asked if the impact of the loss of high-paying jobs in the Missoula area was factored into some of the economic studies at the FCES. He noted that jobs in the wood products industry were being replaced by lower-paying jobs in the tourist industry. **Dr. Frissell** agreed that tourist jobs were lower-paying and gave some details of the nature of the economic studies undertaken at FCES. **Dr. Dennison** noted that a project, funded by the Small Business Administration, was examining the value-added products of the timber industry and how to stimulate activity in this area. **SEN. NATHE** said that a service economy was not a thriving economy. A thriving economy required high-paying, blue-collar jobs.

REP. KADAS requested more information on the personal services line in the budget. **Dr. Dennison** restated that the difference between the three proposals on page 6 of **EXHIBIT 6** was confined to the personal services line. He said the reason for the difference was that the Regents' proposal was based on a RERS run in January which had the salary increases for FY93 and the correct allocations for benefits. **Ms. Purdy** gave some background information saying that both the OBPP and the LFA proposals were based on an October RERS run. Subsequently, it was learned that there were problems with the run including inaccurate benefit data. In December a request was made for another run which was the January run described by **Dr. Dennison**. This run was based on the actual employees and salaries in 1993, rather than the figures for the end of 1992. The issue for the committee was whether to use the October RERS run of 1992 data or use the January 1993 RERS run with updated data. She added that this decision would have to be made again for the other agencies associated with the university system and using the RERS system.

REP. KADAS inquired why there was not much of a difference in the proposals for the Bureau of Mines budget. Ms. Purdy explained that usually the LFA and the executive use the October RERS run. In the case of the FCES, the agency request was incorporated into the executive budget. In the case of the Bureau of Mines there was very little difference between the two RERS runs. Curt Nichols, OBPP, noted that this was the first time the RERS system was being used and as such there were problems with the first few runs. He suggested the January RERS run be used since it represented the most recent information.

REP. PECK noted that in the text of the LFA Budget Analysis, it stated the OCHE was to supply RERS data in early January. He asked if the OCHE had complied. Ms. Purdy said all the information had been received with the exception of the UofM main campus. The data was incorporated into the addendum.

REP. PECK asked if Montana needed to be involved in research in the forestry area to this extent given the well-supported Canadian research facilities and the activity in surrounding states. Dr. Dennison said the universities should be involved in research in general because of the close relationship between the quality of life and the quality of the universities. Research should occur which was relevant to what was occurring economically in the state. Forestry research was therefore critical. Dr. Frissell added that most of the research done by other universities in the northwest region was directed to the west coast climate. The research being done in Montana was unique. He noted that Canada was coming to Montana researchers to obtain data.

REP. PECK asked if there was a close working relationship with Idaho and Wyoming. Dr. Frissell noted that Wyoming had no forestry school, however, a close working relationship did exist with Idaho. An alliance was being formed with other forestry schools in the northwest region to better coordinate research and avoid duplication. REP. PECK asked what the employment picture was in Montana for the lumber industry. Dr. Frissell explained that employment has gone down and had the potential to drop further. He predicted that the industry would pick up in 10-12 years because of the new growth in heavily forested private lands. He added that small mills might go under because of the lack of efficiency.

CHAIRMAN JOHNSON noted that the FCES staff worked on a school calendar year. He asked how some of the summer projects were accomplished. Dr. Frissell explained that state funding paid for salaries of the researchers during the school year when much data analysis was done. The field work occurred during the summer when salaries were paid from research grants and contracts. He added that most researchers were faculty members, but there were six FTE who had 12-month contracts.

ADJOURNMENT

Adjournment: 11:00 a.m.



REP. ROYAL JOHNSON, Chair



JACQUELINE BREHE, Secretary

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HOUSE OF REPRESENTATIVES

EDUCATION

SUB-COMMITTEE

ROLL CALL

DATE

1-19-43

NAME	PRESENT	ABSENT	EXCUSED
REP. ROYAL JOHNSON, CHAIRMAN	✓		
SEN. DON BIANCHI, VICE CHAIRMAN	✓		
REP. MIKE KADAS	✓	+	
SEN. DENNIS NATHE	✓	-	
REP. RAY PECK	✓		
SEN. CHUCK SWYSGOOD	✓		

EXHIBIT 1
DATE 1-19-93
SB _____

**Testimony to the
Education Subcommittee
on the
Montana Bureau of Mines and Geology**

**by
Edward T. Ruppel
Director and State Geologist**

MONTANA BUREAU OF MINES AND GEOLOGY

The Montana Bureau of Mines and Geology is the principal source of geologic and hydrologic data in Montana, and the only earth-science agency in the State government and the University System that is specifically charged with collecting such data and disseminating it to the public.

The Bureau provides extensive advisory, technical and informational services on the geology, mineral, energy, and water resources of Montana. These services are used by a wide range of Montana citizens, by other Montana State agencies, and county and local governments, by federal agencies, and by a large number of out-of-state private citizens and corporations.

In addition, the Montana Bureau of Mines and Geology conducts basic and applied research on regional geology and hydrogeology, mineral and energy resources, earthquakes and related geologic hazards, landslides, ground and surface water resources and water quality, coal hydrogeology, and on other related topics. Many of these studies are conducted in cooperation with other state and federal agencies and with county governments, municipalities, and other local groups. These studies reflect the Bureau's commitment to provide timely and appropriate information on geology, hydrogeology and earth resources.

Highlights of 1991 and 1992

1. Bureau scientists are currently working on about 50 different projects in areas widely distributed across the State, (See attached maps). The subjects of some of these studies include: agricultural chemicals in groundwater; radioactive and toxic materials in groundwater; groundwater sources availability and quality; coal hydrology; coal resources and quality; mineral and energy resources; and geologic hazards, including earthquakes and landslides. Bureau geologists are continuing geologic mapping in many areas, with a primary objective being the preparation of a new State geologic map. Studies of mine flooding and related groundwater contamination continue in the Butte area, as do studies of oil field groundwater contamination, oil field brines, and saline seeps in other regions of the State.
2. The Earthquake Studies Office monitors earthquake activity in seismically-prone southwest Montana through a network of solar-powered remote stations. Data from these stations is telemetered to the Montana Tech campus, and is recorded on newly acquired digital equipment, as well as on revolving paper drums. New computer programs now make rapid calculations of epicenter locations and depths below ground surface and times of origin of local earthquakes. Almost 2,000 earthquakes occurred in Montana in the past two years.

3. About 40 new reports on Bureau investigations were published or released as open-file reports. Bureau scientists and staff also responded each year to almost 12,000 orders, inquiries, and requests for information, including requests for specific hydrologic or geologic information. In addition, Bureau scientists respond to many less formal requests for hydrologic or geologic information when they are working in project areas or attending local or regional meetings. Most requests for information come from Montana residents, but many also come from elsewhere in the United States and from foreign countries. Clearly, service is the Bureau's mission.
4. The Bureau Analytical Laboratory has been extensively remodeled and modernized, and has installed a newly purchased Perkin-Elmer Elan 5000 Inductively Coupled Plasma Mass Spectrometer. With this and other modern, advanced analytical instruments, the laboratory provides unique capabilities to the Bureau and the State. The Bureau and Montana Tech have proposed that a new Analytical Center for Mineral and Hydrogeological Resources be established at Montana Tech to further expand the research and analytical capabilities of the Bureau Laboratory. The new laboratory would provide critically needed highest quality analytical data and research for Bureau scientists and for other scientists in the University System, State and Federal agencies, industry, and the public.
5. Bureau geologists, hydrogeologists, chemists, and engineers began a new and innovative Inactive Mines Assessment Program, a cooperative program with the U.S. Forest Service.
6. Bureau geologists are working with scientists from Princeton University and the U.S. Geological Survey in a cooperative study of the Beaverhead meteor impact site. The site is in Medicine Lodge Creek in southwestern Beaverhead County, and is a remnant of a large impact crater formed about 800 million years ago.
7. The 1991 Groundwater Assessment Act (85-2-902 et seq MCA), one of the most important pieces of ground water legislation ever adopted in Montana, is being systematically planned by Bureau scientists under the policy guidance of a multi-agency steering committee. The ground water monitoring program is started, and the ground water assessment program will begin on July 1, 1993.
8. The Groundwater Information Center, a data file containing information on more than 120,000 Montana wells and more than 6,000 chemical analyses of Montana groundwater, has been entered into Bureau computers, and programs have been

developed to provide for easy and quick access to information on groundwater across the State.

9. Bureau research included geologic and hydrologic studies under cooperative matching agreements with 26 different cooperators, including Federal and State agencies, counties, towns, conservation districts, and others. These cooperative contracts nearly doubled the amount of work that could have been done on State appropriations alone.
10. Bureau hydrogeologists monitor two surface water sites and 20 wells in the Poplar River region, in a continuing study of ground water changes and water quality problems related to coal mining and power generation in Canada. The monitoring has shown no significant changes in water quality, but a declining trend in water levels since 1988.
11. Users of geologic and hydrologic information increasingly need data in digital formats. In recognition of this, the Bureau continues to expand and modernize its computer and GIS capabilities. Because most of the Bureau's work requires precise locations, the Bureau will seek to add Global Positioning System capabilities in the coming Biennium. Bureau GIS and GPS programs will be available to Montana Tech students for instruction in these expanding technologies.
12. In cooperation with other state geological surveys in the Rocky Mountains, Bureau geologists expect to initiate a major reassessment of Montana oil and gas resources.
13. The Bureau staff of 26.8 FTEs is augmented by about 23 additional employees who are paid from restricted funds generated by cooperative matching contracts, to give a total current staff of 49. Of these, 36 are geologists, hydrogeologists, chemists, and engineers, and 13 are supporting technicians and clerical, accounting and other staff. The Bureau staff should also include an economic or mineral resources geologist, to provide more extensive studies of metallic mineral resources than are possible now, and additional hydrogeologists, to permit broader, regional studies of this most important of all Montana resources.

The Bureau is increasingly limited in its ability to respond to new needs and opportunities for studies on Montana mineral and energy resources and groundwater, because the present staff is matched almost to the limit and we cannot seek significant new contracts except as replacements.

DATE 1-19-93
SB _____

**Funding in the
Montana Bureau of Mines and Geology--
A Decade of Losses**

The budget of the Montana Bureau of Mines and Geology has steadily declined for the last ten years, from a high of \$1,558,624 in FY82 to \$1,270,043 in FY93. At the same time, the effects of inflation have even more seriously reduced the buying power of the appropriated funds. The net effect has been a nearly catastrophic budget loss of more than 35 percent in the last decade (Figures 1, 2).

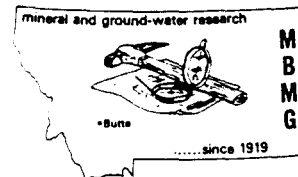
The Bureau has adjusted to this budgetary attrition in a number of ways. The FTE level has been reduced by about 20 percent, the FTE level from about 33 to 26.8. Travel funds and other operational costs have been repeatedly reduced, commonly by as much as 30 percent over the decade. Bureau scientists must travel to all areas of Montana to accomplish their work, however, and minimum levels of operational funds must be maintained. Salary increases have been modest at best, averaging 1.5 to 2 percent per year, far below the levels of inflation. Equipment purchases on appropriated funds have been restricted to those absolutely necessary for performance of Bureau missions.

In spite of these severe losses, the Bureau has retained and enhanced its reputation as a viable, efficient and responsible organization, and as the principal source of geologic and hydrologic information on Montana. The Bureau staff is nationally and internationally recognized for its professional competence and integrity. Because of its reputation for excellence, the agency is successful in attracting contracts with other government agencies, and the dwindling State appropriated funds are almost completely matched in contracts. It is these contracts that have helped the Bureau continue to fulfill its legislatively mandated mission, and to purchase state-of-the-art equipment like the ICP-MS and the radon scintillometer and to retain a uniquely competent professional staff.

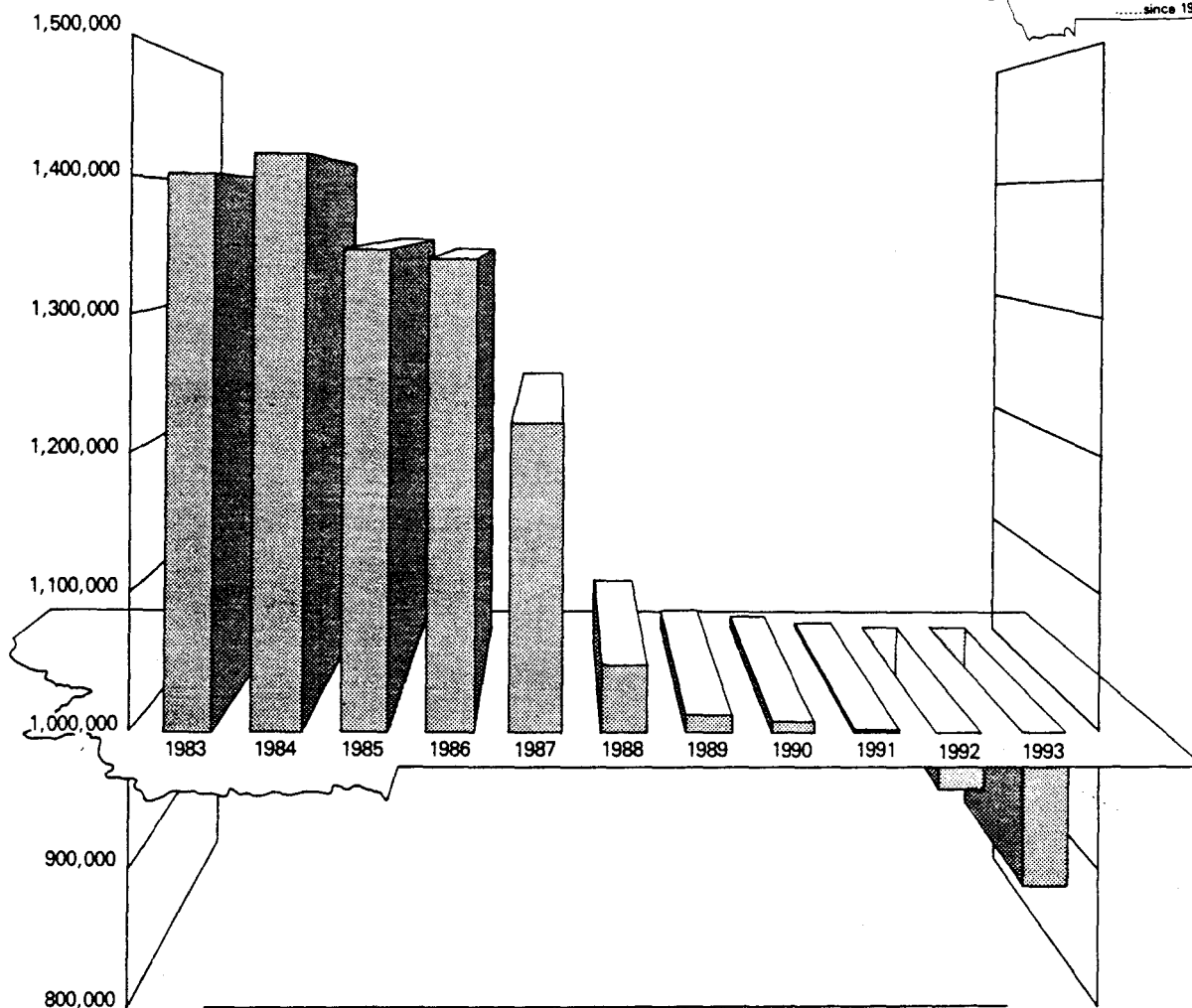
In summary, the Bureau has maintained and enhanced its technical competence and continued to perform its multiple missions through a decade of budget reductions. Further budget reductions will place major Bureau operations in peril, and could seriously damage this dedicated, responsive public service agency. Bureau appropriated funds are so extensively matched that only limited amounts are available for new programs, even though participation in such new programs clearly would be of enormous benefit to the State. Even more seriously, additional cuts in appropriated funds will jeopardize existing contracts; any significant budget reduction will almost certainly lead to defaults on one or more contracts, with consequent collapse of many Bureau operations.

Montana Bureau of Mines and Geology, Funding

Butte and Billings



Allowing for 3% yearly inflation.



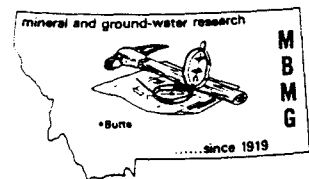
	Actual \$ Funded	3% Yearly Inflation	\$ Funded Allowing For Inflation	% Of Change
FY83	1,402,562	-0-	1,402,562	-0-
FY84	1,456,909	- 3%	1,413,202	+ .8
FY85	1,433,821	- 6%	1,347,792	- 4.6
FY86	1,474,042	- 9%	1,341,387	- .5
FY87	1,390,651	- 12%	1,223,773	- 8.8
FY88	1,232,850	- 15%	1,047,923	- 15.1
FY89	1,233,523	- 18%	1,011,489	- 3.5
FY90	1,274,915	- 21%	1,007,183	- .4
FY91	1,318,925	- 24%	1,002,383	- .5
FY92	1,317,759	- 27%	961,964	- 4.0
FY93	1,270,043	- 30%	889,030	- 8.0

Net decrease for decade is - 36.9%.

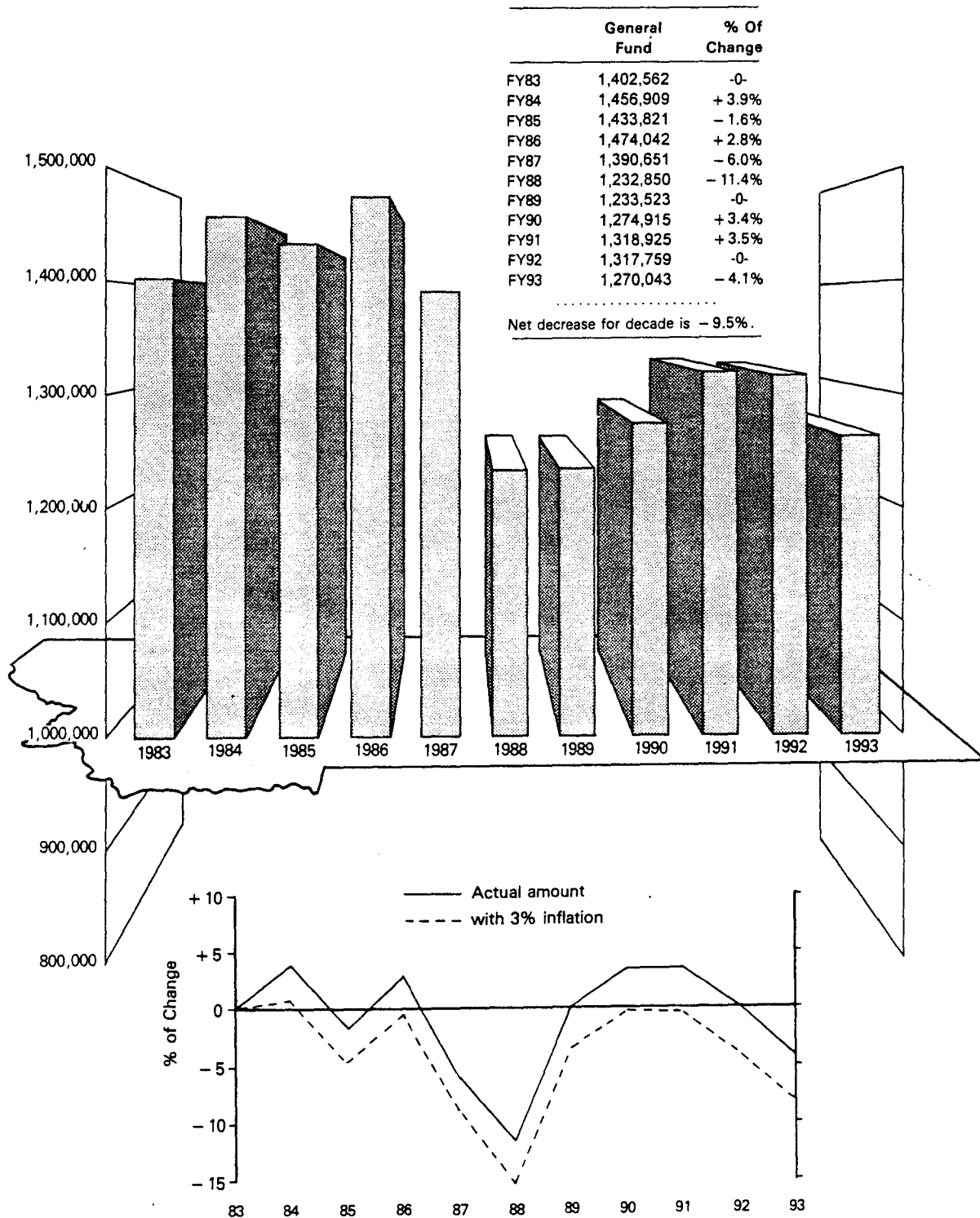
Graph showing decline in Bureau budget, 1983 - 1993 (adjusted for inflation).

Montana Bureau of Mines and Geology, Funding

Butte and Billings



No adjustment for inflation.



Graph showing decline in Bureau budget, 1983 - 1993 (Not adjusted for inflation).

Budget

The actual unrestricted General Fund budget for the Bureau of Mines and Geology for Fiscal Year 1992 was \$1,361,252, and for Fiscal Year 1993 is \$1,316,454. These figures include \$43,493 actual FY92 and \$46,411 budgeted FY93 State Special Revenue, which is anticipated agency generated revenue mainly from sales of maps and publications. They also include \$60,000 per year administrative charges paid by the Bureau to the Montana College of Mineral Science and Technology.

Budgets for the Bureau of Mines and Geology

	Current Year	1993-1994	1994-1995
Regents Budget			
General Fund	\$1,270,043	\$1,405,807	\$1,389,260
State Special	46,411		
Total	\$1,316,454	\$1,405,807	\$1,389,260
Executive Budget			
General Fund	\$1,083,633	\$1,406,171	\$1,394,311
State Special			
Total	\$1,083,633	\$1,406,171	\$1,394,311
Legislative Fiscal Analyst Budget			
General Fund	\$1,295,912	\$1,359,015	\$1,346,095
State Special	46,411	44,000	44,000
Total	\$1,342,323	\$1,403,015	\$1,390,095

The budgets proposed for each of the years of the next biennium do not differ significantly, and will permit the Bureau to continue operations at about the present level.

Geologic Mapping for Montana's Future

Of all of the missions of the Montana Bureau of Mines and Geology, the preparation and understanding of geologic maps is one of the most complex and essential--and one of the least understood. And yet the geology of the State affects every person in the State every day. The need for geologic maps has been recognized by the United States Congress in the Congress in the Geologic Mapping Act of 1992, which states that geologic maps are the primary database for virtually all basic and applied earth science investigations, including:

- 1) Exploration for and development of mineral, energy, and water resources.
- 2) Screening and characterizing sites for toxic and nuclear waste disposal.

- 3) Land use evaluation and planning for environmental protection.
- 4) Earthquake hazards reduction.
- 5) Predicting volcanic hazards.
- 6) Design and construction of infrastructure requirements such as utility lifelines, transportation corridors, and surface-water impoundments.
- 7) Reducing losses from landslides and other ground failures.
- 8) Mitigating effects of costal and stream erosion.
- 9) Siting of critical facilities.
- 10) Basic earth-science research.

Geologic maps show materials at and below the ground surface, showing different kinds of rock, surficial sands and gravels, the distribution of metallic and non-metallic mineral resources, and the ages, composition and distribution of these materials both on the surface and beneath the surface. They are prepared at many scales, depending on the need for detailed information and their anticipated use. The most general map, the geologic map of the State, is at a scale of 1:5000,000, about eight miles to an inch, and is used for regional studies and for locating broad areas favorable for the occurrence of mineral of energy resources, for waste disposal, or areas particularly prone to environmental hazards.

More detailed geologic maps at scales from 1:100,000 (about one inch equals 1.6 miles) to 1:24,000 (one inch equals 2,000 feet) are used for planning and decision making in areas of environmental concern and in areas of vital economic importance where information is required on mineral resources, ground-water availability, and for construction or engineering purposes. These detailed maps are needed by industry in decisions on locating mineral and energy resources and siting facilities and construction projects. Municipal, county, State and federal government agencies need detailed geologic maps for planning purposes and for evaluating competing land uses; selecting safe sites for construction of hospitals and schools; developing zoning regulations; and assessing land values. Private, public, and government groups need detailed geologic maps for the identification, development, and protection of ground-water resources, and to identify and evaluate the potential damage from earthquakes, landslides, shrinking or swelling clays, and other geology-related hazards.

In Montana, the principal source of new geologic maps increasingly is the Montana Bureau of Mines and Geology. The Bureau in cooperation with the U.S. Geological Survey is preparing a new State geologic map, and is actively expanding its program of more detailed geologic mapping to meet the constant requests for more geologic information. At the present time, only about ten percent of the State is covered by geologic maps at scales of 1:63,500 (an inch to the mile) or more detailed scales, and only a small proportion of these are at a scale of 1:24,000, an inch to 2,000 feet. None of the major urban areas in Montana are in regions where the geology has been mapped at scales suitable for urban planning or decision making. None of the many Geographic Information Systems in the State incorporates an adequate base of geologic data, even though that information is of critical importance. The most common request to the Bureau is for more and better detailed geologic maps.

It is abundantly clear that Montana needs an accelerated program of detailed geologic mapping in order to ensure that there are sufficient and protected supplies of ground water; to permit comprehensive assessment of mineral resources including strategic and critical minerals, coal, oil and gas, and industrial mineral resources like sand and gravel, limestone, dolomite and cement rocks, and zeolites; to plan landfill and waste disposal sites; to assess geologic and related hazards, especially earthquake risk and lands, lakes and rock falls in urban areas and in heavily used recreation areas; and to determine the nature of bedrock geology for mineral and oil and gas exploration and development.

The National Geologic Mapping Act of 1992

In May, 1992, the United States Congress passed and the President subsequently signed into law the National Geologic Mapping Act of 1992. This Act recognizes the absolute necessity for geologic maps and current geologic information for most land-use decisions, and establishes a cooperative program between the federal government and the states to support geologic mapping. When fully implemented (in FY 1996) the Act will provide \$25,000,000 each year for matching contracts with state geological surveys.

The National Geologic Mapping Act of 1992 can significantly strengthen the geologic mapping program in the Montana Bureau of Mines and Geology. The present COGEOMAP Cooperative Project with the U.S. Geological Survey to prepare a new State Geologic Map of Montana will be incorporated in the new mapping program, and new geologic studies will be started in areas throughout the State where critical land-use decisions are being made. The new maps will be at scales of 1:24,000 and 1:100,000. State-appropriated funds will be matched with federal funds to the maximum extent possible, and will permit major advances in geologic mapping by

Bureau geologists. The new, accelerated mapping program will provide modern geologic data needed for ground water, mineral and energy resource decisions and development, for environmental decisions, and for thoughtful and appropriate decisions on resource and land-use problems throughout the State.

The Next Biennium

In the next biennium, Bureau geologists will concentrate most of their efforts on geologic studies that will contribute to a new State geologic map, a cooperative project with the U.S. Geological Survey. About one-fourth of the State will be mapped in reconnaissance for the State geologic map project at 1:250,000 scale. In addition, the Home Park Ranch, Spur Mountain and Cirque Lake quadrangles (1:24,000) in southwest Montana will be completed and prepared for publication, and compilation of the of the Lima quadrangle (1:100,000) will be started. The new map will show the major advances made in understanding Montana's geologic framework since 1950, and will be an important tool for finding and developing new sources of minerals, energy resources, and ground water. In addition, it will outline areas of geologic hazards like landslides and earthquakes and areas of environmental concern. A study of the Beaverhead meteor impact site in southwest Montana will be continued in cooperation with the U.S. Geological Survey and Princeton University. Bureau geologists will continue studies of non-metallic and metallic mineral resources and will expand the Inactive Mines Assessment Program into the Helena National Forest. This Assessment Program, a cooperative program with the U.S. Forest Service, was started in the Deer Lodge National Forest in 1992 and utilizes the combined talents of Bureau geologists, hydrogeologists, chemists, and mining engineers. The Staff Engineer will systematically visit operating mines throughout the State, will continue to expand the Montana Mine and Mineral Data System as time and funds permit. The Staff Engineer will publish annual reports on mining and mineral developments in Montana, and will begin publication of a new annual report, Minerals and Montana, that will report on the contributions that the mineral industry makes to local, regional and state-wide economies.

In continuing studies of geology-related hazards, the Earthquake Studies Office will continue to monitor and record earthquakes in the western part of the State. Efforts to expand the Bureau seismic network will be continued at a planned rate of at least one new seismic station per year if funding permits.

Under the Mineral Resources Program the long-term USGS-MBMG cooperative National Coal Resources Data System (NCRDS), the Montana Mine and Mineral Data System, and the Assistance to Small Miners are the principal ongoing information and assistance projects.

Most hydrogeologic research in the Bureau is carried on in cost-sharing cooperative projects with federal and State agencies and other users. In the next biennium, Bureau hydrogeologists will continue to expand the Ground Water Information Center (GWIC) established by the Legislature in 1985, and plan to make the Center more responsive to public needs by distributing ground-water information to water-data users on microprocessor based discs. Establishing continuous funding support for the GWIC is a major objective, so that the water information can be dependably and routinely stored and distributed. Bureau hydrogeologists will continue to help those users who need assistance in interpreting hydrologic data. The Bureau will continue to actively cooperate with the Montana State Library in disseminating water-resources information.

Utilizing the GWIC and Geographic Information System (GIS) technology, scientists in the Hydrology Section can present all information stored in the GWIC on maps or charts. GIS techniques are widely used for land-use planning, resource evaluation, and environmental assessment, and the Bureau continues to expand and strengthen its GIS capabilities.

The 1991 Ground Water Assessment Act (85-2-901 et seq MCA) will be fully funded and implemented in 1993. This far-sighted Act provides for systematic, long-term assessment of Montana ground-water resources, and for characterization and monitoring of these vital resources. The Act is unquestionably one of the most important pieces of ground-water legislation ever adopted in Montana. Bureau scientists administer the Assessment Act under the policy guidance of a steering committee, and in the biennium have been designing and starting the monitoring program and planning and designing the assessment program. In July 1993, a comprehensive plan and schedule will be in place, and the systematic assessment of Montana ground water will begin.

Bureau hydrogeologists will expand their activities addressing the problems of agricultural chemicals (fertilizers and pesticides) and other toxic and radioactive substances in Montana ground water. In addition to studies characterizing the presence of agricultural chemicals in ground water, a program of public information and awareness of well-head protection at chemical storage and handling sites will be continued. This program considers the vulnerability of rural-community water supplies to pollution, and will be intended to reduce the potential of contamination of shallow aquifers.

Studies and monitoring will continue on the distribution and mobility in ground water of soluble salts in coal overburden and mine spoils, and on ground-water quality and movement near surface coal mines. Ultimate goals are determining how quickly soluble salts are removed or stabilized after coal mine reclamation, and on determining local and regional impacts of coal mining on disturbed

or adjacent aquifers. Predictive techniques for water-quality degradation by new mines have been developed from the Bureau's work, and will be used in planning of mining and reclamation to minimize the long-term effects on water.

Numerous local projects on rural-community water supplies will be continued. Because of severe drought and/or increased water needs, many Montana communities are experiencing critical water shortages and have requested assistance from Bureau hydrogeologists. The Bureau will continue to provide information and assistance as needed.

Participation in investigations and monitoring programs in cooperation with the International Joint Commission and other federal agencies will continue.

An evaluation of ground-water development for irrigation that was started in 1989 will continue. This study addresses water quality and quality in abandoned underground coal mines near Roundup, and the feasibility of using the 15,000 acre-feet of mine voids as a vast underground reservoir for storage of irrigation water.

In cooperation with EPA, the State Department of Health and Environmental Sciences, and other organizations, Bureau hydrogeologists are actively involved in several projects relating to potential impacts caused by hard-rock mining and pole treatment industries in the Clark Fork River basin. Projects include: monitoring water levels and geochemical changes in the Berkeley Pit, nearby mine shafts, and adjacent observation wells; evaluating effects of metal loading to Silver Bow Creek and its tributaries as a result of storm runoff and ground-water inflow; investigating the movement of toxic elements in soils damaged by metal-rich irrigation water and/or airborne smelter fall-out; and characterizing the movement, distribution, and removal of pentachlorophenol from contaminated soil and ground water. Long-term monitoring of streams, wells, and shafts, as well as repeated sampling for chemical changes are required to evaluate hydrologic trends and changes. Preliminary results and/or interim reports are anticipated for each of the projects during the next biennium.

Several projects will be continued that relate to hydrologic aspects of petroleum and coal exploration. Among these are a study of oil-field brine contamination of shallow aquifers in Sheridan County, and a project experimenting with new methods to accomplish hydrologically safer plugging of seismic shot holes and coal exploration holes. As with all Bureau water studies, objectives are to develop understanding of the problems, and then to develop means of reclaiming, mitigating, or avoiding future ones.

A cooperative program initiated in 1990 between the Bureau and the Montana Department of State Lands, Reclamation Division, has

been successful and will be continued. Through sharing of manpower, travel and funds, the agencies are cooperatively evaluating hydrologic aspects of mines, permit applications, monitoring programs and reclamation plans.

A project to artificially induce ground-water recharge will continue into the next biennium. In cooperation with the U.S. Bureau of Reclamation and the Montana Department of Natural Resources, Bureau scientists are investigating and experimenting on the Turner-Hogeland bench by utilizing enhanced snow-accumulation and snow-retention measures to recharge a shallow aquifer historically prone to overdrafts from irrigation.

The Bureau and the U.S. Geological Survey have a small, but active ground-water cooperative program in which the USGS, with matching funds from the Bureau, undertakes selected hydrologic investigations and supplements the Bureau's data collection efforts. Current active projects include: stream flow evaluations of Silver Bow Creek in conjunction with Bureau ground-water studies; ground-water monitoring at State-wide key locations; and a study of ground-water occurrence and quality in the Sweet Grass Hills area. The funding level of this cooperative program has been reduced by budget cuts and restoration of funds at least to their earlier level is a major goal.

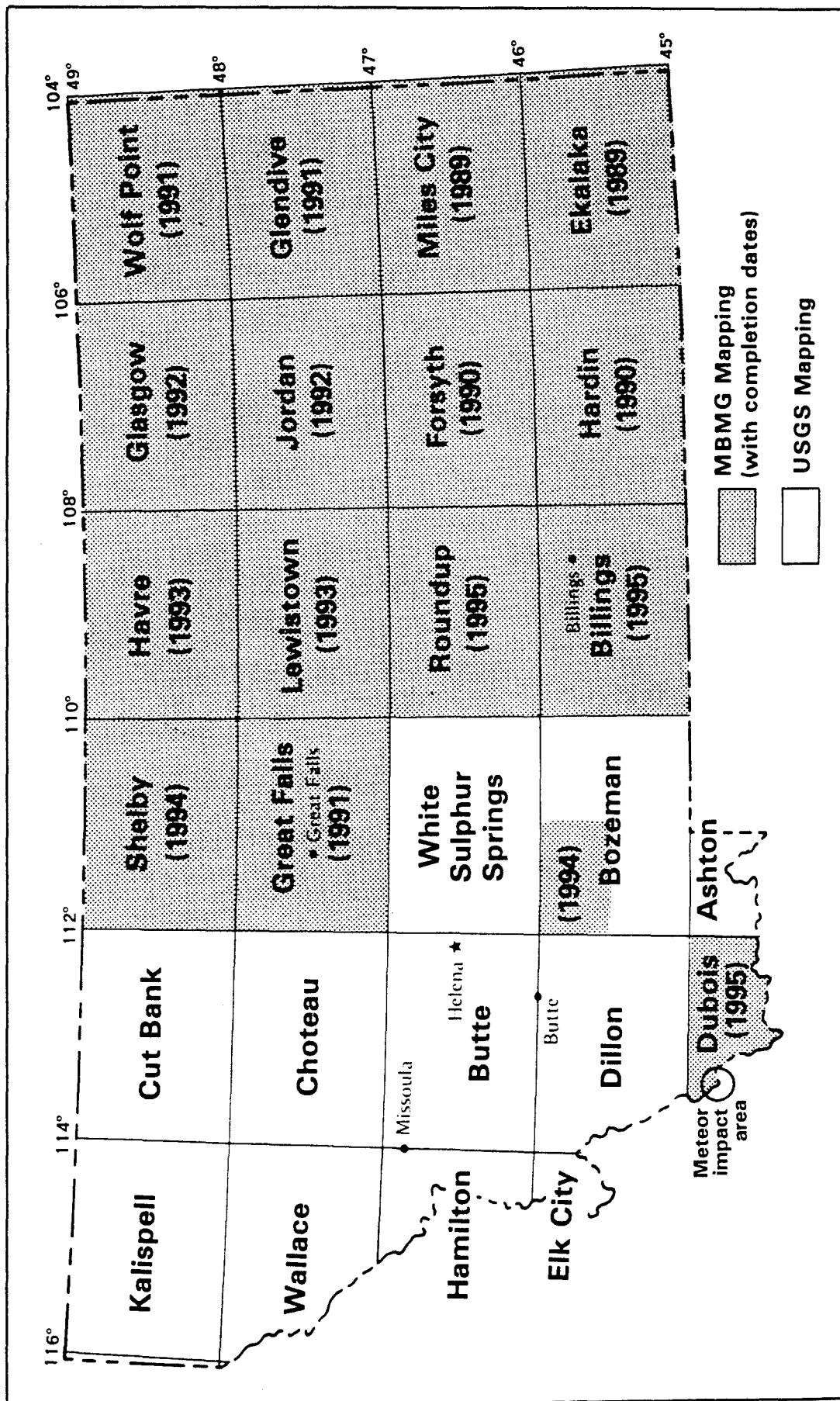
Few of the water-resources projects described above could be accomplished by the Bureau without funding support from the other agencies. Historically, the Hydrology Section has demonstrated competence and responsibility that has attracted such funding. With each progressive biennium, however, these funds become more scarce. A main objective, therefore, during the next biennium will be to secure additional General Fund support that unquestionably will be needed to maintain some of the more important programs, particularly those in environmental hydrogeology including pesticides, agrichemicals and organic chemicals and radioactive substances in ground water, and expanded State support for the Bureau's vital Ground Water Information Center databases on Montana water wells and ground water.

In support of the operating geology and hydrology divisions, the Bureau has acquired Geographic Information System capabilities and will continue the present Memorandum of Understanding with the State Library System to provide current digital geologic and hydrologic data to the State GIS user community. The Bureau has continued to modernize and expand its computer capabilities, and has added a Sun work station to facilitate studies of coal resources and ground-water hydrology. The Bureau recognizes the absolute necessity for supplying both geologic and hydrologic data in digital form and as currently as possible to GIS users throughout the State, and is expanding capabilities for printing computer derived maps. The Bureau expects to add Global Positioning System capabilities to its Geographic Information

System as soon as possible. GPS capabilities are essential to virtually all Bureau field operations, because data acquired without precise locations are potentially misleading.

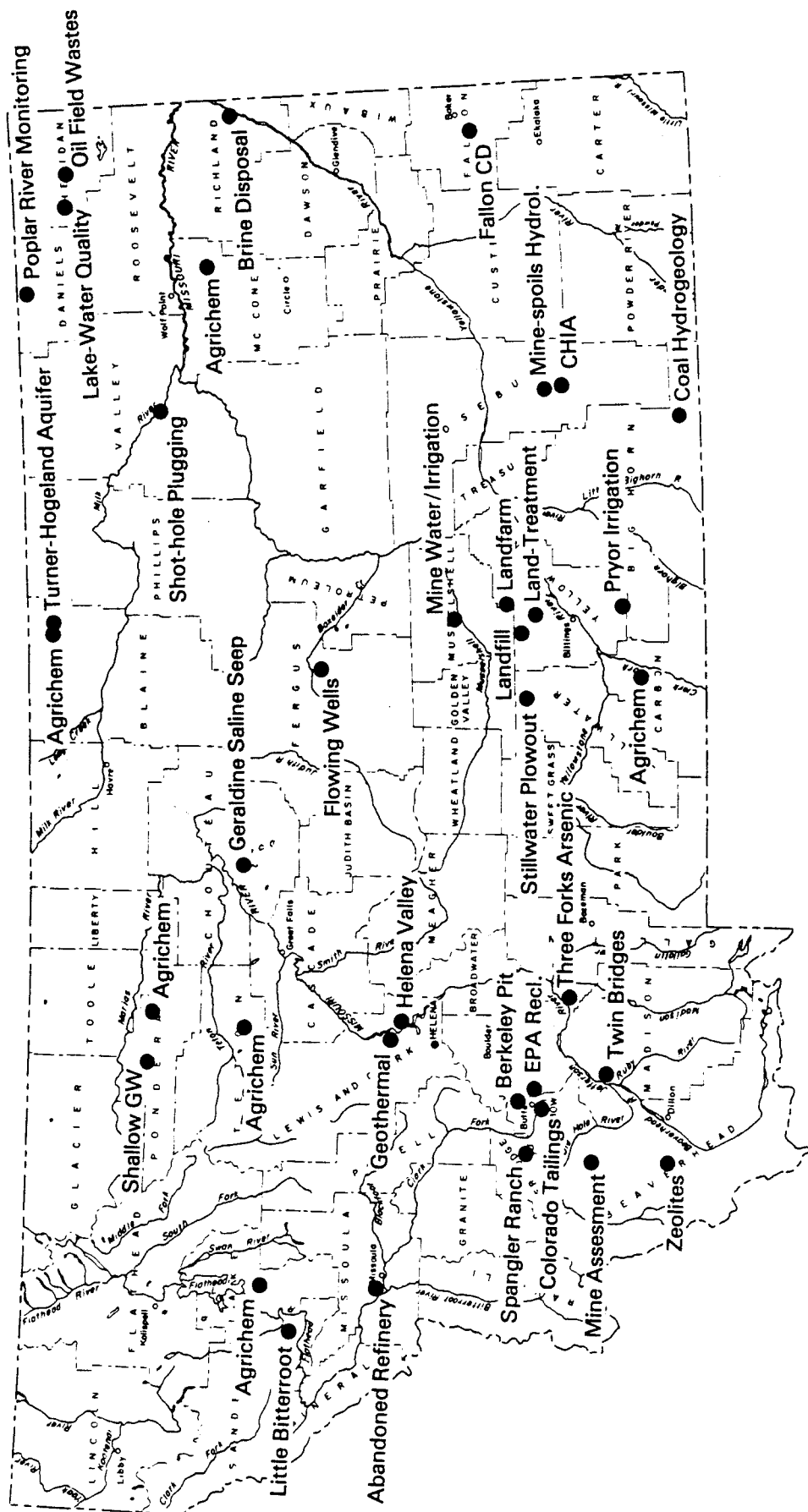
The Bureau will continue to modernize its Publications Office through applications of state-of-the-art-computer technology.

Finally, the Bureau Analytical Laboratory has been extensively remodeled and modernized in the current biennium. Through an innovative lease-purchase agreement, the Laboratory has purchased a Perkin-Elmer Elan 5000 Inductively Coupled Plasma Mass Spectrometer (ICP-MS), an advanced analytical instrument that provides unique capabilities to the Bureau of the State. These capabilities should be enhanced even more by addition of laser-ablation technology in the next biennium, to provide for rapid analysis of solid materials. The Laboratory has also acquired a Beckman LS6000SC Liquid Scintillometer for analysis of radon and tritium in ground water. Funding is being sought to expand the unique capabilities of the Laboratory into a major analytical center that will complement the functions of laboratories in other State agencies and the University System, and will provide a level of analytical support not available now in Montana.

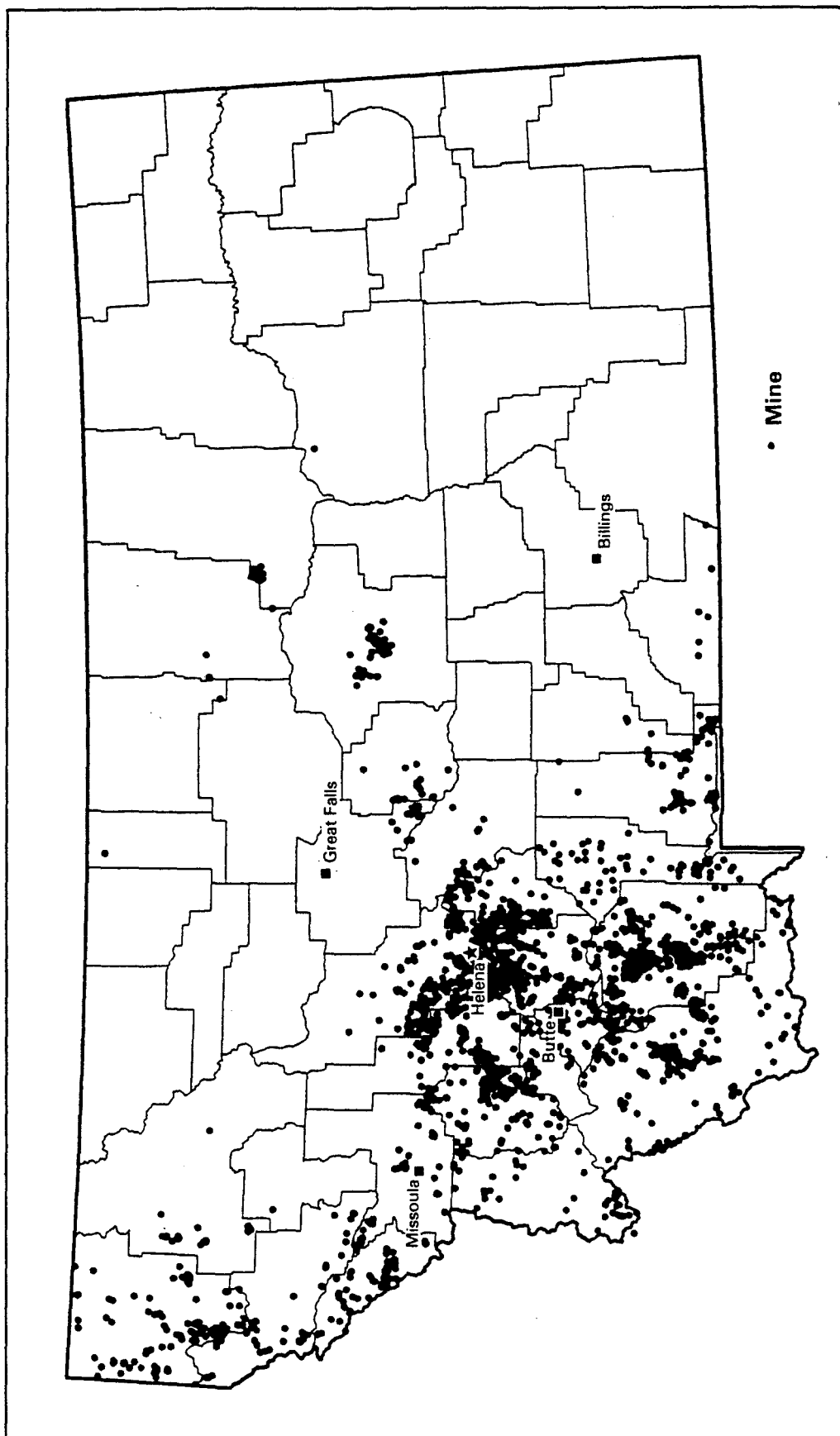


CO-GEO MAP PROJECT—AREAS OF RESPONSIBILITY

EXHIBIT 1
DATE 1-19-93
SB

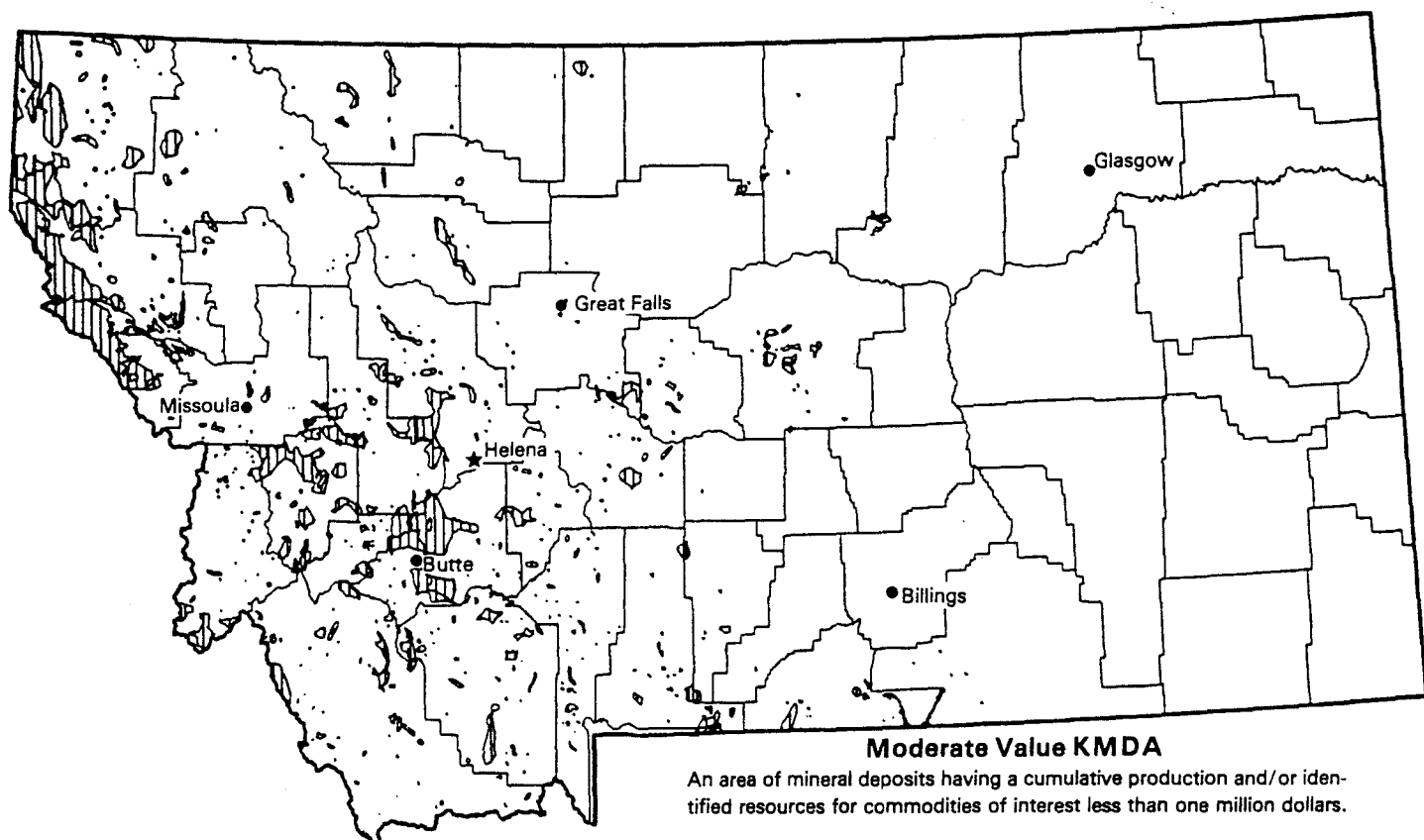
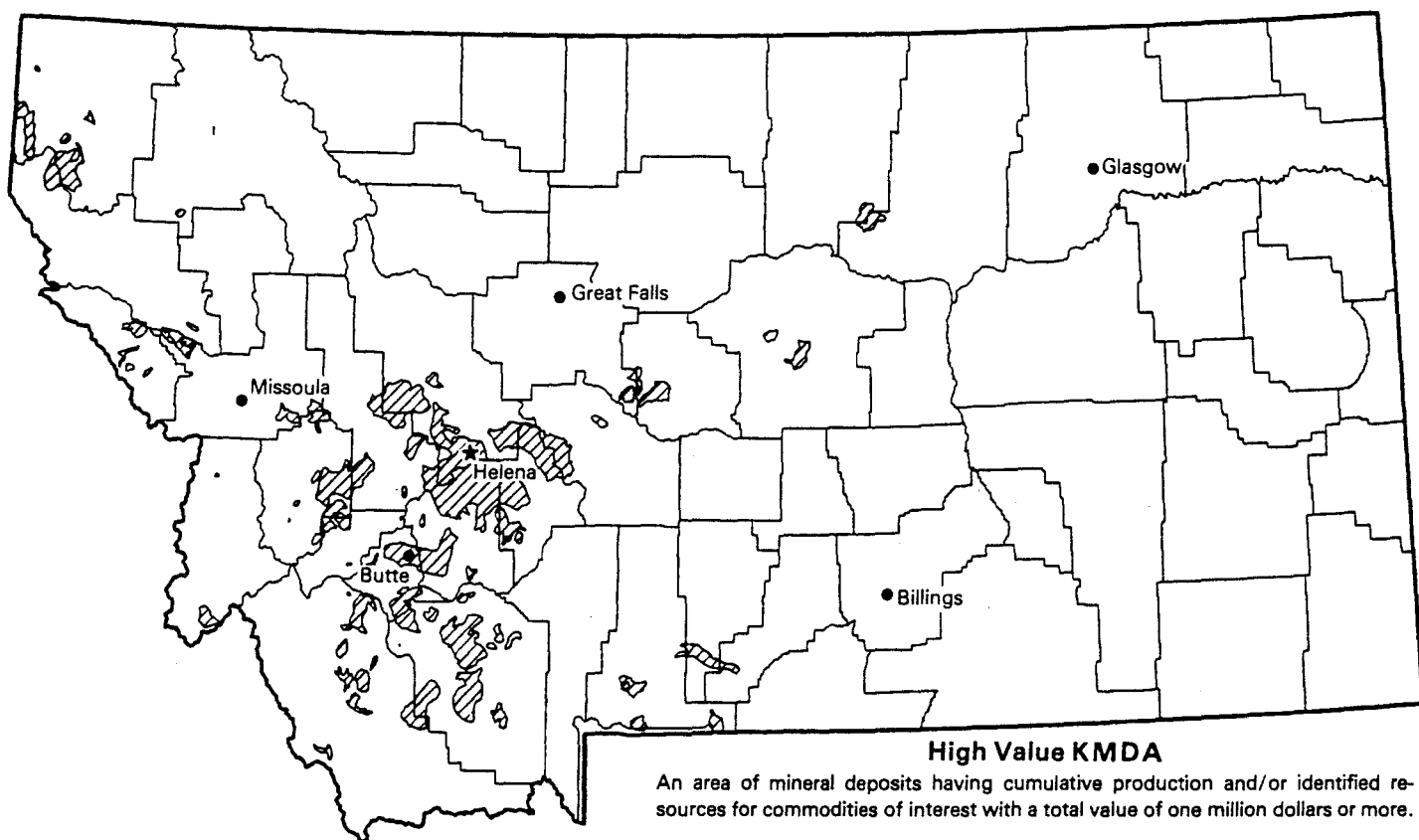


Projects of the Hydrology section span all aspects of Montana ground water in all parts of the state.

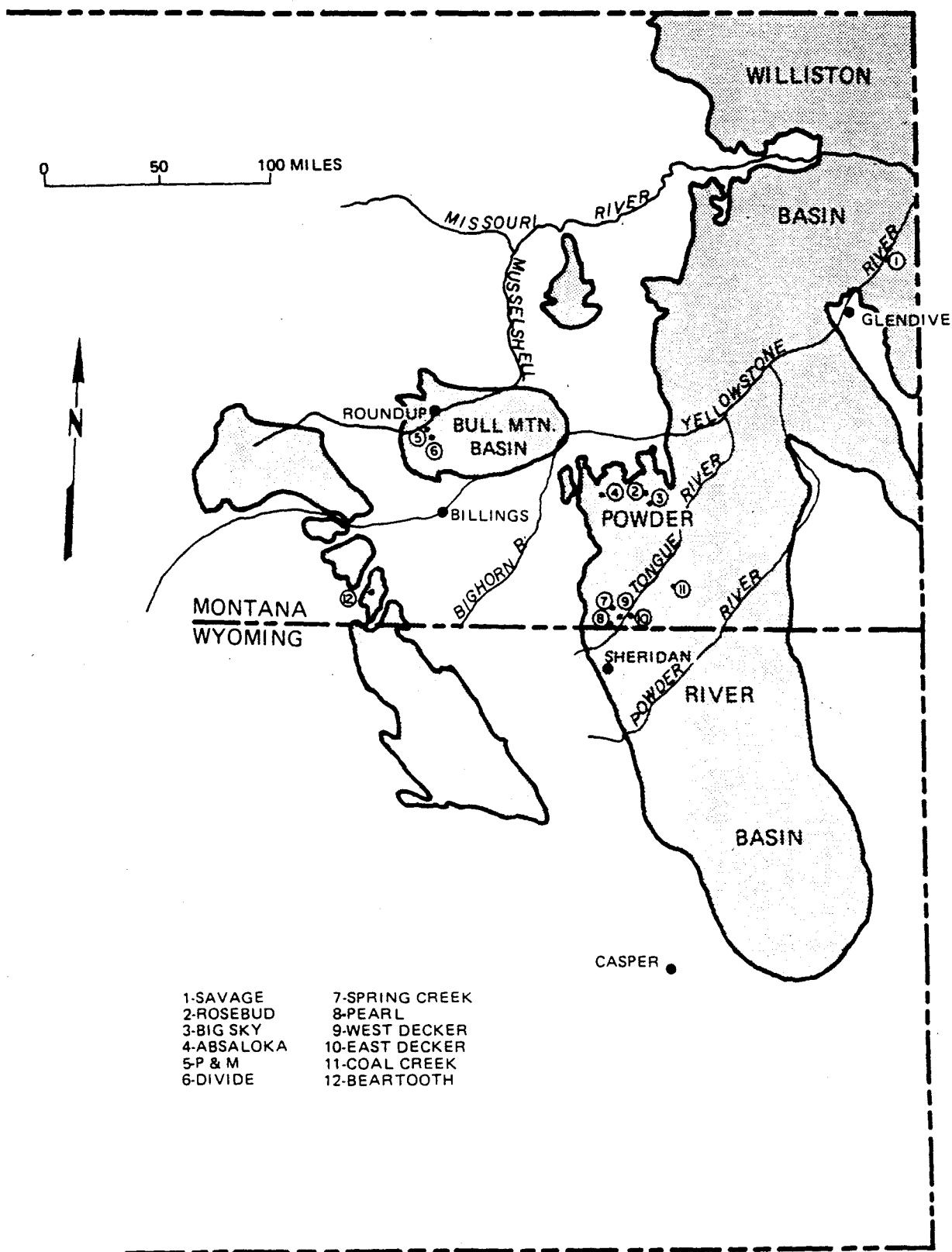


Metal and industrial mining properties are aided by information programs for miners.

EXHIBIT 1
DATE 1-19-93
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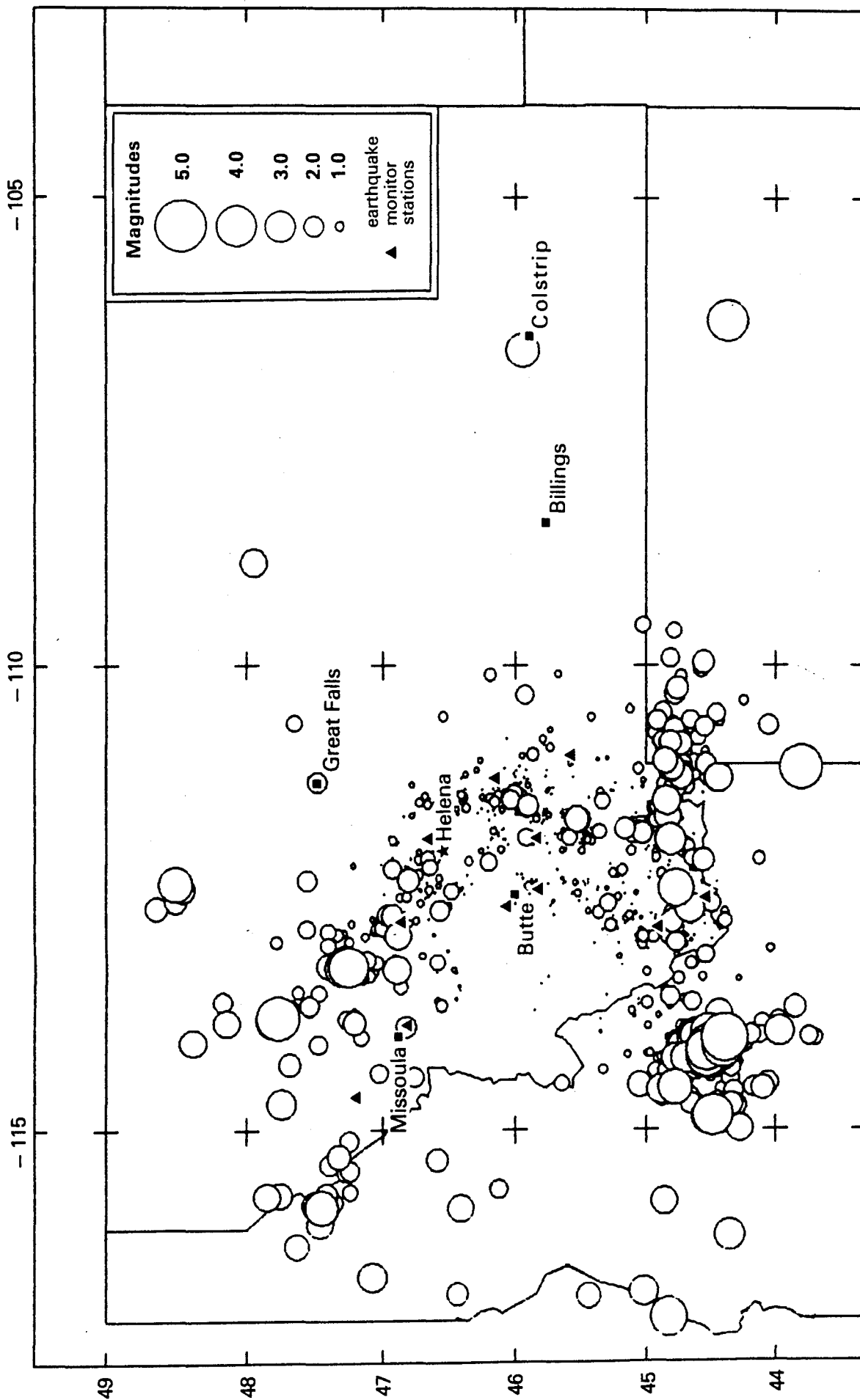


Mineral discovery potential is being assessed to weigh against other values for land-use decisions.

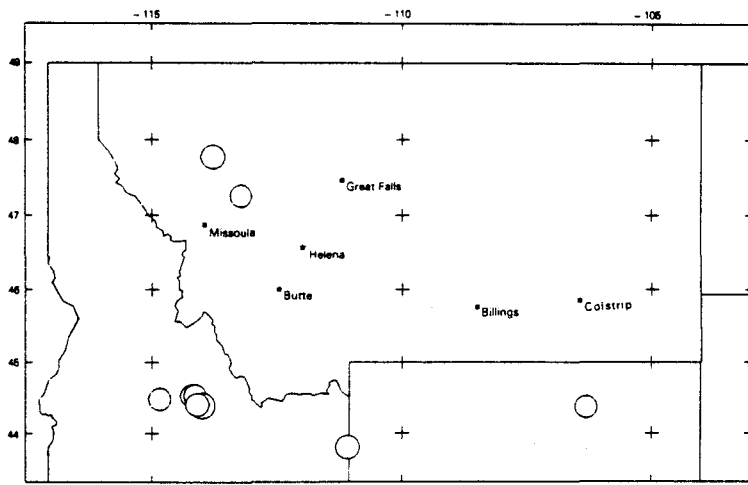


The NCRDs program assesses the quantity and quality of coal resources in Montana.

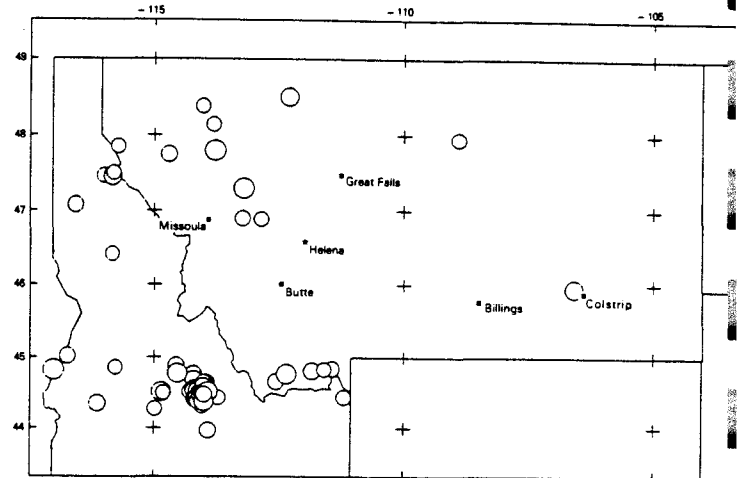
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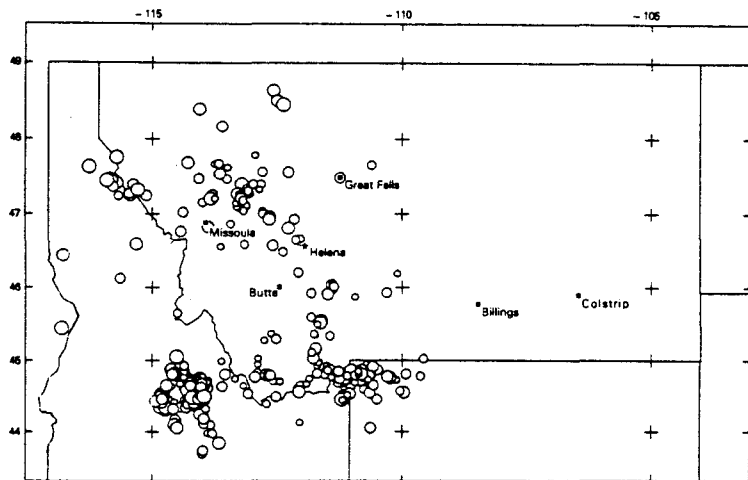
Earthquakes were monitored this biennium by ten Bureau-operated seismograph stations.



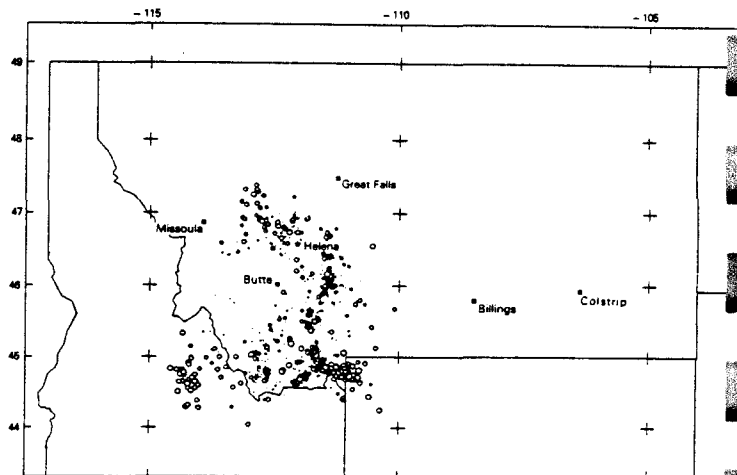
Quakes between 4.0 and 5.0 magnitude.



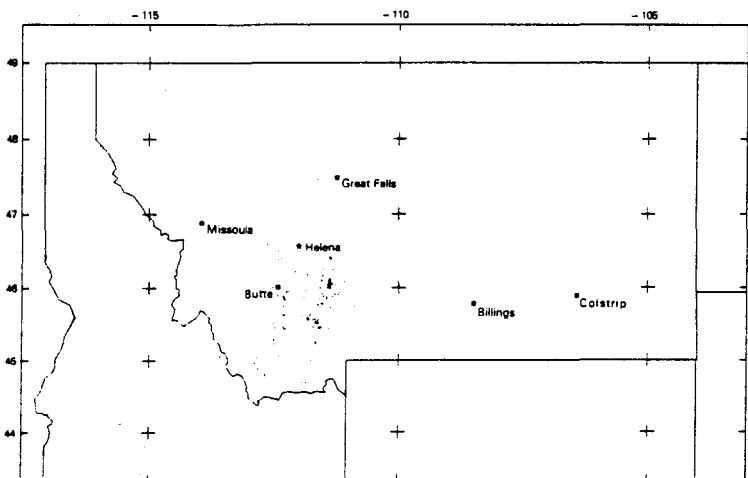
Quakes between 3.0 and 4.0 magnitude.



Quakes between 2.0 and 3.0 magnitude.

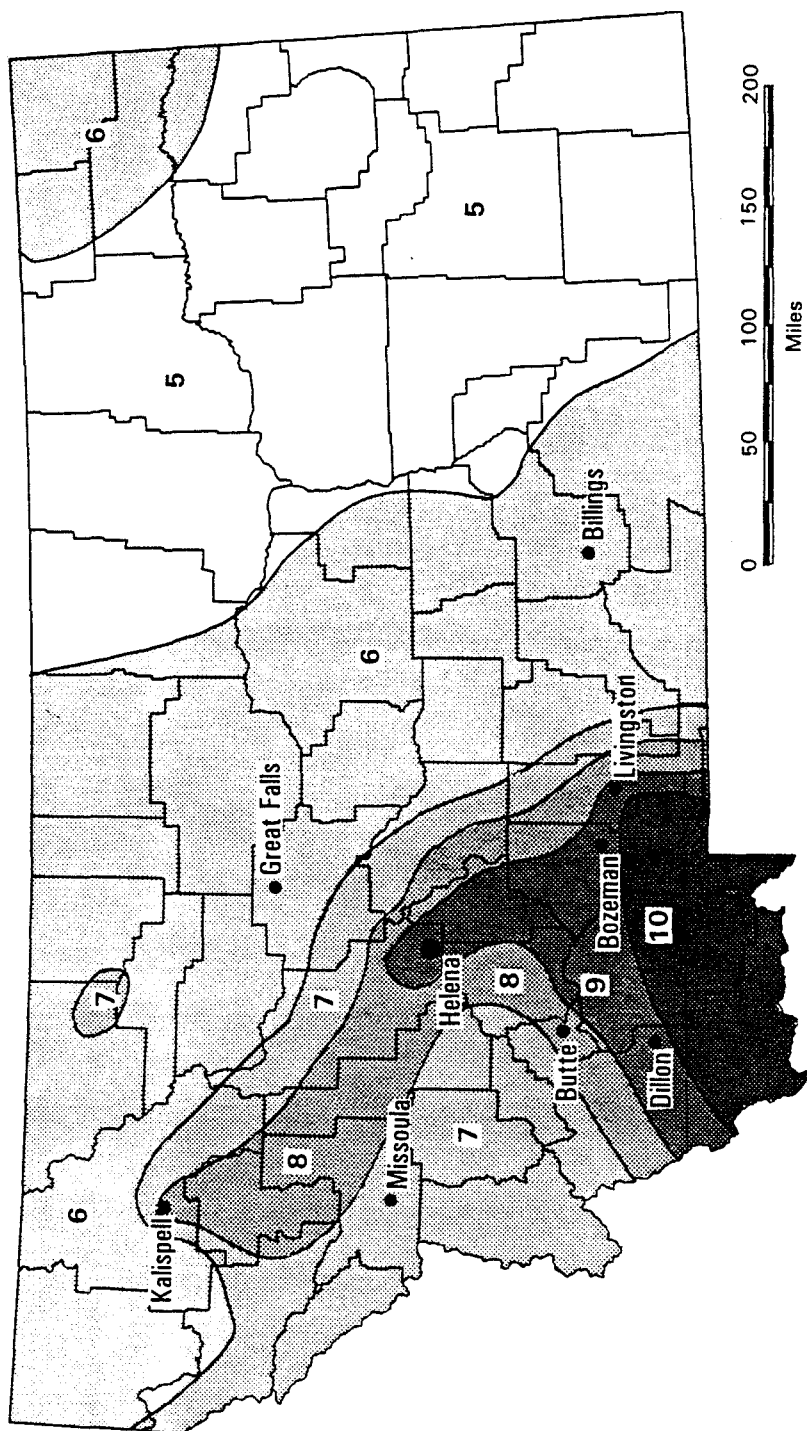


Quakes between 1.0 and 2.0 magnitude.

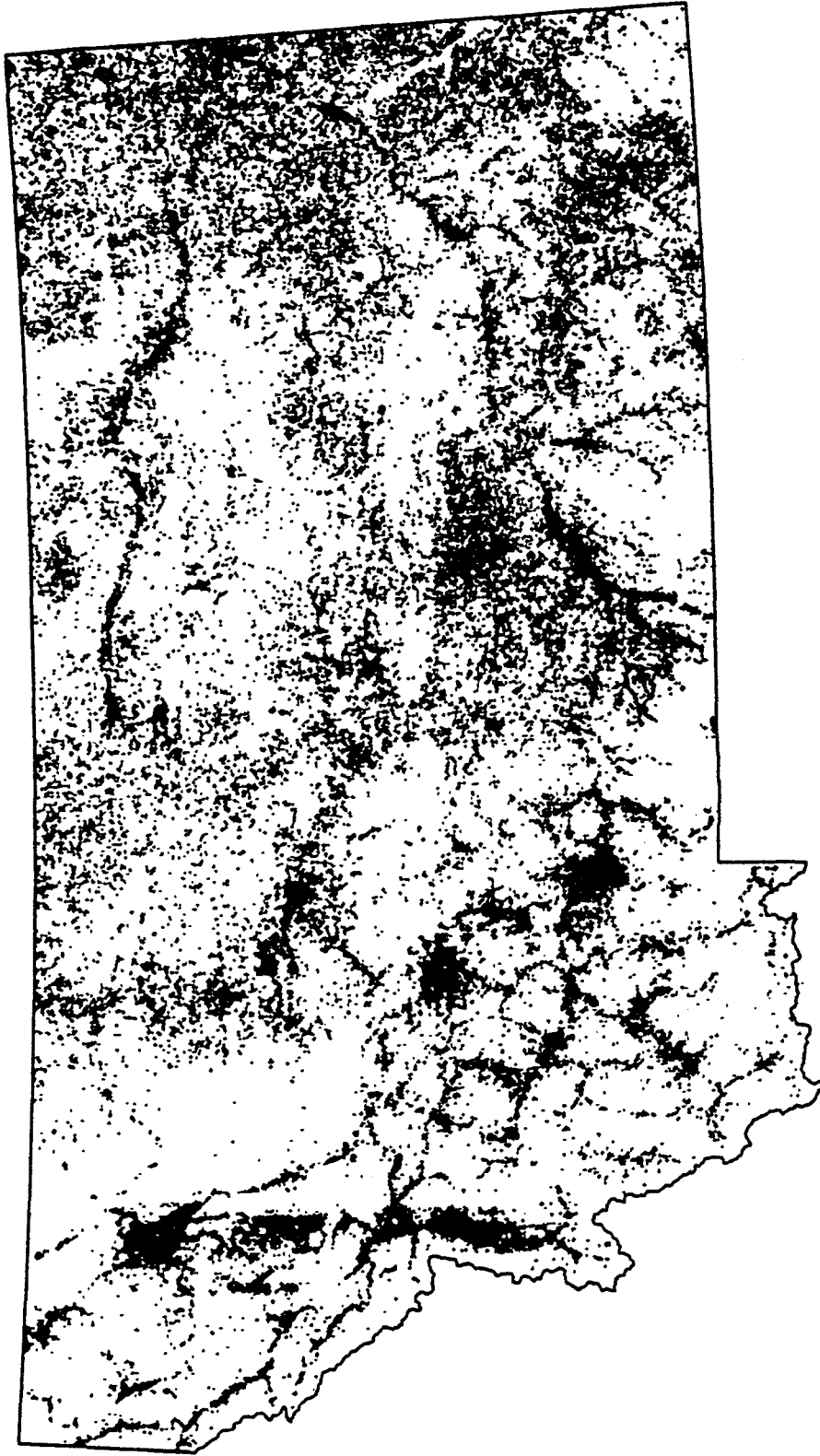


Quakes smaller than 1.0 magnitude.

Most Montana earthquakes occur along the intermountain seismic belt (northwest-southeast) and along the centennial tectonic belt (east-west).



Earthquake hazard areas of Montana based on both seismicity and distribution of active faults (from Bartholomew, Stickney, and Henry, 1988); Patterns show expected Modified Mercalli Intensities for bedrock.



Information on about 106,000 water wells is in computer storage at the Ground-Water Information Center.

MONT COLLEGE OF MIN SC & TECH
Program Summary

Independent Operations

Budget Item	Current Level Fiscal 1992	Current Level Fiscal 1993	Executive Fiscal 1994	LFA Fiscal 1994	Difference Fiscal 1994	Executive Fiscal 1995	LFA Fiscal 1995	Difference Fiscal 1995
FTE	26.17	26.17	26.19	26.19	0.00	26.19	26.19	0.00
Personal Services	1,001,940	954,708	1,022,409	1,022,409	0	1,022,592	1,022,592	0
Operating Expenses	329,885	359,115	349,085	345,959	3,126	337,042	332,856	4,186
Equipment	18,962	28,500	20,530	20,500	30	20,530	20,500	30
Debt Service	10,200	0	14,147	14,147	0	14,147	14,147	0
Total Costs	\$1,360,988	\$1,342,323	\$1,406,171	\$1,403,015	\$3,156	\$1,394,311	\$1,390,095	\$4,216
<u>Fund Sources</u>								
General Fund	0	0	1,406,171	1,359,015	47,156	1,394,311	1,346,095	48,216
Current Unrestricted	1,360,988	1,342,323	0	44,000	(44,000)	0	44,000	(44,000)
Total Funds	\$1,360,988	\$1,342,323	\$1,406,171	\$1,403,015	\$3,156	\$1,394,311	\$1,390,095	\$4,216

Page References

LFA Current Level—Page E-107

Executive Budget—Page E-100

Racicot Executive Budget—No specific reference

Current Level Differences

The current level differences between the LFA current level and the executive budget are caused by minor differences in several operating expenses categories and total less than 0.3 percent of the total budget.

MINOR DIFFERENCES

3,156

4,216

FUNDING DIFFERENCES—The LFA current level offsets general fund within this programs with revenue from the sale of maps and publications totaling \$44,000 each year. The executive funds this program entirely with general fund.

Budget Modifications

The executive budget includes no budget modifications for this program.

Board of Regents Budget Modifications

The Board of Regents have requested no budget modifications for this program.

Language

Exec. Over(Under) LFA
Fiscal 1994 Fiscal 1995

EXHIBIT 2
DATE 1-19-93
§§

ADDENDUM

Bureau of Mines Forest and Conservation Experiment Station

I. Comparison of 1995 Biennium to 1993 Biennium

Table 1 compares total expenditures in the 1995 biennium to the Bureau of Mines in the LFA current level and the executive budget to actual fiscal 1992 and appropriated fiscal 1993 expenditures.

TABLE 1 Comparison of LFA Current Level and Executive to 1993 Biennium Bureau of Mines 1995 Biennium				
	Total Funds	1995 Biennium Over (Under) 1993 Biennium	General Fund	1995 Biennium Over (Under) 1993 Biennium
1993 Biennium*	\$2,703,315	---	\$2,613,410	---
1995 Biennium				
LFA Current Level	\$2,793,110	\$89,795	\$2,705,110	\$91,700
Executive Budget	\$2,800,482	\$97,167	\$2,800,482	\$187,072
*Fiscal 1992 actual expenditures. Appropriated fiscal 1993 after all special session action.				

Table 2 makes the same comparison for the Forest and Conservation Experiment Station (FCES).

TABLE 2 Comparison of LFA Current Level and Executive to 1993 Biennium Forest and Conservation Experiment Station 1995 Biennium		
	Total	1995 Biennium Over (Under) 1993 Biennium
1993 Biennium*	\$1,404,691	---
1995 Biennium		
LFA Current Level	\$1,398,825	(\$5,866)
Executive Budget	\$1,496,604	\$91,913
*Fiscal 1992 actual expenditures. Appropriated fiscal 1993 after all special session action.		

EXHIBIT 3 A
DATE 1-19-93
SB

Education and Cultural Resources Subcommittee
January 19, 1993

II. RERS Data Update

As stated in the Budget Analysis, the Regents' Employee Reporting System (RERS) was used to calculate personal services and FTE totals in the 1995 biennium for both the Forest and Conservation Experiment Station and the Bureau of Mines. However, longevity increments and some benefits required adjustment. A new personal services calculation was made using RERS on December 22, 1992, the results of which are compared to the LFA current level in Table 3.

TABLE 3 Comparison of RERS Calculations of Personal Services Bureau of Mines and FCES 1995 Biennium		
	Fiscal 1994	Fiscal 1995
Initial RERS Run		
Bureau of Mines	\$1,022,592	\$1,022,592
FCES	<u>572,497</u>	<u>572,707</u>
Subtotal	\$1,595,089	\$1,595,299
December 22 RERS Run		
Bureau of Mines	\$1,035,354	\$1,036,015
FCES	<u>613,603</u>	<u>612,295</u>
Subtotal	\$1,648,957	\$1,648,310
Over (Under) Initial Run		
Bureau of Mines	\$12,762	\$13,423
FCES	<u>41,106</u>	<u>39,588</u>
Subtotal	\$53,868	\$53,011

The initial RERS run used actual fiscal 1992 FTE and salaries to derive the fiscal 1994 and 1995 personal services and FTE, updated to fully reflect the 1993 biennium pay plan. The latest RERS run incorporates fiscal 1993 FTE and salaries, adjusted for a full year of the fiscal 1993 pay plan.

In addition to the Bureau of Mines and the FCES, all incremental programs within the six university units (research, public service, and plant operation and maintenance), as well as the Agriculture Experiment Station, the Cooperative Extension Service, and the Fire Services Training School, incorporate the RERS run.

ISSUE: The issue for committee consideration is whether the updated RERS run will be used to calculate personal services.

III. RIT Funds in Bureau of Mines

Senate Bill 94 passed by the 1991 legislature created the groundwater assessment account. In the 1993 biennium, this account is allocated a portion of various fees. In the

Education and Cultural Resources Subcommittee
January 19, 1993

1995 biennium, the account will be allocated 14.1 percent of the proceeds of the resource indemnity and groundwater assessment tax. When the account's cash balance reaches \$666,000, all income will be deposited to the RIT trust. Anticipated revenues to the account in fiscal 1994 total \$666,000.

The Bureau of Mines was authorized in SB 94 to "...expend amounts from the account necessary to carry out..." the provisions of the bill. This language does not constitute an appropriation, and the legislature did not specifically appropriate any funds for this purpose in House Bill 2. In the 1993 biennium, the bureau created and expended funds from a restricted account. (Restricted funds are appropriated by the legislature in language, only.)

ISSUE: The issue for committee consideration is whether to add an appropriation for the anticipated expenditures from the account in the 1995 biennium to the Bureau of Mines.

TP3B:lt:bureau.doc

EXHIBIT 3B
DATE 1-19-93
SB



STATE OF MONTANA
ENVIRONMENTAL QUALITY COUNCIL

STATE CAPITOL
HELENA, MONTANA 59620
(406) 444-3742

Deborah B. Schmidt, Executive Director

GOV. STAN STEPHENS
Designated Representative
Art Wittich

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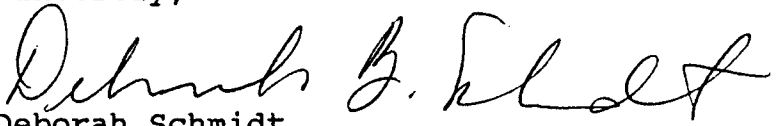
January 19, 1993

Representative Royal Johnson
Chairman of the Education and
Cultural Resources Subcommittee

Dear Chairman Johnson:

The Environmental Quality Council has endorsed the Groundwater Assessment Act's long term funding mechanism as embodied in 85-2-905, MCA. The Water Policy Committee has endorsed full funding for the Groundwater Assessment program. Both the Council and Committee believe it is critical to establish a basis for understanding Montana's groundwater resources.

Sincerely,


Deborah Schmidt
Executive Director, EQC

ENC. 4
DATE 1-19-93
SR

Part 9

Ground Water Assessment

EXHIBIT SA
DATE 1-19-93
SB _____

85-2-901. Short title. This part may be cited as the "Montana Ground Water Assessment Act".

History: En. Sec. 1, Ch. 769, L. 1991.

Compiler's Comments

Effective Date: Section 21(1), Ch. 769, L. 1991, provided that this section is effective July 1, 1991.

85-2-902. Findings and purpose. (1) The legislature finds that:

(a) Montana's citizens depend on ground water for a variety of uses, including domestic, agricultural, industrial, irrigation, mining, municipal, power, and recreation, and for maintenance of ecosystems and surface water supplies;

(b) ground water supplies and quality are threatened by a variety of contaminant sources;

(c) there is insufficient information characterizing the volume, quality, and flow patterns of the state's ground water;

(d) ground water information deficiencies are hampering the efforts of citizens and units of government to properly manage, protect, and develop ground water;

(e) government policies and programs should focus on preventing ground water contamination and supply depletion, but in order for preventive policies and programs to be effective, better ground water information is required; and

(f) there is a need for better coordination among those numerous units of state, federal, and local government with responsibility for ground water management, protection, and development.

(2) The purposes of this part are:

(a) to improve the quality of ground water management, protection, and development decisions within the public and private sectors by establishing a program to systematically assess and monitor the state's ground water and to disseminate the information to interested persons; and

(b) to improve coordination of ground water management, protection, development, and research functions among units of state, federal, and local government by establishing a ground water assessment steering committee.

History: En. Sec. 2, Ch. 769, L. 1991.

Compiler's Comments

Effective Date: Section 21(1), Ch. 769, L. 1991, provided that this section is effective July 1, 1991.

85-2-903. Definitions. As used in this part, the following definitions apply:

(1) "Aquifer" means a water-bearing, subsurface formation capable of yielding sufficient quantities of water to a well for a beneficial use.

(2) "Ground water assessment steering committee" means the committee established by 2-15-1523.

(3) "Ground water characterization program" means a program to systematically assess and document the hydrogeology and quality of the state's major aquifers.

(4) "Ground water characterization study" means the assessment of individual aquifers in specific areas within the state.

(5) "Ground water monitoring program" means a program to produce and maintain a long-term record of ground water chemistry and water level changes, based on information collected from a statewide network of observation wells.

History: En. Sec. 3, Ch. 769, L. 1991.

Compiler's Comments

Effective Date: Section 21(1), Ch. 769, L. 1991, provided that this section is effective July 1, 1991.

EXHIBIT SB
DATE _____
SB _____

85-2-904 reserved.

85-2-905. (Temporary) Ground water assessment account. (1) There is a ground water assessment account within the state special revenue fund established in 17-2-102. The Montana bureau of mines and geology is authorized to expend amounts from the account necessary to carry out the purposes of this part.

(2) The account may be used by the Montana bureau of mines and geology only to carry out the provisions of this part.

(3) Subject to the direction of the ground water assessment steering committee, the Montana bureau of mines and geology shall investigate opportunities for the participation and financial contribution of agencies of federal and local governments to accomplish the purposes of this part.

(4) There must be deposited in the account:

(a) the portion of the application filing fee for a permit to beneficially use ground water, allocated pursuant to 85-2-302(2);

(b) the portion of the filing fee for processing notices of completion of ground water development, allocated pursuant to 85-2-306(5);

(c) the portion of the water well contractor, driller, and monitoring well constructor license fees, allocated pursuant to 37-43-303(2), and the portion of the license renewal fee, allocated pursuant to 37-43-307(1);

(d) the portion of public water supply system fees, allocated pursuant to 75-6-108;

(e) funds provided by federal or state government agencies and by local governments to carry out the purposes of this part; and

(f) funds provided by any other public or private sector organization or person in the form of gifts, grants, or contracts specifically designated to carry out the purposes of this part. (*Terminates July 1, 1993—sec. 22, Ch. 769, L. 1991.*)

85-2-905. (Effective July 1, 1993) Ground water assessment account. (1) There is a ground water assessment account within the state special revenue fund established in 17-2-102. The Montana bureau of mines and

geology is authorized to expend amounts from the account necessary to carry out the purposes of this part.

(2) The account may be used by the Montana bureau of mines and geology only to carry out the provisions of this part.

(3) Subject to the direction of the ground water assessment steering committee, the Montana bureau of mines and geology shall investigate opportunities for the participation and financial contribution of agencies of federal and local governments to accomplish the purposes of this part.

(4) There must be deposited in the account:

(a) on July 1, 1993, and at the beginning of each succeeding fiscal year, 14.1% of the proceeds from the resource indemnity and ground water assessment tax as authorized by 15-38-106, unless at the beginning of the fiscal year the unobligated cash balance in the ground water assessment account:

(i) equals or exceeds \$666,000, in which case no allocation will be made and the funds must be deposited in the resource indemnity trust fund established by 15-38-201; or

(ii) is less than \$666,000, in which case an amount equal to the difference between the unobligated cash balance and \$666,000 must be allocated to the ground water assessment account and any remaining amount must be deposited in the resource indemnity trust fund established by 15-38-201;

(b) funds provided by federal or state government agencies and by local governments to carry out the purposes of this part; and

(c) funds provided by any other public or private sector organization or person in the form of gifts, grants, or contracts specifically designated to carry out the purposes of this part.

History: En. Secs. 4, 5, Ch. 769, L. 1991.

Compiler's Comments

Appropriation: Section 18, Ch. 769, L. 1991, provided: "There is appropriated to the Montana bureau of mines and geology for the biennium ending June 30, 1993, all funds in the ground water assessment account, established in [section 4] [85-2-905], in the state special revenue fund, for purposes of establishing a ground water monitoring program and a ground water characterization program."

Coordination Instruction: Section 20, Ch. 769, L. 1991, provided: "If Senate Bill No. 407 is passed and approved and does not contain a provision that allocates a portion of public water supply system fees to the ground water assessment account, then [section 4(4)(d) of this act] [85-2-905(4)(d) (temporary version)]

is void." Senate Bill No. 407 was approved April 26, 1991, as Ch. 645, L. 1991, and included a provision allocating fees to the ground water assessment account. Therefore, 85-2-905(4)(d) (temporary version) is valid.

Effective Date: Section 21(1), Ch. 769, L. 1991, provided that the temporary version of this section is effective July 1, 1991.

Termination: Section 22, Ch. 769, L. 1991, provided that subsections (4)(a) through (4)(d) of this section terminate July 1, 1993. Chapter 769, L. 1991, enacted two versions of the ground water assessment account. The effect of the termination provided in sec. 22, Ch. 769, L. 1991, is the implementation of the 1993 version of 85-2-905.

85-2-906. Ground water characterization program — ground water monitoring program. (1) There is a ground water characterization program and a ground water monitoring program.

(2) Subject to the direction of the ground water assessment steering committee, the Montana bureau of mines and geology shall establish and administer the ground water characterization program and the ground water monitoring program.

EXHIBIT 5
DATE 1-14-93

(3) The Montana bureau of mines and geology shall work with units of local government, ground water users, and other affected organizations and individuals in areas of the state that are included in a ground water characterization study and, if warranted by the level of local interest in a ground water characterization study, shall establish a local ground water assessment advisory committee.

(4) The ground water assessment steering committee created by 2-15-1523 shall:

(a) oversee expenditures from the ground water assessment account and organization plans and work plans proposed by the Montana bureau of mines and geology to implement the ground water characterization and ground water monitoring programs, including plans for local involvement and participation in ground water characterization studies;

(b) approve ground water monitoring sites;

(c) prioritize and select ground water characterization study areas;

(d) develop plans for ground water information management and dissemination;

(e) develop plans for integrating existing ground water information with information collected under the programs created by subsection (1);

(f) coordinate ground water information collection projects sponsored by individual units of state, federal, or local government with the programs created by subsection (1); and

(g) evaluate reports and other information produced by the Montana bureau of mines and geology from ground water characterization studies.

(5) The ground water assessment steering committee shall invite representatives of local governments and Indian tribes with jurisdiction over areas of the state that are included in an active ground water characterization study or in a study scheduled to begin in the ensuing biennium, as well as affected citizens in these areas, to participate in steering committee meetings.

History: En. Sec. 6, Ch. 769, L. 1991.

Compiler's Comments

Effective Date: Section 21(1), Ch. 769, L. 1991, provided that this section is effective July 1, 1991.

85-2-907. Ground water information collection by local governments. Units of local government may conduct ground water information collection projects in advance of ground water characterization studies conducted under the program created by 85-2-906(1). Local governments shall consult with the Montana bureau of mines and geology in designing local ground water information collection projects and studies and, subject to local funding availability, shall conduct the local projects and studies to produce information that is compatible with the type of information produced by the ground water characterization program.

History: En. Sec. 7, Ch. 769, L. 1991.

Compiler's Comments

Effective Date: Section 21(1), Ch. 769, L. 1991, provided that this section is effective July 1, 1991.

EXHIBIT SD
DATE 1-19-93
SB

MONTANA FOREST AND CONSERVATION EXPERIMENT STATION

- 1) MISSION STATEMENT
- 2) PROGRAM GOALS
- 3) PROGRAM OBJECTIVES
- 4) FY1992-1993 APPROPRIATION
- 5) FY1992-1993 ACCOMPLISHMENTS
- 6) GRANT ACTIVITY
- 7) FY1994-1995 REQUEST

EXHIBIT 6
DATE 1-19-93
SB _____

MONTANA FOREST AND CONSERVATION EXPERIMENT STATION

Mission Statement

The Montana Forest and Conservation Experiment Station was established by the Legislature in 1937 to carry out research on the forests and forest land resources of Montana.

MONTANA FOREST AND CONSERVATION EXPERIMENT STATION

Program Goals

The Forest and Conservation Experiment Station seeks to provide public and private land managers and interested citizens with the information needed to attain the highest economic and social benefits from the forests of the State and to insure good stewardship of Montana's forest lands.

EXHIBIT 6
DATE 1-19-93
SB

MONTANA FOREST AND CONSERVATION EXPERIMENT STATION

Program Objectives

During the 1995 Biennium the Forest and Conservation Experiment Station will:

1. continue to identify the most critical natural resource management information gaps and carry out the needed research on a range of topics including:
 - Natural resource analysis and planning
 - Resource policy and conflict resolution
 - Measurement and management of timber resources
 - Wildlife conservation and habitat management
 - Good stewardship on private forest lands
 - Management of forested watersheds
 - Tourism and outdoor recreation development and management
 - Fire, insect, and disease management
 - Wood science, product development, and secondary manufacturing
2. summarize research results in a form useable by public resource managers, private forest land owners and other interested citizens of Montana.
3. disseminate research results and management implications through written publications, public meetings, workshops, short-courses, and personal interaction with resource managers.

MONTANA FOREST & CONSERVATION EXPERIMENT STATION
FY 94 - FY 95 BUDGET REQUEST

ANALYSIS OF 1992 - 1993 APPROPRIATION

	FY 92	FY 93
HB 2	\$711,138	\$711,940
92 RECISTION	<u>(\$11,068)</u>	<u>(\$36,536)</u>
	\$700,070	\$675,404
HB 509	<u>\$27,199</u>	<u>\$42,602</u>
	\$727,269	\$718,006
HB 509 ADDITION	<u>\$0</u>	<u>\$13,023</u>
	\$727,269	\$731,029
93 RECISION	<u>\$0</u>	<u>(\$28,720)</u>
TOTAL	<u>\$727,269</u>	<u>\$702,309</u>

ACTUAL EXPENDITURE

	FY 1992
FY 1992	\$715,405
FY 1992 ENCUMBRANCES	<u>\$10,921</u>
TOTAL	\$726,326
PRIOR YEAR BALANCE	<u>\$943</u>
FY 1992 TOTAL	<u>\$727,269</u>

EXHIBIT 6
DATE 1-19-93
SB _____

MONTANA FOREST AND CONSERVATION

EXPERIMENT STATION

BUDGET REQUEST

FY 1994 – 1995

MONTANA FOREST AND CONSERVATION EXPERIMENT STATION
FY 94 - FY 95 BUDGET REQUEST

	BOARD OF REGENTS		EXECUTIVE PROPOSAL		LFA PROPOSAL	
	FY 94	FY 95	FY 94	FY 95	FY 94	FY 95
PERSONAL SERVICES						
Salaries & Wages	\$513,826	\$514,208	\$533,691	\$533,691	\$486,751	\$486,751
Fringe Benefits	\$97,776	\$98,086	\$80,201	\$80,750	\$85,746	\$85,956
Total	\$611,602	\$612,294	\$613,892	\$614,441	\$572,497	\$572,707
OPERATING EXPENSES						
	\$124,036	\$125,220	\$119,704	\$121,033	\$119,646	\$120,975
CAPITAL EQUIPMENT	\$38,100	\$35,600	\$13,767	\$13,767	\$6,500	\$6,500
TOTAL	\$773,738	\$773,114	\$747,363	\$749,241	\$698,643	\$700,182

EXHIBIT 6
DATE 1-14-93
SB _____

MONTANA FOREST & CONSERVATION EXPERIMENT STATION
FY 94 – FY 95 BUDGET REQUEST

ANALYSIS OF CHANGE
REGENTS EMPLOYEES REPORTING SYSTEM

RERS (1) OCTOBER 16, 1992	
FTE	15.03
SALARIES	\$486,751
BENEFITS	\$65,436
INSURANCE	\$20,520
TOTAL	\$572,707

RERS (2) NOVEMBER 17, 1992	
FTE	15.03
SALARIES	\$513,827
BENEFITS	\$71,601
INSURANCE	\$22,800
TOTAL	\$608,228

RERS JANUARY 12, 1993	
FTE	15.03
SALARIES	\$513,826
BENEFITS	\$79,368
INSURANCE	\$18,407
TOTAL	\$611,601

- (1) Does not include FY 93 salary increases or correct fringe benefit projections.
(2) Fringe Benefit calculations are incorrect.

MONTANA FOREST & CONSERVATION EXPERIMENT STATION
FY 94 – FY 95 BUDGET REQUEST

ANALYSIS OF 1994 – 1995 INCREASES

	<u>FY 94</u>	<u>FY 95</u>
FY 92 Actual Expense:	\$715,405	\$727,269
FY 92 Encumbrances	\$10,921	
PY Balance	\$943	
	<u>\$727,269</u>	
INCREASES:		
Salary Adjustments	\$13,078	\$14,954
Contracted Services	\$248	\$248
Mtnce Contracts	\$2,477	\$2,477
Equipment Replacemen	\$12,666	\$10,666
Computers	\$18,000	\$17,500
	<u>\$773,738</u>	<u>\$773,114</u>

EQUIPMENT REQUESTS

<u>OC 3100 Equipment</u>	<u>FY 94</u>	<u>FY 95</u>
Global Positioning System Receiver	\$14,000	\$14,000
GIS Workstation	\$4,000	\$4,000
Weather Station	\$2,000	\$0
	<u>\$20,000</u>	<u>\$18,000</u>
FY 92 CARRY FORWARD	(\$7,334)	(\$7,334)
Sub Total	<u>\$12,666</u>	<u>\$10,666</u>
 <u>OC 3134 Single User Computers</u>		
GIS Laptop Computers 2 @ \$6,000	\$6,000	\$6,000
LCD Overhead Computer Projector	\$4,500	\$0
Personal Computers 5 @ \$3500	\$7,000	\$10,500
Computer Printers 3 @ \$500	\$500	\$1,000
Sub Total	<u>\$18,000</u>	<u>\$17,500</u>
 <u>OC 3402 Software</u>	<u>\$100</u>	<u>\$100</u>
 TOTAL	<u>\$30,766</u>	<u>\$28,266</u>

EXHIBIT 6
DATE 1-19-93
BY _____

**MONTANA FOREST AND CONSERVATION
EXPERIMENT STATION**

JUSTIFICATION

FY 1994 -1995

EQUIPMENT DETAIL

Agency Name Montana Forest and Conservation Experiment Station Agency Number 5111

Program Name Research Program Number 02

Control Variable Name _____ C.V. Number _____

FTE, OBJECT OF EXPENDITURE or ACCT ENTITY	Document Adjustment	1992	Requested	
			FY94	FY95
3100	Global Positioning System Receiver Field instrument for determining precise, on-the-ground locations of field plots, development, forest stands, etc. 2 @ \$14,000		14,000	14,000
3100	Geographic Information System Work Station IBM RISC 6000, Model 320, to run more powerful GIS programs such as ARC/INFO 2 @ \$4,000		4,000	4,000
3100	Weather Station		2,000	
3134	Portable "Laptop" Computers for Geographic Information System workshops and demonstrations at locations away from the campus 2 @ \$6,000	7,404		
3134	LCD Overhead projector for projecting computer output to a large screen		6,000	6,000
3134	Personal Computers - 5 @ \$3,500		4,500	
3134	Computer printers - 3 @ \$500		7,000	10,500
			500	1,000

EXHIBIT
DATE

6
1-19-93

MONTANA FOREST AND CONSERVATION

EXPERIMENT STATION

GRANT ACTIVITY

FY 1994 – 1995

EXHIBIT 6
DATE 1-19-93
SE

The University of Montana/Steven Running Award Volume
Current and scheduled support

Org. Number/ Sponsor	Project Title	Effective Dates	Amount
Org. 2075 USDA Forest Service	Application of Remote Sensing and Digital Image Analysis for Assessing Wildland Fire Severity	8/17/89-12/31/93	\$ 49,500
Org. 2296 Battelle Pacific Northwest Laboratories	Addition of Non-methane Hydrocarbons and Soil CO ₂ to the FOREST-BGC Ecosystem Model	12/21/90-9/30/93	\$ 52,997
Org. 2384 National Park Service	Implement and Validate a Regional Ecosystem Simulation System (RESSys) for Glacier National Park, Based on Ecosystem Biogeochemical and Biophysical Processes	9/28/91-9/27/97	\$ 395,000
Org. 2400 U.S. Fish and Wildlife Service	Microclimate Mapping, Based on the Mountain Climatology Model	9/1/92-12/31/93	\$ 46,668
Org. 2500 NSF	Collaborative Research: Estimating Regional Forest Evapo- transpiration and Photosynthesis with a Satellite-derived Vegetation Index and Surface Temperature	1/15/89-12/31/92	\$ 252,797
Org. 2503 NSF	Collaborative Research: Interaction of Climate Nutrition on Forest Production: Comparison of Controlling Factors in Contrasting Environments	3/1/90-8/31/93	\$ 165,491
Org. 2562 NASA	Parameterization, Testing and Validation of Microclimate and Ecosystem Models on the Oregon Transect	10/1/89-3/31/93	\$ 151,840

The University of Montana/Steven Running Award Volume
Current and scheduled support

Org. Number/ Sponsor	Project Title	Effective Dates	Amount
Org. 2567 NASA	Development of an Earth-observing System/Moderate Resolution Image Spectrometer	1/7/92-1/6/2002	\$ 7,935,000
Org. 2570 NASA	Extrapolation of Process Models of Evapotranspiration and Net Primary Production of Coniferous Forests to Large Spatial Scales	10/1/86-3/31/94	\$ 1,083,402
Org. 3224 NASA	Graduate Student Fellowship in Global Change Research (Student: Lars Pierce)	9/1/90-8/31/93	\$ 66,000
TOTAL			\$10,198,695

EXHIBIT 6
DATE 1-19-93
SB

MONTANA FOREST AND CONSERVATION EXPERIMENT STATION

Research Program Components

- **Management of Forest Stands**

- Forest biology, ecology
- Inventory of resources
- Growth and yield prediction, productivity
- Stand management
- Silvicultural treatment for varied objectives
- Sustainable ecosystem management
- Sustainable development, best management practices
- Landscape management, scenic values

- **Management of Water Resources**

- Impacts of forest practices on water resources
- Cumulative effects of forest practices
- Watershed rates of recovery from disturbance
- Use and management of riparian lands

- **Management of Recreational and Scenic Resources**

- Tourism impacts (social, economic, physical), resource development, and management
- Recreation resource protection and management
- Identification and management of scenic values
- Wilderness management

- **Management of Wildlife**

- Habitat management
- Ecology of threatened and endangered species
- Implications of land use practices on wildlife
- Maintenance of biological diversity

- **Maintenance of Forest Health**

- Fire protection and management
- Impacts of atmospheric deposition on forests
- Global climate change

- **Forest Stewardship on Forest Lands**

- Resource policy analysis, development; conflict resolution
- Economics of forest resource management
- Integration of timber, livestock, wildlife, water, and recreation resources
- Good management practices for private lands
- Capitalizing on multi-resource values

EXHIBIT 7
DATE 1-19-93
SB

**MONTANA FOREST AND CONSERVATION EXPERIMENT STATION
UNIVERSITY OF MONTANA**

COOPERATING AGENCIES AND ORGANIZATIONS

State of Montana

Department of Commerce
Tourism Promotions Division
Department of Fish, Wildlife and Parks
Department of Health and Environmental Sciences
Water Quality Bureau
Department of Natural Resources and Conservation
Flathead Basin Commission

Department of Revenue
Department of State Lands
Forestry Division
Governor's Tourism Advisory Council
Montana State University
Cooperative Extension
Agricultural Experiment Station

Federal Government

US Department of Agriculture
Cooperative State Research Service
Extension Service
Forest Service
Soil Conservation Service
US Department of the Interior
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Fish and Wildlife Service
National Park Service

US Environmental Protection Agency
US Department of Energy
National Aeronautics and Space Administration
National Science Foundation

Private organizations

Champion International Corporation
Plum Creek Timber Co.
Potlatch Corporation
Montana Association of State Grazing Districts
Montana Public Lands Council
Ducks Unlimited
Montana Water Resources Association
Montana Woolgrowers Association
American Fisheries Society
University of British Columbia
Washington State University
Washington Department of Natural Resources

Rocky Mountain Elk Foundation
Boise-Cascade Corporation
The Nature Conservancy
Montana Stock Growers Association
Trout Unlimited
Montana Logging Association
Montana Farm Bureau
Montana Association of Conservation Districts
University of Alberta
University of Idaho
British Columbia Ministry of Forests
Boone and Crockett Club

EXHIBIT 8
DATE 1-19-93
SP

HOUSE OF REPRESENTATIVES
VISITOR REGISTER

EDUCATION SUBCOMMITTEE DATE 1-19-93
DEPARTMENT(S) DIVISION

PLEASE PRINT

PLEASE PRINT

NAME	REPRESENTING	
L. D. NORMAN	MT TECH	
E. T. Ruppel	MT Tech	
John Hunter	MBMG	
Marvin Miller	MT Tech - MT. Burd & Munst. Cld	
WAYNE VAN VOAST	MBMG	
Sherley Stearns	UM / FCI	
Jim Devere	UM FCES	
James E. Todd	UM FCES	
Dennis Shurt	EQC	
John Sargent	MSG A	
Fred Colver	MSG A	
Roger North	MSG A	
Mary Jo Foss	MSG A	
David Holmgren	MSG A	
Barrie Farmer	ASMSU / MAS	
Sid Finsell	UM / FCES	

PLEASE LEAVE PREPARED TESTIMONY WITH SECRETARY. WITNESS STATEMENT
FORMS ARE AVAILABLE IF YOU CARE TO SUBMIT WRITTEN TESTIMONY.