COLORADO DEPARTMENT OF REGULATORY AGENCIES
OFFICE OF POLICY AND RESEARCH

GEOLOGISTS

2001 SUNRISE REVIEW

STATE OF COLORADO

DEPARTMENT OF REGULATORY AGENCIES
Office of the Executive Director
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Bill Owens
Governor

October 15, 2001

Members of the Colorado General Assembly
c/o the Office of Legislative Legal Services
State Capitol Building
Denver, Colorado 80203

Dear Members of the General Assembly:

The Colorado Department of Regulatory Agencies has completed its evaluation of the sunrise application for regulation of geologists and is pleased to submit this written report. The report is submitted pursuant to §24-34-104.1, Colorado Revised Statutes (C.R.S.), which provides that the Department of Regulatory Agencies shall conduct an analysis and evaluation of proposed regulation to determine whether the public needs, and would benefit from, the regulation.

The report discusses the question of whether there is a need for the regulation in order to protect the public from potential harm, whether regulation would serve to mitigate the potential harm, and whether the public can be adequately protected by other means in a more cost-effective manner.

Sincerely,

M. Michael Cooke

M. Michael Cooke
Executive Director

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The Sunrise Process

Background

Colorado law, §24-34-104.1, Colorado Revised Statutes (C.R.S.), requires that individuals or groups proposing legislation to regulate any occupation or profession first submit information to the Department of Regulatory Agencies (DORA) for the purposes of a sunrise review. The intent of the law is to impose regulation on occupations and professions only when it is necessary to protect the public health, safety or welfare. DORA must prepare a report evaluating the justification for regulation based upon the following criteria contained in the sunrise statute:

> (I) Whether the unregulated practice of the occupation or profession clearly harms or endangers the health, safety, or welfare of the public, and whether the potential for the harm is easily recognizable and not remote or dependent upon tenuous argument;
>
> (II) Whether the public needs, and can reasonably be expected to benefit from, an assurance of initial and continuing professional or occupational competence;
>
> (III) Whether the public can be adequately protected by other means in a more cost-effective manner.

Any professional or occupational group or organization, any individual, or any other interested party may submit an application for the regulation of an unregulated occupation or profession. Applications must be accompanied by supporting signatures and must include a description of the proposed regulation and justification for such regulation. Applications received by July 1 must have a review completed by DORA by October 15 of the year following the year of submission.

Methodology

The Department of Regulatory Agencies (DORA) has completed its evaluation of the proposal for regulation of geologists. During the sunrise review process, DORA performed a literature search, contacted and interviewed the applicants and other interested parties, and reviewed licensure laws in other states. In order to determine the number and types of complaints filed against geologists in Colorado, DORA contacted representatives of the Denver District Attorney's Office, the Denver/Boulder Better Business Bureau, the Office of the Attorney General, Consumer Protection Section, the State Board of Registration for Professional Engineers and Professional Land Surveyors, and the Governor's Advocacy Office.

A letter of inquiry was sent to the following associations soliciting information regarding the need for regulation of geologists: American Institute of Professional Geologists, Association of American State Geologists, Colorado Geological Survey, Colorado Petroleum Association, Society of Independent Professional Earth Scientists, American Association of Petroleum Geologists, Society of Economic Geologists, Association for Women Geoscientists, Colorado Oil & Gas Association, Colorado Petroleum Association, Colorado Department of Public Health & Environment Division of Hazardous Materials, Colorado Department of Transportation, Colorado Association of Realtors, Colorado Municipal League, Colorado Counties, Inc., and Colorado Association of Commerce & Industry. Five of the 16 organizations contacted responded to the inquiry.

Proposal for Regulation

A consortium of Colorado professional geologists submitted a sunrise application to the Department of Regulatory Agencies for review in accordance with the provisions of §24-34-104.1, C.R.S. The regulatory scheme is envisioned as being similar to existing legislation in other states. The following components characterize the program:

- Licensing program administered by the Department of Regulatory Agencies that would add professional geologists to the existing Board of Registration for Professional Engineers and Professional Land Surveyors. The composition of the Board would change from 9 to 11 members with the addition of 2 members being professional geologists. In addition, the member currently representing the professional engineer-professional land surveyor could be a professional geologist-professional land surveyor, a professional engineer-professional-geologist, or a professional engineer-professional land surveyor.

- Establishment of qualifications for licensure that include:

  - Minimum education standards, including a degree from an accredited program of four or more years of education with at least 30 semester (quarter equivalent) hours with a major in geology or a geological specialty;

  - Eligibility to take the examination predicated on graduation from a program accredited by an organization recognized by the Board;

  - Provision for written examinations in the "fundamentals of geology" and the "principles and practice of geology";

  - Completion of six years of geology experience obtained subsequent to completion of the academic requirements – Board may require that two years of experience be under the supervision of a licensed geologist;

  - Presentation of letters of reference to attest to good moral and ethical character;

- Exemptions that include city, county, municipal, and federal employees, exploration geologists, and geologic researchers;
- Provisions for licensure by endorsement;
- Annually published roster of professional geologists;
- Provision to qualify for licensure without passage of a written examination for the first year of the program.

The applicants maintain that licensing geologists will support the protection of the health, safety, and welfare of the public and the environment by ensuring professional competency, as practitioners must meet educational and professional practice standards. In addition, they assert that licensing provides accountability to encourage professional standards of practice.

Regarding public harm, the applicants argue that because geologic services support a wide range of public and private issues, including housing and infrastructure development, the public would both directly and indirectly benefit. Furthermore, failure to recognize geologic hazards and not include them in the engineering and design could contribute to the destruction of public structures or private homes by landslides. The applicants maintain that there is the potential for extensive damage to public streets because of lack of geologic characterization of heaving bedrock and life-threatening rock falls on highways or in mountain housing communities. Lastly, inaccurate or falsified geologic resource assessments such as inaccurate assays and sampling, and incorrect reserve assessments provided to investors or bankers may contribute to economic harm.

Profile of the Profession

Geology, geophysics, and oceanography are closely related fields but there are major differences. The *Occupational Outlook Handbook 2000-01* edition prepared by the U.S. Bureau of Labor Statistics defines a geologist as one who studies the composition, processes, and history of the earth. Geologists attempt to ascertain how rocks were formed and what has happened to them since formation. Geologists also study the evolution of life by analyzing plant and animal fossils. Geophysicists use the principles of physics, mathematics, and chemistry to study not only the earth's surface, but also its internal composition; ground and surface waters; atmosphere; oceans; and its magnetic, electrical, and gravitational forces. Oceanographers use their knowledge of geology and geophysics, in addition to biology and chemistry, to study the world's oceans and coastal waters.

Many geologists, geophysicists, and oceanographers are involved in the search for oil and gas, while other geological scientists are active in preserving and cleaning up the environment.

Numerous subdisciplines or specialties fall under the two major disciplines of geology and geophysics that further differentiate the type of work they perform. For example, petroleum geologists explore for oil and gas deposits by studying and mapping the subsurface of the ocean or land. They use sophisticated geophysical instrumentation, well log data, and computers to interpret geological information. Engineering geologists apply geologic principles to the fields of civil and environmental engineering, offering advice on major construction projects and assisting in environmental remediation, city planning, and natural hazard reduction projects. They work in close coordination with foundation and highway engineers, hydraulic engineers, and hydrologists.

Geologists specifically use their knowledge of the physical composition and history of the earth to locate water, mineral, and energy resources; protect the environment; predict future geologic hazards; and offer advice on construction and land use projects. By using sophisticated instruments and analyses of the earth and water, geologists study the earth's geologic past and present in order to make predictions about its future.

Geologists perform the following functions:

- Provide geologic mapping;
- Assess groundwater quality, quantity and location;
- Provide mineral resources evaluations;
- Provide geologic assessments (resources & hazards);
- Explore for resources including water, energy, and mineral resources.

Education

Formal training for geologists is available as a bachelor's degree, master's degree, or Ph.D. program in hundreds of colleges and universities in the United States. Traditional courses emphasize classical geologic methods and topics, such as mineralogy, paleontology, stratigraphy, and structural geology. Experience with computer modeling, data analysis and integration, digital mapping, remote sensing, and geographic information systems are important.

There are several universities in Colorado offering programs that lead to a degree in geology:

Table 1

Colorado Universities Offering Degrees in Geology

Name of University	Degrees Offered in Geology
Adams State College	B.S.
Colorado College	B.A.
Colorado School of Mines	B.S., M.S. Ph.D.
Colorado State University	B.S., M.S. Ph.D.
Fort Lewis College	B.S.
Mesa State College	B.S.
University of Colorado, Boulder	B.A., M.S., Ph.D.
University of Colorado, Colorado Springs	B.A.
University of Northern Colorado	B.A., M.A.
Western State College	B.S.

Examination

The National Association of State Boards of Geology (ASBOG) is an organization through which state geology registration boards plan and prepare uniform procedures. One of ASBOG's principal services is to develop standardized written examinations for determining qualifications of applicants seeking licensure as professional geologists. State boards of registration are provided with uniform examinations that measure competency related to the practice of the profession.

ASBOG regularly conducts test development and validation workshops using the guidelines established in the *Standards for Educational and Psychological Testing* (1999) published by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education. The examinations are the result of preparation and validation by a committee of professional geologists from throughout the nation. These geologists supply the expertise essential in developing examinations for measuring minimum competency within the profession. By utilizing the expertise of individuals from throughout the nation, ASBOG provides uniform examinations that apply to a wide range of geographic regions and professional practice settings.

Examinations are administered in the spring and fall of each year. Currently, ASBOG provides member boards with two multiple-choice examinations--the Fundamentals of Geology (FG) and the Practice of Geology (PG). Each examination is four hours in length. The FG and PG examinations have been developed to assess common knowledge and skills that relate to the practice of geology throughout the nation. Individual states may require additional testing on local geology, statutes, rules, and regulations that address state-specific issues. The FG Examination emphasizes knowledge and skills that are typically acquired in an academic setting and lead to a baccalaureate degree. The PG Examination emphasizes skills and knowledge that are acquired or expanded in a practice or job setting. The table on the following page illustrates the composition of the two multiple-choice examinations.

Table 2

ASBOG - FG & PG Test Blueprints

Number and Percent of Items by Domain

	Content Domains	FG#	FG%	PG#	PG%
A.	Field Methods And Remote Sensing	32	29.1	28	35.0
B.	Mineralogy, Petrology, Petrography, & Geochemistry	15	13.6	2	2.5
C.	Sedimentology, Stratigraphy, Paleontology	11	10.0	3	3.8
D.	Geomorphology	7	6.4	5	6.3
E.	Structural Geology & Tectonics	10	9.1	2	2.5
F.	Geophysics & Seismology	4	3.6	4	5.0
G.	Hydrogeology	27	24.5	20	25.0
H.	Engineering Geology	3	2.7	9	11.3
I.	Mineral, Petroleum, & Energy Resources	1	0.9	7	8.8
Total		110	100%	80	100%

Source: National Association of State Boards of Geology

Associations

The following are geological organizations and their missions:

American Association of Petroleum Geologists (AAPG)

Since its founding in 1917, the American Association of Petroleum Geologists' mission has been to foster scientific research, to advance the science of geology, to promote technology, and to inspire high professional conduct. Currently the world's largest professional geological society with over 30,000 members in 116 countries, AAPG provides publications, conferences, and educational opportunities to geoscientists and disseminates the most current geological information available to the general public. The local affiliate entitled the Rocky Mountain Association of Geologists (RMAG) has approximately 2,000 members and is one of the most active AAPG affiliates in the country.

American Institute of Professional Geologists (AIPG)
Established in 1963, the primary purpose of AIPG is to strengthen geological science as a profession by promoting ethical conduct and protecting the public and the geological sciences from unprofessional practice. AIPG establishes qualifications for granting of the title, "Certified Professional Geologist," and certifies to the public that those geologists who hold this title have undergone peer review and have been deemed competent practitioners. AIPG has over 5,000 national members in 36 chapters, with the Colorado chapter having approximately 400 members.

Association for Women Geoscientists (AWG)
Created in 1977, the Association for Women Geoscientists is an international organization devoted to enhancing the quality and level of participation of women in the geosciences and to introducing girls and young women to geoscience careers. Today, AWG membership approaches 1,200 with approximately 100 members in Colorado. AWG has chapters in several cities and at-large members throughout the U.S. and around the world.

Association of American State Geologists (AASG)
Established in 1879, the Association of American State Geologists is an organization of the chief executives of the state geological surveys in 50 states and Puerto Rico. The responsibilities of the various state surveys differ from state to state, depending upon the enabling legislation and the traditions under which the survey evolved. Almost all function as a basic information source for their state governments' executive and legislative branches.

Association of Engineering Geologists (AEG)
The Association of Engineering Geologists founded in 1963, was developed to meet the professional needs of geologists who apply their scientific training and experience to the broad field of civil and environmental engineering. The mission of AEG is to provide leadership in the development and application of geologic principles and knowledge to serve engineering, environmental, and public needs. AEG members represent 2,318 (approximately 150 Colorado members) geological engineers and geologists in private practice, academic, and governmental positions.

Denver Geophysical Society (DGS)
The Denver Geophysical Society (approximately 500 members) is a nonprofit organization operated by its members to promote the science of geophysics, especially as it applies to exploration.

Denver Region Exploration Geologists' Society (DREGS)
Founded in 1970 and currently with approximately 230 members, this nonprofit organization promotes scientific communication and interaction through a series of meetings, symposia, field trips and publications.

Society of Economic Geologists (SEG)
Established in 1920, the Society of Economic Geologists is devoted to worldwide advancement of the science of geology, especially scientific investigation of mineral deposits and mineral resources, and application of science in exploration, appraisal, mining, and mineral extraction. The Society's membership includes scientists from industry, academia, and government institutions.

Society of Independent Professional Earth Scientists (SIPES)
The Society of Independent Professional Earth Scientists is a national organization designed exclusively for the independent or consulting professional earth scientist. Members include geologists, engineers, geophysicists, geochemists, and other earth scientists. For members who are consultants, SIPES maintains a computerized referral system for consultants to match consulting members with individuals or companies requiring the services of a qualified earth scientist. SIPES, chartered in 1963, offers a certification program in the earth sciences whereby SIPES' Board of Directors certify members for their professional experience, competence, and ethics. SIPES has over 1,300 members located in 20 states with approximately 150 members in the Colorado section.

Summary of Current Regulation

The Colorado Regulatory Environment

Approximately 400 geologists are members of the Colorado Chapter of the American Institute of Professional Geologists and are "certified professional geologists." In addition, another 1,200 are members of the Rocky Mountain Section of the American Association of Petroleum Geologists and are "certified geologists."

Currently, there is no Colorado statute or local or county law that specifically requires registration or licensure of geologists. There is however, a definition of "geologist" and "professional geologist" found in §34-1-201, C.R.S. Colorado defines a "geologist" as a person engaged in the practice of geology. The law further defines a "professional geologist" as a person having graduated from an accredited university with a minimum of 30 semester (45 quarter) hours of undergraduate or graduate work in a field of geology and post-graduate training specializing in geology with five years of geological experience. There are no enforcement mechanisms contained in Title 34, Part 2. However, contact with a representative of the Colorado Office of the Attorney General reveals that in all likelihood that misuse of the above terms would constitute a deceptive trade practice subject to action under the Colorado Consumer Protection Act.

Several Colorado statutory citations and/or state regulations specify requirements for the submission of geologic suitability reports in conjunction with land-use applications. Other statutes address the disclosure of hazards/and or soil conditions to new homebuyers. For example, §30-28-133 and §30-28-136, C.R.S., (County Planning and Building Codes) require subdividers or developers to submit reports to county planning agencies concerning geologic characteristics of the area, potential radiation hazards, soil suitability, story drainage plans, on-lot sewage disposal, and any soil or topographic conditions that present hazards or require special precautions. The subdivider or developer must identify areas of a proposed subdivision where such relevant site characteristics exist, and the proposed uses of those areas should be shown to be compatible with such conditions. County planning agencies are required to submit a copy of the preliminary plan and geologic suitability plan submittal to the Colorado Geological Survey for review.

In addition, §24-65.1-202, C.R.S. (Criteria for Administration of Areas of State Interest) requires that all developments in areas designated by counties as geological hazard areas be engineered and administered in a manner that will minimize significant hazards to public health and safety or to property. Local governments are instructed to administer such areas in a manner that is consistent with model geologic hazard area control regulations created by the Colorado Geological Survey, for land use in each type of natural hazard area.

The State Board of Education is required to submit reports regarding geologic suitability for raw land purchases, new school plans, and improvements to existing schools to the Colorado Geological Survey according to §22-32-124, C.R.S. In addition, Colorado law (§34-1-202, C.R.S.) requires that any geologic report required by law that is presented to, or prepared by, any state agency, political subdivision of the state or recognized state or local board or commission must be prepared or approved by a "professional geologist."

Colorado Geological Survey

The Colorado Geological Survey (CGS) is charged with evaluating geologic factors that would have significant impact on the proposed use of the land for subdivision purposes by reviewing preliminary plat applications. CGS conducts a variety of special-use reviews and provides technical assistance to county and city governments, school districts, and water and sanitation districts and quasi-government agencies upon request. Subdivision reviews account for a majority of CGS review activities. The CGS is authorized to establish and collect fees to recover direct costs of providing review services.

For most cases, the CGS receives and reviews geologic or geotechnical reports, drainage reports, and plat maps submitted for proposed subdivisions. A CGS engineering geologist visits the actual subdivision site and performs an inspection. The reviewer submits this report that may include the following responses to the local government planning agency:

1. The submitted findings and recommendations are completely adequate;

2. The submitted findings and recommendations are mostly adequate, and additional suggestions are given;

3. More information is needed because potentially serious geologic problems were not sufficiently recognized or addressed;

4. The project is infeasible for geologic and/or other technical reasons.

CGS reviews are advisory in nature and are, therefore, nonbinding. The local governmental planning agency may choose to disregard the review, although this seldom happens. Primarily the state of planning, complexity of the project, and/or the severity of geologic constraints determine the extent of the review. Each site generally has unique geologic conditions and must be investigated and reported accordingly.

Professional Standards of Practice

In Colorado, there is presently an issue concerning the boundaries and overlap between the professions of engineers and geologists. Some practitioners qualify as both, but most are either geologists or engineers. Professional geologists and professional engineers work collaboratively on many projects. Generally, professional geologists focus on characterizing and interpreting the earth's constituents (i.e. rock, soil, minerals, solids, groundwater, surface water, and gases) and impacts associated with both natural processes that act upon earth's materials. Professional engineers whose area of expertise leads them to work with earth processes and materials (i.e. civil, environmental, geotechnical engineering) focus primarily on assessing and interpreting conditions from the standpoint of developing systems or designing solutions that mitigate an adverse impact.[1]

Concern has been expressed by professional geologists that reports containing geologic information are not prepared or approved by a qualified geologist as required in §34-1-2-2, C.R.S. The Colorado Board of Registration for Professional Engineers and Professional Land Surveyors has issued a policy statement (see Appendix A) that lists key guidelines and limitations for engineering in designated natural hazard areas.

[1] New Hampshire Council of Professional Geologists, Response to Sunrise Questionnaire, 2000.

During interviews with geologists as part of this sunrise review, geologists argued that there are engineers performing geological work outside their scope of practice for engineering. Furthermore, because a licensing law for geologists does not exist, there are no remedies to discipline these engineers. Complaint records of the Board of Registration for Professional Engineers and Professional Land Surveyors were reviewed to determine whether there were any complaints or discipline imposed against engineers regarding this issue. These records indicate that from 1993-1999 there were seven general complaints to the Board regarding engineers practicing outside their scope of practice. Upon investigation, two of the seven cases involved the practice of geology. The first case alleged that the engineer was practicing professional geology without appropriate qualifications and therefore practicing outside his area of expertise. Upon investigation and review, the Board dismissed the complaint for lack of apparent license law violation. The second case concerned the joint practice of a professional engineer and a professional geologist. The professional engineer was subsequently disciplined for not meeting expected "standards of practice" in his work.

Colorado Consumer Protection Act

The Colorado Consumer Protection Act [§6-1-105(1)(b)), (c), (e), and (l), C.R.S.] prohibits individuals from misrepresenting their certification, abilities, and associations and making false or misleading statements concerning the price of goods, services, or property. In addition, §6-1-707(1)(a)(I), C.R.S. prohibits an individual from claiming "either orally or in writing, to possess either an academic degree or an honorary degree of the title associated with said degree, unless the person has, in fact, been awarded said degree." While this law does not prohibit individuals from performing geological services, it does prohibit individuals from claiming that they have an education or background they do not possess.

Regulation in Other States

Regulation of geologists, either by title protection or by a practice act, currently exists in 28 states. Of the 28 jurisdictions that regulate geologists, two states have established title protection, one state has established certification based on American Institute of Professional Geologists certification, and 25 states have licensing acts. Of the two states with title protection acts, one also has provisions for disciplinary actions.

The requirements for geologists vary from state to state which creates problems for geologists who work on more than intra-state projects. Though many states rely upon tests provided by one of the many professional organizations, there is no universal test that is consistently applied and administered. The National Association of State Boards of Geology (ASBOG) has created a test with the help of testing professionals and geologists in the country. This test is currently being used in 23 states. It is considered by some to be very effective but critics argue that it should be revised. Opponents argue that the ASBOG test requires applicants to memorize readily available formulas and conversion factors. Few geologists would rely upon memory knowing that a small miscalculation could result in serious problems for both the client and their practice. Rather, geologists contend that this section should be designed similar to the engineering exam that contains an open book portion that deals with formulas and other sensitive data. Another complaint is the lack of consideration given to specialization in the ASBOG exam. The ASBOG test is also criticized for not focusing enough on basic science skills.

DORA contacted representatives of all 28 states to determine the level of complaint and disciplinary activity imposed on geologists. The primary findings from the state licensing boards and divisions were that there were a minimal number of complaints filed against geologists and relatively few or no disciplinary actions imposed. The exception is the State of California that has received 200 complaints since 1992 resulting in 20 fines imposed, one cease and desist, and one revocation. A California official reports that they currently have 80 open cases.

The two tables on the following pages summarize the regulation of geologists in other states. Table 3 includes educational and examination requirements, continuing education requirements, and various provisions for exemptions. Table 4 summarizes complaint and disciplinary actions for states that regulate geologists.

Table 3

Comparison of Other States' Regulation of Geologists

State	Requirements							Authority			Exemptions					
	BS/BA Geoscience	BS/BA Engineering	Minimum Credit Hours (Semester)	Work Experience (years post BS/BA)	Fundamentals Exam	Practice Exam	Continuing Education Requirements	Effective Date of Law	Practice Agreement (PE's)	Waiver of Examination	State/Municipal Employees	Subordinates	Engineers	Teaching/Research	Other Professionals	Exploration/Non-Public
Alabama	Y	Y	30	5	AS	AS	Y	1995	Y	Y	X	X	X	X	X	X
Arizona				8	AS	AS		1956	Y	Y		X		X		X
Arkansas			30	7	AS	AS		1988			X	X		X		X
California	Y		30	5	Y	Y		1968		Y		X	X	X	X	X
Delaware	Y		30	5	AS	AS	Y	1972				X		X		
Florida	Y		30	5	AS	AS		1987	Y	Y		X	X		X	X
Georgia	Y		30	5	AS	AS		1975	Y	Y		X		X		X
Illinois	Y		30	4	AS	AS		1996		Y		X	X	X	X	X
Indiana	Y	Y	30	5	AS	AS		1980			X	X	X	X	X	X
Kansas	Y	Y	30	4	AS	AS		1997				X		X		X
Kentucky	Y	Y	30	5	AS	AS		1992			X	X	X	X		
Maine	Y		30	7	AS	AS		1973		Y	X	X	X			
Minnesota	Y	Y	30	5	AS	AS		1997	Y	Y		X	X	X	X	X
Mississippi	Y		30	4	AS	AS		1997	Y	Y		X				X
Missouri	Y	Y	30	3	AS	AS		1994		Y		X	X	X	X	X
Nebraska	Y		5	AS	AS			1999								X
North Carolina	Y	Y	30	5	AS	AS		1984	Y	Y	X	X	X	X	X	
Oregon	Y		30	5	AS	AS		1977	Y			X			X	X
Pennsylvania	Y		30	5	AS	AS		1993	Y	Y		X	X	X	X	X
South Carolina	Y		30	5	AS	AS	Y	1986	Y	Y		X	X	X	X	
Virginia	Y		30	3	AS	AS		1981			X	X	X	X	X	X
Wisconsin	Y	Y	30	5	AS	AS		1994		Y		X	X	X	X	X
Wyoming	Y		30	4	AS	AS		1991/ 1997	Y	Y		X	X	X	X	X
Non-Member States with Regulation																
Alaska (AIPG)	Y	Y	36	5				1980		Y						
Idaho			30	5	AS			1971								
New Hampshire	Y	Y	30		AS	Y	Y	2000								
Tennessee	Y		30	5				1988				X	X	X	X	
Washington	Y			5	Y	Y		2001				X	X	X	X	X
Professional Society Certification																
AIPG	Y	Y	36	5												
AAPG, DPA	Y	Y	30	8												
SIPES	Y	Y		12												

Source: National Association of State Boards of Geology (October 2000)

(Key: AS= ASBOG Examination, Y = Yes)

Table 4

Comparison of Other States' Complaint and Disciplinary Histories

State	Number of Geologists	Type of Regulatory Program	Number of Complaints	Nature of Complaints	Disciplinary Actions
AL	800	Licensure	10	Involving Professional Engineers	None
AK	526	Certification based on AIPG certification	None		None
AZ	773	Registration	1999-1 1998-1	Practicing w/o registration Practicing w/o registration	Assurance of discontinuance Assurance of discontinuance
AR	1007	Licensure	2	Practicing w/o a license	None
CA	4200 RG 1500 CEG 700 CH 300 RGP	Licensure	200 since 1992	Fraud, negligence, unlicensed practice	Currently have 80 open cases. Utilized fining authority 20 times in last 3 years. One revocation in 2000 for negligence and incompetence. One cease and desist in 1999
DE	546	Licensure	1997-2001 None		None
FL	2170	Licensure	40	1 – Improper seal 1 - Fraudulent license 3 – False statements 3 – Violating provision of statute 5 – Gross negligence 7 – No violation – case closed	Three complaints resulted in filing of administrative complaints. Result = 1 dismissal, 1 letter of guidance, and 1 voluntary relinquishment. Remainder of complaints was dismissed.
GA	1073	Registration	Not provided		Not provided
ID	710	Licensure	1972-1992 (2) 1992- 3/year	Substandard practice Unlicensed practice	None
IL	890	Licensure	Not available	Not available	1997-2001 None
IN	2024	Licensure	None		None
KS	478	Licensure	Not provided		Not provided
KY	1897	Licensure	Not available	Not available	Not available
ME	248	Licensure	12	Not available	None
MN	585	Licensure	3	Not available	2000 –1 Stipulation and Order for anticompetitive activity, making false claims, and falsifying billing.
MS	650	Licensure	2	Unlicensed practice	Both cases disciplined
MO	802	Licensure	1996-2001 (5)	Unlicensed practice, fraud, and malpractice	None

RG-Registered Geologists CEG-Certified Engineering Geologists CH-Certified Hydrogeologists RGP-Registered Geophysicists

State	Number of Geologists	Type of Regulatory Program	Number of Complaints	Nature of Complaints	Disciplinary Actions
NE	220	Licensure	None		None
NH	Not available	Licensure	Recently completed administrative rules. Law enacted 8/2000 – will begin licensing soon		
NC	1205	Licensure	Not provided		Not provided
OR	1200	Licensure	1999-2001 (1/month)	Unlicensed practice	Suspended a CEG registration. Issued civil penalties for lapsed license, poor report quality, and practicing outside scope.
PA	2681	Licensure	Not available		Yes/No tracking system
SC	587	Licensure	Not provided		Not provided
TN	Not provided	Title Protection	Not provided		Not provided
VI	857	Title Protection Voluntary certification	None		1995-2001 - None
WA	Not available	Licensure	Program effective July 2001.		
WI	1082	Licensure	Not provided		Not provided
WY	3500	Licensure	5 since 1997 (3 dismissed)	Unlicensed practice Violations of Code of Professional Conduct	1 Cease and desist 1 Application denied because of fraudulent information.

Analysis and Recommendations

The sunrise criteria are very clear and specific regarding justification for the creation of a new regulatory program. The burden is upon the applicants to document through the application process that the occupation or profession being considered meets all three criteria.

Public Harm

The first sunrise criterion asks:

Whether the unregulated practice of the occupation or profession clearly harms or endangers the health, safety, or welfare of the public, and whether the potential for the harm is easily recognizable and not remote or dependent upon tenuous argument.

The applicants have not submitted specific incidences in Colorado demonstrating that harm to the public has occurred, or that the public is endangered by the threat of potential harm from the unregulated practice of geologists. While allowing that documenting financial and physical harm may be difficult, this review found no evidence of harm being caused to Colorado consumers by the unregulated practice of geologists. Further, no persuasive evidence has been submitted to justify the concern that actual or potential measurable harm exists in the geology field that would be solved by the imposition of a licensing scheme. In addition, 16 organizations, agencies, and departments were sent letters soliciting input to determine real or potential harm to the public by the unregulated practice of geologists. Only five responses were received.

Of the responses, the American Institute of Professional Geologists submitted a letter supporting licensure of geologists in Colorado. However, both the Colorado Petroleum Association and the Colorado Oil & Gas Association expressed their view that any licensure program for geologists should completely exempt geologists engaged in natural resource extraction, including all work with application to the oil and gas industry. They further state that this industry is highly regulated and that further regulation of geologists employed in the oil and gas industry is unnecessary. In addition to the above correspondence, DORA received two letters from practicing geologists regarding the proposal to regulate geologists. Those letters are included in Appendix B.

The Department investigated the types and numbers of complaints received by the Denver/Boulder Better Business Bureau; the Office of the Attorney General, Consumer Protection Section; the Board of Registration for Professional Engineers and Professional Land Surveyors; the Governor's Advocacy Office; and the Denver District Attorney's Office, Economic Crime Unit. The Board of Registration for Professional Engineers and Professional Land Surveyors (Board) is the only agency that has received complaints regarding geologists or geological work.

DORA reviewed seven complaints submitted to the Board regarding "standards of practice" and "performing services beyond one's competency, training, or education." Only two of these seven complaints involved a practicing geologist. The data below illustrates the nature and disposition of these complaints.

Case 1

Date: 1993

Professions Involved: Professional Geologist and Licensed Professional Engineer.

Complaint Description: Design relating to the liner and leachate collection system for a landfill was substandard. Design did not conform to generally accepted standards of soils engineering practice. Professional geologist had signed report because he was principal author. The reports did not require signature or seal of a Professional Engineer. However, the Professional Engineer signed and sealed a report that was not prepared under his complete direction and control.

Disposition: Determined that the work did not meet expected "standards of practice." Board issued a Letter of Admonition; limitation of practice; and continuing education to the licensed Professional Engineer.

Statutory Cite: §12-25-117(3), C.R.S. Rules of Professional Conduct II.1.B.

Case 2

Date: 1999

Professions Involved: Licensed Professional Engineer

Complaint Description: Practicing professional geology without appropriate qualifications and therefore practicing outside area of expertise for a professional engineer. Failed to follow the standard of practice by omitting recommendations for engineering geology inspections during development, grading, and construction of the project.

Disposition: Dismissed.

Regarding Case 1, both a professional geologist and a professional engineer working together designed a linear disposal site (landfill) that was determined to be of substandard quality. The professional engineer was subsequently disciplined. It is reasonable to conclude that were there a licensure program for professional geologists, this individual would also have been disciplined. In Case 2, the allegations that a licensed Professional Engineer was practicing professional geology without appropriate qualifications and therefore practicing outside area of expertise for a professional engineer was dismissed.

Need for Regulation

The second sunrise criterion asks:

Whether the public needs, and can be reasonably expected to benefit from an assurance of initial and continuing professional or occupational competence.

It is difficult to see a benefit to the public in regulating geologists. From research conducted, it appears that persons in the marketplace who utilize the services of geologists do not have complaints regarding the lack of a licensure program in Colorado. Most cases of geology-related damage to public and private facilities, or cases where potential damage has been averted, has involved reports done by licensed professional engineers who do not understand the geological conditions.

There has been no evidence supplied by the applicants that the public needs or demands this type of regulation. Additionally, the Colorado Revised Statutes already provide for a definition of "professional geologist" and specify what types of documents must be reviewed by a professional geologist. Nor did DORA find any shortage of trained practitioners offering services to the public in this area. The Colorado Department of Labor and Employment reports in their publication *Occupational Supply/Demand Report July 1998 – June 1999*, that there is a significant oversupply of applicants to the openings in the field of geology.

Results of Regulation in Other States Do Not Support the Argument to Regulate in Colorado.

The lack of need to regulate geologists in Colorado is supported by contact with other states that have chosen to regulate in this area as illustrated in Table 4 on page 17 of this report. Of the 28 states with regulation, four have not received any complaints nor taken any disciplinary action and 10 additional states have not taken any disciplinary action on their few complaints. Complaint activity is low in general and the majority of complaints received involve practicing without a license. There is no reason to expect that the Colorado experience will be any different if it chooses to regulate geologists.

Other Issues to be Considered

Scope of Exemptions

The applicants propose that exemptions for licensure include city, county, municipal, and federal employees; exploration geologists; and geologic researchers. As mentioned previously, both the Colorado Petroleum Association and the Colorado Oil & Gas Association expressed their view that any licensure program for geologists should completely exempt geologists engaged in natural resources extraction, including all work with application to the oil and gas industry. They further state that this industry is highly regulated and further regulation of geologists employed in the oil and gas industry is unnecessary. An opposing view expressed by one geologist contacted during this review contends that exploration geologists should not be exempt from a licensure program for their actions impact such essentials as surface and groundwater resources and the structural stability of mines and wells.

Proposal for a Grandfathering Clause

During several discussions with the applicant, the concept of a grandfather clause was presented. Grandfathering by definition permits the unqualified to practice a profession without having fulfilled the basic requirements of regulation. If the legislature has determined that basic minimum requirements are necessary to protect and public's health, safety, and welfare, then all applicants for licensure should be required to satisfy these basic entry standards. While several states provided for a one-year grandfather clause, a majority of states with a regulatory program did not provide for a grandfathering provision and the Colorado Legislature has historically rejected grandfathering when creating new regulatory programs.

Alternatives to Regulation

The third sunrise criterion asks:

Whether the public can be adequately protected by other means in a more cost-effective manner.

Current Colorado statutes provide penalties for persons involved in deceptive advertising and fraud. Falsely representing the association affiliation of a practitioner violates the Colorado Consumer Protection Act (§6-1-101, et seq., C.R.S.). Such violations also include false claims concerning educational degrees (§6-1-707, C.R.S.).

If regulation were to be imposed by the legislature, the cost of such regulation would be dependent upon a number of issues such as:

1. The establishment of a Board of Geologists;

2. The amalgamation of geologists with an existing Board;

3. The numbers of geologists in Colorado who would become licensed;

4. The type of regulation imposed;

5. The establishment of a new examination or usage of the National Association of State Boards of Geology (ASBOG examination);

6. The requirements necessary to ensure initial or continuing competency within the profession;

7. Other matters to be considered by the Board such as handling of complaints and rulemaking.

Our research leads us to conclude that in Colorado, market forces are the most cost effective way to adequately protect the public's health, safety, and welfare in regards to the practice of geology.

Private Credentials

Private certification is offered by professional organizations such as the American Institute of Professional Geologists (AIPG), the American Association of Petroleum Geologists (AAPG), and the Society of Independent Professional Earth Scientists (SIPES). The AIPG establishes qualifications for granting of the title, "Certified Professional Geologist," and certifies to the public that those geologists who hold this title have undergone peer review and have been deemed competent practitioners. Further, the AIPG continuously evaluates the ethical conduct of geologists and establishes ethical standards to protect the public from non-professional practices.

The designations "Certified Petroleum Geologist" (CPG), "Certified Coal Geologist" (CCG), and "Certified Petroleum Geophysicist" are used by the AAPG. Applicants for active membership in the AAPG must have a bachelor's degree in the geological sciences and a minimum of three years experience in the professional practice or teaching of geology. Certification as a CPG, CCG, or a petroleum geophysicist requires a special application and is not automatic with membership in AAPG. The five page application for any of the three certifications is in the form of an affidavit and requests the following information:

- Training – graduation from an institution approved by the Division of Professional Affairs with a major study in geology (or other relevant disciplines), with a minimum of 30 semester hours in geology or the equivalent;

- Experience – minimum of eight years practicing in the profession;

- Personal Integrity, Responsibility, and Professional Ability – sustained record of adherence to professional and ethical standards of the Code of Ethics of AAPG;

- Sponsors – submission of three sponsors names (preferably AAPG certified) who will attest to applicant's professional and ethical qualifications;

- References (Non-geologists) – three individuals who are responsible members of the community in which the applicant resides or conducts business;

- Skills Information Sheet – requires list of continuing education seminars and indication of skill level for a list of disciplines relevant to the certification.

This type of extensive private credential availability augments competitive market forces to protect the public.

Conclusion

Given the data submitted and obtained during this review and that the unregulated practice of geologists has not resulted in significant harm to Colorado consumers, this sunrise review contends that regulation of the occupation is not necessary. The applicants have not demonstrated that the unregulated practice of geology within Colorado clearly harms or endangers the health, safety, and welfare of the public.

Although the profession is regulated in some states, contact with these states demonstrates that complaint and disciplinary activity is low. Results of regulation in other states do not support the argument to regulate in Colorado.

No persuasive evidence has been submitted to justify the assertion that actual or potential measurable harm exists from geologists practicing in Colorado without a license. The existing state law that defines "professional geologist" and requires such to be involved in certain land use suitability reports, coupled with the private credential available through the American Institute of Professional Geologists, the American Association of Petroleum Geologists, and the Society of Independent Professional Earth Scientists provides adequate oversight.

Recommendation 1 - The General Assembly should not license or otherwise regulate geologists.

Appendix A – Colorado Board of Registration for Professional Engineers and Professional Land Surveyors Policy Statement

ATTACHMENT 1

Policy Statement 15
Engineering in Designated Natural Hazard Areas

(Source: Colorado BRPEPLS, 1998)

In areas having "Natural Hazards" in accordance with section 24-65.1-101 et seq., C.R.S., such as expansive soil and rock, corrosive soils and unstable slopes, engineers performing soils (geotechnical) investigations, construction observation, and design of structures including foundations, grading and drainage, buried utilities, streets and pavements, and remedial work to these improvements shall demonstrate knowledge and incorporate knowledge of and expertise in: 1) methods used to mitigate such hazards and, 2) investigation, design and construction guidelines adopted by local governments.

It is the opinion of the Board that this policy statement should be implemented by the following guidelines:

1. Recognition and Mitigation of Natural Hazards

Registrants should be thoroughly familiar with applicable natural hazard legislation and local government policies and regulations for the mitigation of effects of natural hazards. Local government policies and regulations may vary. It is the responsibility of each registrant to become familiar with the applicable policies and regulations. Local government policies and regulations, or lack thereof, concerning natural hazards do not relieve the registrant of sound engineering practice in the recognition and mitigation of natural hazards.

2. Multi-Disciplinary Approach

Registrants should recognize and acknowledge that the mitigation of effects from natural hazards requires a multi-disciplinary approach encompassing the fields of engineering, geology, hydrology, architecture, and land-use planning. It is incumbent on the registrant that these fields are adequately represented in the mitigation of natural hazards through demonstrated knowledge and experience. In general, the Board believes that individual registrants are unlikely to possess the necessary knowledge and expertise to deal with all natural hazards in all cases.

3. Education

Knowledge of natural hazards should be demonstrated by attendance at courses on natural hazards sponsored by the Colorado Geological Survey, universities, local government, or professional societies. Registrants should be prepared to demonstrate appropriate knowledge and expertise.

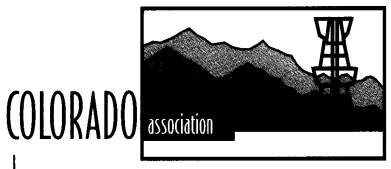
4. Disclosure

Registrants should be open and forthright about the existence of natural hazards, risks to their clients and the public, methods of mitigation, and the chances of success in mitigation. This applies to all stages of the design process, from feasibility through final design and construction. Registrants should not knowingly take part in remedial work in natural hazard areas where the intent is to disguise either the hazards or existing damage.

(Adopted 02-20-95/Revised 08-07-98)

9

Appendix B – Letters in Opposition to Regulation of Geologists



October 1, 2001

Ms. Zoe Henry
Department of Regulatory Agencies
1560 Broadway, Suite 1550
Denver, Colorado 80202

Dear Zoe:

The Colorado Petroleum Association (CPA) strongly opposes efforts to license geologists. CPA represents companies from all segments of the oil and gas industry ranging from those engaged in exploration and production activities to remediation of petroleum storage tanks. CPA generally opposes the regulation or licensing of professionals who interact with industry absent a clear health and safety need. Colorado's comprehensive laws governing oil and gas development protect the environmental health and safety concerns related to those activities.

Licensing of geologist will substantially raise our members' cost of conducting business. CPA is particularly concerned that individuals working for companies located out of state would be subject to this new licensure scheme. Our members are well qualified to determine for themselves who is and isn't qualified to conduct geology services.

Thank you for considering CPA's thoughts on this issue.

Sincerely,

Stan Dempsey
President

1410 Grant Street, C207, Denver, CO 80203 t: 303.860.0099 f: 303.860.0310 e: cpa@1410grant.com

Henry, Zoe

From: CNORRISGHI@aol.com
Sent: Thursday, April 19, 2001 11:34 AM
To: zoe.henry@state.co.us
Subject: Let's try this again

Zoe,

Here are some comments on mineral geology and petroleum geology. Hope this meets your needs. If not, don't hesitate to call me at either (303) 322-3171 or (847) 635-8335). I'll be sending you my newsletter op-eds another day.

Mineral Geology and Public Health Safety and Welfare

If mineral geologists did nothing but take field measurements and calculate reserves, there might be minimal impact to the public health safety and welfare. But, they do more than that. If the only geology being done associated with mineral extraction were field measurements and reserve calculations, there might be minimal to the public health safety and welfare. But, there is considerable more geologic effort required than that. The exemption in the proposed law for those doing geologic activity for the extraction industry and for geologists who work in the extraction industry leaves public health, safety and welfare at substantial risk.

Geologic effort in the extraction industry (mineral mining, coal mining, uranium mining, gravel mining, etc.) goes far beyond just identifying the mineral or resource reserves. At present, the activities may or may not be being done by a geologist, but they presumably should be, and by a qualified one.

Exploration for mining itself generates some risk. One of the most common of exploration tools is drilling to obtain subsurface data. Drill holes that are not properly abandoned are conduits for water flow into the ground, potentially contaminating ground water resources, or water flow out of the ground, potentially contaminating surface water resources or depleting ground water resources.

If the person doing exploration geology pays attention only to the rock and not to the quantity and quality of surface and ground water (including seasonal variations), there is the risk that surface or ground water resources by be put at risk of depletion or degradation.

If the person doing exploration geology pays attention only to ore rock and not the entire rock section to be impacted by mining, non-ore rock that is reactive and will weather aggressively when exposed by mining may not be identified. Such oversights are historically the cause of acid mine drainage problems in both mineral and coal mining operations. The volume, location, and reactivity of exposed non-ore overburden or waste rock must be identified and an appropriate plan developed for its management. A qualified geologist should be central to this work.

If the person doing exploration geology focuses on ore and ignores geologic structure or stratigraphy, there may be catastrophic consequences. Structures such as faults or fracture are zones of weathering, zones of actual or potential movement, zones of weakness and zones of preferred water flow. Changes in rock layering above or below a potential mine or lateral to an ore body can impact the structural stability of the mine during and after excavation. Not accurately mapping such features can result in mine flooding, mine collapse, and surface subsidence, any one of which can be sudden and/or severe and any one of which can impact not only the mine and mine staff, but also persons or the environment in the vicinity of the mine.

Mine development and excavation inherently involves the interaction of

engineering activities with geology. If the person doing the development geology is not competent, disaster can result. Underground mines or open pits may be unstable and collapse, processes that can be progressive or catastrophic. Overlying, underlying or adjacent water resources may be damaged, rerouted and/or contaminated. It should be noted that contamination may not just be chemical, in many mining situations, it can also be thermal. With some types of mining, particularly coal or oil shale, gas migration from the mine site can create ground water contamination and/or risks of explosion. This dangers place both the mine employees and the general public and environment at risk.

The need for competent geologic expertise extends beyond the limits of the mine, as well. Most mines are installed in fairly to extremely remote settings. Access roads, and sometimes rail lines, for personnel, equipment, supplies, utilities, and production from the mine must be built, as well as plant facilities, ore enrichment facilities, and storage areas. All of this construction requires the integration of geology and engineering to accomplish safely. The person doing the geology for this access and infrastructure must be competent or failures of the system(s) may occur.

Oil and gas exploration has a similar set of activities and efforts that continually require a competent interpretation of the geology of a particular site or activity. I won't go into the details to the extent I have with the extraction industry unless you need it at a later date. Seismic exploration for hydrocarbon resources puts surface water and shallow ground water resources as risk, as well as the wells used to produce the shallow ground water and foundations of buildings in the vicinity. Wells drilled for either exploration or production are inherently capable of taking or destroying water resources for potable or irrigation uses; the expertise to recognize the vulnerable resources and pick the appropriate casing points on wells is geologic. Proper well design and casing programs requires understanding the stratigraphy, structure and the physical characteristics of the well bore itself. Without the understanding, cross-formational contamination, water resource contamination, well collapse, and blow-outs are all possible.

Oil field brines are produced with oil and gas. The proper disposal of the brines, whether in the surface or subsurface is a problem of geochemistry. The brines are sometimes disposed of by injection. Water floods and other types of secondary and tertiary recovery inject fluids into the subsurface. The control and containment of these fluids requires geologic expertise. Failing to control these fluids puts a host of environments and potentially individuals at risk.

Access to exploration wells, oil fields, and production facilities requires construction that, as with mining, requires geologic input. Storage facilities without adequate foundations can result in wide-spread soil, surface water and ground water contamination. The now-active exploration for, and development of, coal-bed methane using wells is an oil and gas activity that already has show its capacity for inadequate geology to damage the public health safety and welfare. In adequate understanding of the processes and effects of desorbing the methane from coal beds has lead to the migration of the evolved methane for distances of tens of miles from the production center to outcrops and subcrops, causing impacts from water contamination, to air contamination, to explosions and burnings of residences and other buildings.

And the list goes on.

Hope this helps. Chuck

Trevor R. Ellis

600 Gaylord St, Denver, CO 80206-3717, USA
Tel: +1 303 399 4361 Fax: +1 303 399 3151
e-mail: ellis@minevaluation.com

July 28, 2001

Attention: Zoe Henry
Policy Analyst
Department of Regulatory Agencies
Office of Policy and Research
1560 Broadway, Suite 1550
Denver, CO 80202
Also by e-mail to: Zoe.Henry@dora.state.co.us

RE: Statement in Opposition to the Proposal to Regulate Colorado Geologists

Thank you for your e-mail of June 18th inviting me to submit a statement to your sunrise review regarding the proposal to regulate geologists in Colorado. I am sorry for the delay in responding due to family vacation travel and my very heavy volunteer commitment as the U.S. representative and leader of the Extractive Industries Task Force for the International Valuation Standards Committee.

As a brief introductory background, I am a Denver-based consulting geologist with 30 years of professional mining industry experience. My specialty is evaluation and market value appraisal of mineral properties, which work I do nationally and internationally. My Masters Degree is from the Colorado School of Mines. I am a Certified Professional Geologist with The American Institute of Professional Geologists, a Certified Minerals Appraiser with the American Institute of Minerals Appraisers of which I am President (both Colorado-based national institutes), and a Fellow of The Australasian Institute of Mining and Metallurgy, the leading international mining industry institute. I am also a Registered Geologist in Kentucky, a Certified Geologist in Alaska, and a Chartered Professional Geologist in Australia. I have applied for licensing as a Professional Geologist in Wyoming and have paid the $275 fee to take the National Association of State Boards of Geology (ASBOG) exams in Laramie in September.

As you are aware, I am strongly opposed to the concept of state level licensure, particularly as it is applied to geologists in the 25 or more U.S. states that already have geologist licensure. You heard many of my reasons for opposing such regulation when I spoke as a panel member at the The American Institute of Professional Geologists (AIPG) sponsored discussion of the proposed geologist licensure statute, November 29, 2000, at The University Club. You have also read my recent paper on geologist licensure, *International Challenges will Confront State Licensure.*[1] I attach a copy here as part of this submission. In this paper I argue that state licensure of professionals is an unjustifiable barrier to free national and international trade in professional services. State licensure goes against international trends for administering professionals at the national level,

[1] Ellis, Trevor R., "International Challenges will Confront State Licensure," *The Professional Geologist*, AIPG, Vol. 37, No. 11, December 2000, pages 10-13.

generally by professional institutes. It violates the basic principles of free trade in professional services of the North American Free Trade Agreement (NAFTA) and the World Trade Organisation's General Agreement on Trade in Services (GATS), the U.S. being a signatory to both agreements. State licensure provides professionals with guild protection which cannot be justified, because the costs outweigh the benefits to the public. Supporting this position, I quoted conclusions from a paper, *Restrictions on Trade in Professional Services*, published by Australia's Productivity Commission, a comprehensive analysis of the economic effects of regulations in about 30 countries, including the U.S., that is based partially on an extensive review of international research literature.[2] The document clearly demonstrates the increased price to the U.S. consumer from domestic trade barriers such as state licensure. From reviewing the literature, the author concludes (page 10), "... the bulk of the literature indicates that restrictions can increase prices without offsetting benefits of improved quality." I have provided you with a copy of this important reference.

The primary justification that I have heard for licensure of Colorado geologists is that licensed engineers are often given responsibility for geological work, because they are licensed and geologists are not. I do believe that this occurs sometimes in specialties such as rock mechanics for foundation and slope stability studies, hydrogeology and environmental geology. Rather than this being a reason for licensing of geologists, I view it as an additional reason to abolish state licensure of engineers. There may be some cases where consumers or the public in Colorado would have been prevented from suffering harm if a state licensed geologist had been responsible for the work instead of an engineer or an unqualified person. However state licensure does not provide any guarantee of competency in the specific aspect of geological work being conducted on a project. In fact, it is a barrier that I have run up against on a number of occasions, stopping highly qualified and competent specialists from working across state lines, thereby acting against the welfare of the consumer and the public.

If state licensure of geologists is introduced, my observation and personal experience from how it has been enforced against me in other states, is that it will have many negative (unintended) consequences. As evidence, I submit the attached letter I wrote last year to Kentucky's Board of Registration for Professional Geologists. In it I complain that although I am registered in Kentucky, the barriers of strict rules interpretation by the professional geologist boards in other states is preventing me from obtaining contracts in my field of work involving mineral properties in those states.

As I state in the letter, my work generally involves a one-day inspection of the mineral property (mine or quarry), then I return to my home office in Colorado to analyze the geological and economic data, and write the report. Although it is often claimed that the geologist licensure statutes of the various states exempt geologists working in the mining industry, I have yet to find a statute under which my work is exempt when narrow interpretation is applied. This includes the proposed Colorado statute. State level guild protection has often resulted in narrow interpretations being applied against me. I have no reason to expect that Colorado's implementation would be different, preventing competent out-of-state professionals from working here, or possibly even preventing

[2] Nguyen-Hong, Duc, "Restrictions on Trade in Professional Services," Productivity Commission Staff Research Paper, AusInfo, Canberra, Australia, August 2000, 83 pages, available at www.pc.gov.au.

them from working on a Colorado project without entering the state. The result is that competent, high integrity, law abiding professionals are prevented from working in their specialty, while persons with less integrity who are willing to ignore the law are rarely brought before a Board for reprimand or punishment.

It is possible that the wording of the proposed Colorado statute might be modified so as to ensure an interpretation that my work in the mining industry is exempt. However, my experience is that this probably would not prevent a practical need for many independent geological consultants such as myself to become licensed. On numerous occasions I have lost potential work on mineral properties in other states because the clients perceived that a professional licensed in the state might be legally required, despite my attempts to convince them this was probably not the case.

In the attached letter, I raise the very frustrating issue of me finding it necessary to take the ASBOG exams 30 years after graduating with my geology degree. I will be attempting the exams in Laramie, Wyoming in September. Colorado would require passing the ASBOG exams to obtain state licensure as a Professional Geologist. You have advised us that there will be no grandfathering provision to allow practicing professionals to become licensed without taking the exams. The exams test the broad field of geology, with concentration on aspects related to the practice of engineering geology, hydrogeology and environmental geology. Such broad coverage exams are most easily passed within a few years of graduation. Being a senior professional, I now only practice in a tiny, niche specialty of geology, that of appraising the value of mineral properties. There is not a single question on this specialty in the ASBOG exams. It is very difficult for specialist senior professionals such as myself to pass such exams. My expectation of the outcome of my taking the exams is definitely low. This is based on personal experience. A few years ago I unsuccessfully attempted the Idaho geologist licensure exams. I am unfamiliar with many of the technical terms in the example ASBOG exam questions that I have reviewed from geological fields in which I have never worked. To be reasonably assured of passing, I would need to take a number of weeks off from work to study, and possibly pay for tutoring. It is unfair that we would need to do this to continue practicing in our field of work.

I hope this submission gives you a good understanding of many of the problems and severe negative impacts that can be expected from introducing geologist licensure to Colorado. At this time, I have not addressed my many concerns about specific clauses in the proposed statute. I will be happy to do so at another time. Please feel free to contact me for clarification of any of the issues that I have addressed, or with any other questions.

Sincerely,

Trevor R. Ellis

Trevor R. Ellis, CMA, CPG, FAusIMM(CPGeo)
Minerals Appraiser, Geologist, Economist

Enclosures: Ellis Dec. 2000 paper
Letter to KY Board, May 2000

cc: W.J. Siok, Executive Director, AIPG
cc: F.S. Turek, President, ASBOG