WANTED - TPG ARTICLES

Instructions to Authors

The TPG accepts articles of modest length for publication. Submittals should be no more than approximately 1600 words, or six typed pages, double spaced. Longer articles may be divided into parts (e.g. part 1 and part II), but this is not encouraged. Articles may be technical or professional in nature. General topics are listed below. Articles containing news of importance to professional geologists will also be considered. Except for news articles, or articles containing dated materials, submittals should be sent to AIPG headquarters twelve weeks in advance of expected publication. Some technical topic issues are planned up to one year before printing, therefore early submittals will be preferred.

Manuscripts should have the following section:

- Title
- Author(s) with CPG number and address
- Text
- Tables if included
- Figures with captions if included
- Appendix(es) if included
- Acknowledgments
- References Cited

One original and two copies of each manuscript should be submitted. Whenever possible, text should also be submitted on diskette. Headquarters uses WordPerfect 7 for Windows '95, which is preferred, but Word, ASCII, RTF, or translatable files are acceptable. The program or format of the text should be clearly marked on the diskette. Articles can also be transmitted by e-mail.

Graphics should be clear, camera-ready, line drawings whenever possible. Photographs (color or black and white) are also encouraged. Whenever possible, drawings may be submitted on diskette in .pcx, .bmp, tiff, gif, or other standard formats. **TPG wants color slides and photographs.** Slides and photographs alone may be submitted for the cover. They should have a geologic theme and an informational caption.

General Topics:

**Technical**
- Mining (January)
- Petroleum Geology (March)
- Hydrogeology (July)
- Environmental Geology (September)
- Geophysical/Engineering (November)

**Professional (any issue)**
- Government and the Geologist
- Ethics and Standards of Practice
- Public Perception of Geology and Geologists
- Definition, Certification, and Licensing
- Practicing Geology Internationally

Other suggestions: Forensic Geology, History of Practice in a given field, Book Reviews, Geology and the Military and, Unusual Applications of Geology.

Authors are encouraged to communicate with Headquarters via mail, fax, or Internet. Send your article and/or photographs, or communicate questions to:

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Myrna M. Killey, Editor
January, 1999

January, 1999

Volume 36, Number 1

The Professional GEOLOGIST

PEER REVIEWED PAPER

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David M. Abbott, Jr., CPG-4570

Future Activities and Emphasis of the U.S.
Geological Survey Water Resources Division
Gail E. Mallard and Robert M. Hirsch

AIGP Comments on USGS-WRD
Strategic Plan

An Important Questionnaire Is Coming Your Way

AIPG Reviewers Sought for National Science
Foundation Research Grant Proposals
Tom Fails, CPG-3174

AIPG Web Site Member Login Instructions

FRONT COVER - Abandoned gold/base metal mining site from earlier this century
near the Red Mountain district of southwestern Colorado. Photograph by Mark
A. Koestel, CPG-08307.

BACK COVER - Photographs/Slides were provided courtesy of the Anchorage
Convention and Visitor's Bureau, Glee Anderson, Representative (ACVB),
and Evelyn's Focus Photography, Evelyn S. Erickson, Photographer (EFP, ESE).

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The Professional Geologist (USPS 590-810 and ISSN 0279-0521) published monthly except semi-
monthly in April by the American Institute of Professional Geologists, 7828 Vance Drive, Suite 103,
Arvada, Colorado 80003-2125. Periodicals Postage Paid at Arvada, Colorado and additional mailing
offices.

POSTMASTER: The Professional Geologist, AIPG, 7828 Vance Dr., Suite 103, Arvada, CO 80003.

Subscriptions for all Members and Adjuncts in good standing are included in annual membership dues.
Subscription prices are $20.00 a year for Members’ additional subscriptions and $30.00 a year for
non-members for 12 issues (for postage outside of the U.S. add $10.00 for Canada and $18.00 else
where). Single-copy price is $2.00 for Members and $3.00 for non-members. Claims for nonreceipt
or for damaged copies are honored for three months.

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Now That I’m Registered, Why Do I Need Certification?"

Missouri Section’s report to the Advisory Board meetings in Baton Rouge stated the problem very well: “AIPG needs to offer something to its membership that is clearly needed but cannot be obtained through state registration. We need ... to define what that service is and then market it to the geologists.”

Answers based on my personal experience follow, but they are the answers of a petroleum geologist in a non-registration state. The answers of registered CPGs in registration states may differ considerably. One purpose of this editorial is to encourage an exchange of views on this question in TPG during 1999.

Most CPG resource geologists have followed similar career paths. Typically we join a major company after graduation, move on to one or more independent companies and then become an independent (i.e. self-employed) geologist or form a small company. Most U.S. resource geologists are in this latter category. Lots of industry highs and lows, like now, have occurred during the past 40 years. It’s been very much a survival operation in which some have survived and even prospered while a larger number have departed industry, voluntarily or involuntarily. Those who have survived have reputations for:

• continuing technical competence, through updating
• innovative thinking and practices,
• a good track record,
• visibility through committee work and/or presenting talks, publishing papers, short courses, etc.,
• integrity and fair-dealing,
• persistence and resilience.

All are necessary for resource geologists to maintain their professional competitiveness. Meaningful involvement in geoscientist and government relations activities, in advocacy/outreach for geologists, and with personal networks of fellow geoscientists, clients, people in government, other professionals, service providers, and financiers is also necessary. Together, with luck, they seem to work well for many independent resource geologists. As our work is typically in a number of states and countries and rarely affects the public, state registration is unattractive. Certification by AIPG and/or DPA/AAPG is preferred by many.

How does all this help answer the question before us for, say, a hydrogeologist CPG registered in three states so that he/she can work there? Registration provides this basic necessity, but why is Certification needed as well? I answer that AIPG Certification provides the same visibility, status, and competitive edge to registered engineering, environmental, and hydrogeologists as it does to unregistered resource geologists.

State registration of geologists whose work directly affects the public is justified. Objective criteria—education, experience and examinations—are used to filter out unqualified “bottom feeders.” Ethical requirements appear to vary from state to state. Most states use these criteria to raise or lower the bar for registration, thus establishing a “lowest common denominator.” The public is therefore protected, but what of the registrants? All swim in a common “qualified” pool of engineering, environmental, or hydrogeologists but lack individual visibility. Some will do well, some less so, some will fail. Those employed by large firms will enjoy the benefits and deficiencies typical of geologist employees, but their visibility is their employers’, not their own. But most registered geologists work either for themselves or for small companies. How can they obtain visibility, remain competitive, and grow technically in the continuing struggle for a piece of a gradually shrinking pie?

Humans band together to accomplish cooperatively what they cannot do individually. Organizations like AIPG provide mechanisms for collective planning, action, and support for the economic, political, and professional welfare of their members. Numbers count, but organized numbers count for more! They provide access, credibility, and heft in the public and political arenas. A spokesperson representing a statewide organization of professionals will normally have greater influence in, say, a legislative committee hearing than will a lone individual representing himself. Similarly, when your rights as an individual geologist are threatened, who will speak up or act for you? The state? Not likely—they have registered you to protect the public.

These services and more are often supplied by well-run AIPG Sections, including the “running” of registration bills. Our political effectiveness in many states and at the Federal level is increasing; our influence exceeds that of some larger geoscience organizations.

Nevertheless, in some registration states AIPG is seen as offering little of value to registered geologists beyond registration’s “lowest common denominator” guarantee. This is not surprising, considering our continued reliance on qualifications set in 1964. Because of this, recent Executive Committees have placed increasing emphasis on strengthening Certification. Examinations for new CPGs, continuing education, and some form of certification maintenance requirement are all under consideration. “Raising the bar” for Certification begins a gradual effort to raise the status, credibility, and visibility of CPG to a higher level. Competitiveness, visibility, and continually enhanced competence characterize CPGs and clearly are necessary for survival of individual geologists, whether registered or not.

As noted at the beginning, additional answers to the question are sought, especially from registered geologists who perceive a continuing need for AIPG Certification. Contact me directly if you like, but letters and articles for publication in TPG will reach a far larger audience. Let us hear from you.
Development of Background Levels

Shivani Kesar, Environmental Engineer, and R. David Asti, CPG-9044

A background level is defined by the United States Environmental Protection Agency (USEPA) as “the concentration of a hazardous substance that provides a defensible reference point that can be used to evaluate whether or not a release from the site has occurred.” The background level should reflect the concentration of the hazardous substance in the medium of concern for the environmental setting on or near the site (USEPA 1995). Background sampling is conducted at CERCLA/RCRA sites to distinguish site-related contamination from naturally occurring or other non-site-related levels of chemicals. Background samples are collected at or near hazardous waste sites in uncontaminated areas. The samples are collected from each medium of concern that could not have received contamination from the site but does have the same basic characteristics as the medium of concern at the site.

Background sampling locations are typically identified based on knowing which direction is upgradient or upstream. The rationale for the development of background levels is to determine realistic background values that can be used in addition to Risk Based Concentrations (RBCs), to evaluate potential contamination at a site. These background values may also serve as potential cleanup levels for contaminated sites. Background levels of elements or chemical compounds may reflect ambient concentrations that are present in the environment. Anthropogenic contamination may also contribute to the background levels that prevail at a site (USEPA 1989).

A variety of published statistical methodologies are available to calculate background levels (e.g. Gilbert 1987). We performed a statistical evaluation of analytical data for a particular site to develop a single background concentration for each of the Target Analyte List (TAL) metal analytes found in the native soil/groundwater at the site. This discussion will be limited to the soil concentrations. These background concentrations were set equal to the upper one-sided 95 percent confidence limit of the mean concentration of each metal. The determination of background levels in this manner is approved by USEPA Region III and is discussed in the Risk Assessment Guidance (USEPA 1989).

The 95 percent Upper Confidence Limit (UCL) of the arithmetic mean was calculated for the TAL metals data from the samples collected to establish the background concentrations. If a small proportion of the observations are non-detects (ND), they were replaced with Method Detection Limit divided by two (MDL/2) (EPA 1989). If there was no sample detected or only one sample was detected above detection for a particular analyte, then the 95 percent UCL for that analyte was considered to be non-detect. The data for each analyte were tested for lognormality/normality by the Wilk-Shapiro Test (W-Test) (Gilbert 1987). Because the lognormal distribution appears to be a better default statistical model for most environmental data, logarithmic transformation is commonly performed on all data prior to checking distribution type (USEPA 1989).

Therefore, the data were first tested for lognormal distribution. If the data were lognormally distributed, the 95 percent UCL of the arithmetic mean was calculated by equation (1) (USEPA 1992). If the data were not lognormally distributed then the data was tested for a normal distribution. If the data were normally distributed, the 95 percent UCL of the arithmetic mean was calculated by equation (2) (USEPA 1992). If the data did not exhibit either lognormal or normal distributions then the data were evaluated based on whichever distribution most closely resembled the dataset (Gilbert 1987 USEPA 1992).

The 95 percent UCL of the arithmetic mean for the lognormally distributed data was calculated as follows:

\[
95\% \, UCL = e^{\left(\bar{x} + 0.6745s + H \frac{H}{n-1}\right)}
\]  

where:

- \(95\% \, UCL\) = 95 percent UCL of the arithmetic mean
- \(\bar{x}\) = mean of the transformed data
- \(s\) = standard deviation of the transformed data
- \(H\) = H-statistic (Gilbert 1987)
- \(n\) = number of samples

For normally distributed data sets, the 95 percent UCL was calculated using the following equation:

\[
95\% \, UCL = \bar{x} + t \left(\frac{s}{\sqrt{n}}\right)
\]

where:

- \(95\% \, UCL\) = 95 percent UCL of the arithmetic mean
- \(\bar{x}\) = mean of the untransformed data
- \(s\) = standard deviation of the untransformed data
- \(t\) = student-t test (Gilbert 1987)
- \(n\) = number of samples
Figure 1
Statistical Analysis Flow Chart

- More Than One Sample > DL, Non-Detect = DL2
- Data is Lognormally Distributed per W-Test
- Background Level = Maximum Concentration
- Background Level = Medium Concentration
- Background Level = Minimum Concentration

- Data is Not Lognormally Distributed per W-Test
- Data is Not Normally Distributed
- If 95% UCL > Maximum Concentration
- Background Level = Maximum Concentration

Table 1
Statistical Analysis of Background Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Conc &lt;sup&gt;3&lt;/sup&gt; mg/kg</th>
<th>MDL &lt;sup&gt;3&lt;/sup&gt;</th>
<th>Deleted Value &lt;sup&gt;3&lt;/sup&gt; mg/kg</th>
<th>Natural Log of Deleted Value &lt;sup&gt;4&lt;/sup&gt;</th>
<th>Arithmetic Mean Concentration</th>
<th>Arithmetic Mean Concentration of Log-Transformed Data</th>
<th>SD of Deleted Value</th>
<th>SD of Log-Transformed Data</th>
<th>%&lt;sup&gt;5&lt;/sup&gt;</th>
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If the calculated 95 percent UCL for a lognormally or normally distributed data was higher than the maximum detected value, the latter number was used to represent the background value.

A statistical analysis flow chart is presented in Figure 1 to outline the procedure for the development of background levels.

A background study performed by Fluor Daniel Environmental Services Inc. (FDESI), and approved by both the U.S. Army Corps of Engineers, and the Virginia Department of Environmental Quality (VaDEQ), was used to establish background levels for a military base in central Virginia. FDESI developed background levels of metals in surface soil, subsurface soil, and groundwater, and of pesticides in surface soil at this military base, using the above mentioned methodology. These background levels will be utilized, in addition to Risk Based Concentrations, to evaluate potential contamination and clean-up rationales for project sites at the base. Table 1 presents an example of the methodology and statistical evaluation of background data for selected metals.

These data represent the surface soil background concentrations for four TAL metals (beryllium, cobalt, mercury and nickel). The analytical data for beryllium followed a lognormal distribution; therefore, equation (1) was used to calculate the background level for beryllium. The analytical data for cobalt followed a lognormal distribution; however, equation (1) yielded an Upper Confidence Limit greater than the maximum detected value. As a result, the maximum detected concentration of cobalt was used to represent the background level for cobalt. The background level for mercury was considered to be less than the MDL, as there was only one detected value for mercury. The analytical data for nickel followed a normal distribution; equation (2) was used to calculate the background level for nickel. Background levels for the other the analytes not discussed in this paper were calculated using similar statistical methodology.

Conclusions

This study demonstrates a simple statistical methodology for calculation of site-specific metals background concentrations. With the increasing regulatory emphasis on risk-based models for remediation and site closure, development of site-specific background concentrations has become more common. Use of these background concentrations as site clean-up standards can result in cost-effective use of remediation dollars as opposed to spending excessive funds trying to attain unrealistic general clean-up standards for remediation.

Where feasible, multiple media background sampling for both inorganic and organic constituents should be conducted. Samples should be sufficient in number so that basic statistical analysis can be conducted for the medium in question. The front-end dollars spent on establishing a good background database will more than pay for itself in back-end remediation dollars saved.

References:


Shivani Kesar, Environmental Engineer, and R. David Asti, CPG-9044.

Reviewers: Robert A. Stewart, CPG-8332, and Scott A. Tiller, CPG-10016.
What is a Competent or Qualified Person and Who Cares?

David M. Abbott, Jr., CPG-4570

Consulting Geologist

In the mining industry, the question “Who is a competent or qualified person?” wrestles with the issue of what qualifications are required of someone who prepares mineral resource and ore reserve estimates for reporting by public entities. The question “Who cares?” applies specifically to those who file mineral resource and ore reserve estimates in jurisdictions requiring that a competent or qualified person sign the report. More generally, the specifics of the debate within the mining industry should be considered by all professional geologists because similar issues occur within the petroleum, geological engineering, and environmental businesses, and specific qualifications and experience involving several professions are increasingly included in regulations. This debate is similar to but different from calls for licensing in that it focuses on specific types of regulated reports which may be prepared by several professions. Thus the mining examples in this paper reflect a specific example of a general topic.

The term, Competent Person, as used in this paper, first appeared in the Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC Code) several years ago. The JORC Code, developed and revised by the Joint Ore Reserves Committee (hence the acronym) of the Australasian Institute of Mining and Metallurgy (AusIMM), the Australian Institute of Geoscientists, and the Minerals Council of Australia, is mandatory for those filing resource and reserve estimates with the Australian Stock Exchange. The JORC Code defines competent person as “a Member or Fellow of the Australasian Institute of Mining and Metallurgy and/or the Australian Institute of Geoscientists with a minimum of five years experience which is relevant to the style of mineralization and type of deposit under consideration and to the activity that person is undertaking. . .”

In June 1998, the Mining Standards Task Force, established by the Toronto Stock Exchange and the Ontario Securities Commission in response to the Bre-X and other mining scandals of 1997, issued its Interim Report, Setting New Standards (TSE/OSC MSTF Interim Report). Included in the TSE/OSC MSTF Interim Report were recommendations that a Qualified Person be responsible for designing and assessing mineral exploration programs and estimating mineral resources and mineral reserves, and be required to certify “all reports and disclosure relating to the mineral exploration or development program, mining operation, or estimates of resources and reserves.” A Qualified Person “should be defined as an individual, . . . who is an engineer or geoscientist with at least 5 years’ experience in mineral exploration, mine development or operation or project assessment relevant to the subject matter of the project or report, and who . . . is a member in good standing of a professional association.” The TSE/OSC MSTF Interim Report goes on to describe the characteristics of Recognized Professional Associations whose members (or specific grades of members) warrant recognition by securities regulators as a Qualified Person. The characteristics include recognition that members be subject to disciplinary proceedings for professional misconduct, that financial welfare is included with the meaning of public welfare for disciplinary proceedings, that the professional association’s disciplinary proceedings be timely and proactive, and that the results of disciplinary proceedings be made public.

The reason the TSE/OSC MSTF Interim Report recommendations contain the detailed descriptions of Recognized Professional Association stem from two factors. First, there is currently no mechanism for the licensing of geoscientists in Ontario (efforts to amend the Ontario Professional Engineers Act to include geoscientists have been opposed by the engineers). The second—and I would like to think more important factor—is recognition that mining is an international business and that the professionals who will author the reports will be not necessarily be Ontarians, Canadians, or North Americans and therefore could not reasonably be required to be licensed by the Province of Ontario. Hence the development of the Recognized Professional Association concept. I should note that the concepts in the JORC Code pervade the TSE/OSC MSTF Interim Report and thus implicit, although not explicit, recognition that Members and Fellows of AusIMM ought to qualify as Qualified Persons in Canada.

The foregoing discussion dealt with two formal definitions of the Competent or Qualified Person and the concept of a recog-

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1. Dictionary definitions of “competent” and “qualified” are similar, indeed “competent” may be one of the words defining “qualified” and vice versa. Possession of appropriate training and skills is also commonly included in the definitions. However, as Stan Dempsey, President of Royal Gold, who is a licensed attorney, points out, while he is qualified by virtue of law license to defend someone accused of murder, he is not competent to do so; he’s in the mining business, not criminal defense. I believe Dempsey has captured an important distinction between “competent” and “qualified” and, therefore, prefer “competent” as the appropriate modifier.

2. Should the TSE/OSC MSTF Interim Report’s recommendations regarding Recognized Professional Associations be adopted, AIPG will apply for recognition.
organized professional association. Regulatory adoption of the concept exists in Australia and is being considered in Canada, two of the more important countries in the world for mineral financing, especially of the more numerous junior mining companies. Clearly these terms are of increasing importance to mining industry professionals. In the US, the concepts are being debated by those, including me, who are involved in developing mineral resource and mineral reserve definitions and classifications and those who are required by regulation, company policy, or client request to apply the definitions and classification to specific deposits.

I believe that AIPG meets the qualifications to be a Recognized Professional Association, as defined in the TSE/OSC MSTF Interim Report. AIPG’s Certified and Registered members should therefore meet the membership in a professional association requirement recommended for the Toronto Stock Exchange and the Ontario Securities Commission. But, as explicitly stated in both the JORC Code and Canadian recommendations, being a Certified or Registered member of AIPG is not enough to be deemed a Competent Person to estimate mineral resources and reserves. One must also possess a sufficient amount of relevant training and experience. Just what constitutes relevant training and experience is the difficult question lurking just under the wording of the JORC Code, the TSE/OSC MSTF Interim Report’s recommendations, and other debates concerning “What is a competent person?”

The difficulty in defining “competent person” stems from the fact that geologists, mining engineering, metallurgists, environmental scientists, mineral economists, lawyers, and others (or at least aspects of these professional areas) are all involved in determining whether ore reserves exist. Therefore, enumeration of the appropriate professional qualifications is difficult. No one in fact is fully qualified in all relevant areas. Those who are generally recognized as competent persons have particular expertise in one of the areas, have knowledge of the other areas, and are unafraid to ask for assistance. Usually, the reports that form the basis for stating that the XYZ Mine contains ore reserves are based on the work of a variety of professionals, even though there is a principal compiler or project manager who is the competent person for the particular deposit.

Because AusIMM Members and Fellows can be geologists, mining engineers, metallurgical engineers, and other mining industry professionals, the JORC Code is able to cover the range of mining industry professions by requiring AusIMM membership. Because of the current limitations of the law, namely failure to include within one organization all relevant professions, Ontario’s regulators face a problem similar to that of U.S. regulators in defining who qualifies as the competent person. On the other hand, the North American situation focuses attention on the need to recognize that more than one profession can be legitimately involved in a field of practice, ore reserve estimation in this case, and on the need for comity between jurisdictions both intra-nationally and internationally. The TSE/OSC MSTF Interim Report’s recommendation for recognition of professional associations meeting specified criteria is a concept that could assist in solving both regulatory and professional flexibility needs. However, successful development of the concept requires that professional associations be willing to undertake disciplinary actions for professional misconduct. While both AIPG and AusIMM have demonstrated their willingness to do so, not many professional organizations are.

This paper has focused on the concept of the competent person as it is being developed within the mining industry. However, the concepts can be easily generalized to other practice fields. Indeed, calls for the regulation of environmental professionals as a group contain some of the same elements, particularly the recognition that a variety of professional backgrounds are legitimately involved. It can only be hoped that in developing such new regulatory schemes, the need for openness and comity can be recognized instead of developing a pattern of “closed shop” guilds, a tendency which has plagued much of the professional licensing movement to date.

In summary, specifically defining who is a competent person becomes difficult when determining who is qualified to sign off on reports covering the work of several professions. The answer is something like defining beauty or pornography: you know it when you see it. Nevertheless, societal demands for verifying the competence of those reporting on complex subjects, mineral reserve reports being just an example, are increasing. Responding to these societal demands in a way that meets both society’s needs and the need for professional flexibility is why we, as geologists, should care.

References


David M. Abbott, Jr., CPG-04570, Denver, Colorado.

3. I was recently a member of a non-AIPG committee charged with comparing the disciplinary procedures of various geological professional societies. Most societies’ disciplinary or grievance procedures are fairly short, particularly compared with AIPG’s several pages. I believe the difference reflects the fact that AIPG has actively enforced its Ethics Code and has learned the need for procedural care and specificity.
Future Activities and Emphasis of the U.S. Geological Survey Water Resources Division

By Gail E. Mallard and Robert M. Hirsch, U.S. Geological Survey

The U.S. Geological Survey (USGS) Water Resources Division (WRD) is in the final stages of articulating its vision for the next ten years. The purpose of this article is to present the major points of WRD’s future plans, especially those that may be of interest to members of AIPG.

MISSION

WRD’s mission and activities define the organization and distinguish it from other scientific or governmental organizations. The mission of WRD is to provide reliable, impartial, timely information that is needed to understand the Nation’s water resources. WRD actively promotes the use of this information by decision makers to—

• Minimize the loss of life and property as a result of water-related natural hazards, such as floods, droughts, and land movement.
• Effectively manage ground-water and surface-water resources for domestic, agricultural, commercial, industrial, recreational, and ecological uses.
• Protect and enhance water resources for human health, aquatic health, and environmental quality.
• Contribute to wise physical and economic development of the Nation’s resources for the benefit of present and future generations.

This new statement of our mission is consistent with the USGS Organic Act and other legislation including our annual appropriations.

Programs

WRD achieves its mission by using funding from three distinctly different sources: (1) USGS Federal program funds, which provide 100 percent support for certain efforts; (2) Federal-State Cooperative program funds, which are a combination of Federally appropriated funds (up to 50 percent) and funds from cooperating agencies at the State and local level; and (3) reimbursable funds, which are contributed by various partners without any Federal match. Each source of funding brings its own benefits. Appropriated Funds provide the foundation that allows WRD to address important national issues. They provide comprehensive national data sets, and allow us to conduct regional and national synthesis of data and information. Federal funds also provide the primary source of support for research and development, which is necessary for the long-term productivity of WRD and the hydrologic science community. The Federal-State Cooperative program and the reimbursable program ensure the relevance of WRD work and help WRD to identify emerging issues. These programs provide significant support for long-term data-collection networks and interpretive projects that can be integrated to give regional and national understanding of the Nation’s water resources. Currently, we are conducting the first-ever comprehensive review of our Federal-State Cooperative program. As a valued stakeholder organization for WRD, AIPG is participating in this review, which will help guide the future of this important program.

Although cooperative and reimbursable programs will remain vital to the overall mission of the WRD, we must be mindful of avoiding work more appropriately done by the private sector. WRD must be responsive to the requests and interests of potential partners, but at the same time set limits on the type of work undertaken on their behalf. The USGS rejects many requests for reimbursable work because it is more appropriately conducted by the private sector. In many projects the USGS and the private sector work together on different aspects of an issue. The USGS provides a research, data collection, or regional interpretation role while private sector firms work on design, operations, or regulatory aspects of the project.

We must approach our potential customers with the viewpoint that our role is to form true partnerships that meet both Federal and non-Federal needs. Projects undertaken for customers must be conducted with impartiality and be consistent with WRD’s mission.

Through its cooperative and reimbursable programs, each USGS district office should continue to develop our understanding of the water resources of their State(s) and contribute to WRD’s leadership in providing new approaches, technology, and research for solving water-resources problems. Therefore, cooperative and reimbursable projects should provide an enhancement of knowledge or an enhancement of hydrologic methodology that is likely to be useful beyond the immediate needs of the customer. Examples of such broader goals are:

• Advancing knowledge of regional hydrologic systems.
• Advancing field or analytical methodology.
• Advancing understanding of hydrologic processes.
• Providing data or results useful to multiple parties in potentially contentious interjurisdictional conflicts over water resources.
• Furnishing hydrologic data required for interstate and international compacts, Federal law, court decrees, and Congressionally mandated studies.
• Providing water-resources information that will be used by multiple parties for planning and operational purposes.
• Furnishing hydrologic data or information that contributes to protection of life and property.
• Contributing data to national data bases that will be used to advance the understanding of regional and temporal variations in hydrologic conditions.

Priority Water-Resource Issues

Nine water-resource issues have been identified for increased emphasis during the next 10 years. Other issues and technical areas still have much value, and WRD will continue to collect data and conduct projects related to them. As projects end and new projects begin, however, more human and financial resources will be directed to the nine high-priority issues. Because of the importance of these issues to water-resource managers and the public, support for increased effort is expected from the Administration, Congress, cooperators, and partners.

WRD has a scientific infrastructure and much of the expertise needed to address these issues. We will build upon and enhance these strengths by forming partnerships with other USGS divisions, Water Resource Research Institutes, the academic community, and scientists from State, local, and other Federal Agencies. We also will work closely with land and water managers in the public and private sectors to identify their information needs better. Through these partnerships, we will form interdisciplinary teams to address the priority water-resource issues.

Issue 1. Effects of urbanization and suburbanization on water resources

Urbanization and suburbanization change the natural flow and recharge of water; introduce sediment, nutrients, and contaminants to surface and ground water; and increase demand for freshwater. To address these changes, WRD will conduct hydrologic studies to provide information to policymakers and resource managers as a basis for decisionmaking on issues such as use of buffer zones along streams and around lakes, urban pesticide and fertilizer use, and urban best management practices. WRD will also develop tools necessary to manage watersheds effectively as the complex systems that they truly are.

Issue 2. Effects of land use and population increases on water resources in the coastal zone

By the year 2010, scientists estimate that 75 percent of the United States population will live within about 50 miles of the Atlantic and Pacific coast or one of the Great Lakes. Pressures on the coastal zone include an aging urban infrastructure, as well as demands for additional supplies of drinking water and a safe means to dispose of human and industrial waste that result from new growth. Population growth in the coastal zone also will add to stress on coastal ecosystems that provide recreation and critical habitat for waterfowl, shellfish, and finfish.

WRD will make an important contribution to coastal-zone water issues by providing estimates of fluxes of major chemical species (especially nutrients) at key inflow points to the Nation's estuaries, coastal zones, and the Great Lakes and by conducting studies of saltwater intrusion into aquifers, movement of saltwater upstream in tidal rivers, and the effects of water withdrawals on coastal wetlands.

Issue 3. Drinking water availability and quality

Maintaining a safe supply of drinking water in the future will require considerable expenditure of money for protecting drinking water sources, treating drinking water, and monitoring its quality. WRD will make a valuable contribution to the issue of drinking water availability and quality by conducting more studies of geologic controls on ground-water resources; providing better descriptions of the quality of water available in aquifers under various management and growth scenarios; providing empirically based ground-water and surface-water quality vulnerability assessments; and working with the U.S. Environmental Protection Agency (EPA), the Centers for Disease Control (CDC), and others to establish effective detection and monitoring methodologies for infectious, waterborne pathogens, such as Giardia and Cryptosporidium.

Issue 4. Suitability of aquatic habitat for biota

Aquatic habitat in this country has been severely altered by human activities, including construction, agriculture, and deforestation that increase sediment loads in rivers; construction of dams that impede migration of fish and other aquatic species; construction of dams and diversions that change the flow regime and modify habitat; drainage of wetlands areas; and increases in concentrations of nutrients and other chemicals in water. WRD will contribute to the scientific understanding needed by land and water managers to address these problems.

Issue 5. Waste isolation and remediation of contaminated environments

There are several hundred thousand sites in the United States where the environment has been contaminated by past industrial, mining, military, agricultural, and commercial activity. The cost of cleaning up these sites has been estimated to be as high as almost a trillion dollars. Costs of preventing future contamination are also significant for Federal, State, and local government and the private sector as they attempt to manage industrial and domestic waste and find a suitable repository for radioactive waste. WRD can make important contributions to the scientific basis for risk evaluation, waste isolation, and remediation through its combination of knowledge of hydrology, chemistry, and biology and its ability to conduct complex interdisciplinary studies of environmental contaminants.

Issue 6. Hydrologic hazards

Every year hydrologic hazards (floods, droughts, subsidence, landslides, and tsunamis) result in the deaths of about a hundred people, in the loss of hundreds of millions of dollars in damages, and in the disruption of thousands of lives. Better understanding of hydrologic hazards, better warning systems, and better risk information can minimize the consequence of these hazards. Over the next 10 years, WRD will work to provide data and scientific results that will allow land and water managers, land-use planners, emergency management officials, including the Federal Emergency Management Agency, and the general public to understand the nature of risk before a hazardous event occurs, to monitor development of hazardous events as they occur, and to take action to minimize the effects of future hazardous events.

Issue 7. Effects of climate on water-resource management

Recent extreme climatic variations have demonstrated that water-resource managers must develop their management systems in a context that assumes a wide range of possible climatic conditions, including the potential for significant and long-lasting departures from historically normal conditions. WRD will provide some of the ingredients for a robust water-management strategy, which include long-term climate and proxy-climate records for use in climate modeling and better hydrologic simulation models to help assess the future of regional water resources conditions.
Issue 8. Surface-water and ground-water interactions as related to water-resource management

Management of water resources has focused traditionally on either surface water or ground water as if they were separate entities. Yet, nearly all surface-water features, including rivers, lakes, wetlands, and estuaries, interact with ground water. Development of either water source affects the quantity and quality of the other. WRD will provide leadership on this important issue by increasing the number of studies of (1) effects of ground-water withdrawals on streamflows, surface-water levels, and aquatic ecosystems; (2) ground-water recharge from surface-water bodies; (3) effects of climatic variations on the discharge from shallow ground-water systems; and (4) effects of ground-water/surface-water interactions on efforts to restore wetlands or construct new wetlands. Based on these studies, WRD will build and disseminate models for simulating interactions between ground water and surface water to quantify the effects of human activity.

Issue 9. Hydrologic-system management, including optimization of ground-water and surface-water use.

Recent experience with resolution of difficult water-management and allocation problems has shown that a capability to simulate the characteristics of the hydrologic system, at watershed scale, is critical. What is needed are water-management models that are accepted by the various competing interests in water conflict. These models must be capable of showing the consequences of various water-management decisions over a wide range of hydrologic and climatic conditions.

In recent years, simulation models have been combined with techniques of optimization to address various water-resources problems. Combined simulation and optimization models account for the complex physical processes of the hydrologic system and identify the best management strategy for a particular objective(s) and set of constraints. The approach offers a rigorous way to provide information of management relevance. As applied in USGS studies, management agencies and others provide information on the objectives and management constraints, whereas USGS scientists provide expertise in simulation and optimization techniques and help to provide realistic solutions to water management problems.

Evolution of Ongoing Scientific Programs

Overall, WRD’s ongoing scientific and technical program can be described as a mix of (1) long-term data collection, (2) interpretation and assessment, and (3) research and development. During the next 10 years, these program components will evolve to be more effective, and we will work to achieve a better balance among them by increasing our level of effort in basic hydrologic data collection. We will also work to achieve a better balance among water resources discipline areas by increasing the ground-water component of our program mix.

During the last several years there has been a decline in the long-term data-collection program. The number of continuous-record streamflow stations has been reduced; the number of stations included in the National Stream Quality Accounting Network (NASQAN) program and Hydrologic Benchmark Network program has decreased; and the ground-water-level network has shrunk in size. This decline in basic hydrologic data collection is inconsistent with the increasing need for more comprehensive monitoring to support the intensive management and protection of water resources that will be needed as the Nation’s population grows.

Many stakeholder groups, such as the American Association of State Geologists and the Interstate Council on Water Policy, have expressed concern about the status of our streamgaging program. In addition, our House Appropriations Committee has recently requested a report on issues of network size and design. In response to these stakeholder interests, and to our own strategic analysis, we are currently working on a comprehensive design for a National Streamflow Information Program in collaboration with our Advisory Committee on Water Information.

Our strategic analysis also indicates a significant need to rebuild USGS capabilities and programs aimed at assessing ground-water resources in terms of resource sustainability and impacts of ground-water development on surface water resources and habitat. Our House Appropriations Committee has expressed its concern over these issues and has asked the USGS to report on its plans for the future of ground-water resources studies. The existing USGS ground-water resources program, as well as our plans for the future, are currently being reviewed by a committee of the National Research Council.

We believe that the USGS has made great strides in recent years in improving the availability of data and methods for use by public and private sector water resources professionals. For example, real-time streamflow information is now available on the Internet for about 4,000 locations. The entire record of 160 million daily streamflow values is also available on the Internet. Some of these records cover more than 100 years. Similarly, a broad suite of USGS simulation models, such as MODFLOW, are freely available.

Our future plans call for expanding this easy access to our data to include ground-water data and surface-water and ground-water quality data. New models under development aim at improving the ability to jointly simulate ground-water and surface-water systems and to simulate geochemical and microbiological processes. We are also improving user interfaces, including the integration of geographic data into our simulation models.

Conclusions

The ideas presented in this article are more fully described in a planning document, Strategic Directions for the Water Resources Division, 1998-2008. The document resulted from extensive discussion among WRD senior managers and scientists. It is currently being reviewed by several hundred current and potential customers, partners, and users of the water information we produce. The reactions, concerns, and agreement of these reviewers, including AIPG, will guide any necessary modifications to the document. Once finalized, the document will be implemented throughout the division as we make decisions about new programs and projects, investments in new tools and technologies, and issues related to operational practices.

We look forward to the continued engagement of AIPG in helping us shape our programs to the maximum benefit of water-resources science and engineering professionals and the Nation that all of us serve. Comments on this article or other questions can be directed to the WRD Chief Hydrologist via e-mail at thirsch@usgs.gov. More information on access to hydrologic data, models, research, or programs can be found on the Internet at http://water.usgs.gov/.
AIPG Comments on USGS-WRD Strategic Plan

AIPG has been very active in communicating with and providing input to the USGS-WRD. In October of this year, AIPG was asked to comment on a draft of the Strategic Directions for the Water Resources Division, 1998 - 2008, to which Drs. Mallard and Hirsch refer in the previous article. AIPG's official comment, compiled by Stephen Testa based on comments received from the membership, was sent to Dr. Hirsch in December, 1998 (copies of the comment letter may be obtained from AIPG Headquarters). Issues addressed include the USGS-WRD's mission statement, wetlands, project selection criteria to minimize/avoid competition with the private sector, Cooperative Research and Development Agreement's (CRADA), global climate change and population growth, and potential or perceived competition with various state programs.

In recent years, AIPG has become more active in providing an advocacy role for the profession. Advocacy of the profession is one of the five purposes of the Institute. AIPG officers at the National level and members of the AIPG National Affairs Committee have participated in the annual Washington, DC Fly-In, in the National Research Council’s study of the “Future Roles, Challenges, and Opportunities for the United States Geological Survey,” and in the Department of Interior's external Task Force for the Review of the Federal-State Cooperative Water Program, all of which have a direct involvement in shaping the future of WRD. AIPG’s interaction with the WRD is only one of many advocacy efforts actively pursued by the National Affairs Committee. AIPG strongly encourage all members to become active in the advocacy of the profession. Please contact Jim Shotwell, Chair of the National Affairs Committee, to learn more about the issues presented here and to become involved in AIPG activities.

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Alamo features the General Motors cars like the Pontiac Grand Am.
Monthly update prepared by Kasey Shewey White and David Applegate

• Election Produces Few Changes for 1999
• Gloomy White House Prediction for FY2000 Budget
• US Signs Kyoto Treaty at Buenos Aires Conference
• Groat Sworn in as 13th USGS Director
• CUR to Showcase Undergraduate Research on Capitol Hill
• 1999 AGI Congressional Fellowship, Internships Available
• Tentative Schedule of Upcoming GAP Activities
• New Material on Web Site

Election Produces Few Changes for 1999

Although the Republicans held on to their majorities in both the House and Senate, the loss of five House seats in the midterm elections was enough to produce a change at the top. Within days, Speaker Newt Gingrich (R-GA) resigned and was replaced by current Appropriations Committee Chair Bob Livingston (R-LA). Gingrich was an advocate for science and technology issues, asking Rep. Vern Ehlers (R-MI) to undertake a national science policy study and at one point calling for the budget surplus to be used for science, defense, and transportation. Representing the oil-rich state of Louisiana, Livingston has long been an advocate of the petroleum sector, which may bode well for efforts to provide tax relief for the industry as oil prices continue to hit record lows.

Rep. C.W. Bill Young (R-FL) will replace Livingston as Appropriations Committee chair. The VA/HUD/Independent Agencies Appropriations subcommittee that funds the National Science Foundation, NASA, and EPA is getting a new chair as well. Rep. James Walsh (R-NY), whose upstate New York district includes Syracuse University, replaces Rep. Jerry Lewis (R-CA), who moves up to chair the subcommittee that handles defense spending. The new ranking member for the VA/HUD subcommittee will be Rep. Carrie Meek (D-FL), a former biology professor.

In the Senate, Republicans maintained their 55-45 seat majority despite the loss of incumbents Lauch Faircloth (R-NC) and Alphonse D’Amato (R-NY). Among the notable changes in committee leadership, Senator Jeff Bingaman (D-NM) replaces retiring Senator Dale Bumpers (D-AR) as ranking Democrat on the Senate Energy and Natural Resources Committee.

Gloomy White House Prediction for FY2000 Budget

The scientific community will have another fight on its hands in order to secure funding increases in the President’s Fiscal Year 2000 budget. Speaking to the President’s Committee of Advisors on Science and Technology, Office of Management and Budget Director Jacob Lew said that the administration’s commitment to science and technology “is a very deep one” but also cautioned that FY 2000 is a “very tight budget year.” The administration is committed to staying within the budget caps and plans to use any surplus for social security. Lew indicated that the Administration favors research that is long term, collaborative, and has potentially high payoffs.

US Signs Kyoto Treaty at Buenos Aires Conference

On November 14th in Buenos Aires, more than 160 nations agreed to a follow-up agreement to the Kyoto Protocol on climate change, negotiated in December 1997. The Buenos Aires agreement sets a deadline of late 2000 for establishing rules to enforce the Kyoto treaty and setting guidelines for a market-based trading program. In addition, the negotiations showed that developing countries are becoming involved in the effort to reduce greenhouse gases, a condition necessary to gain the support of the US Senate for ratification of the Kyoto Protocol. More than 12 developing nations—including host Argentina and Kazakhstan—agreed to voluntarily reduce greenhouse gas emissions.

During the negotiations, the US signed the Kyoto Protocol, but administration officials indicated that they would not submit it to the Senate. Vice President Gore stated: “Our signing of the Protocol underscores our determination to achieve a truly global solution to this global challenge. We hope to achieve progress in refining the market-based tools agreed to in Kyoto, and in securing the meaningful participation of key developing countries. Signing the Protocol, while an important step forward, imposes no obligations on the United States. The Protocol becomes binding only with the advice and consent of the U.S. Senate. As we have said before, we will not submit the Protocol for ratification without the meaningful participation of key developing countries in efforts to address climate change.”

Groat Sworn in as 13th USGS Director

Claiming that 13 is his lucky number, Charles G. “Chip” Groat was sworn in on Friday the 13th as the 13th Director of the U.S. Geological Survey. The ceremony was held at the USGS National Headquarters in Reston, Virginia. Secretary of the Interior Bruce Babbitt administered the oath of office. In his remarks, Groat stated: “USGS responsiveness to society’s needs for a better understanding of the earth, its life, processes, environments, and resources depends on first class science. A major challenge for the USGS is maintaining its strong tradition for scientific excellence while expanding the capacity to make it relevant to decision makers at all levels and effectively communicating the needed information. I will work hard at supporting and advancing both the science and its applications.” Groat was most recently Associate Vice President for Research and Sponsored Projects at the University of Texas at El Paso. He is a former executive director of AGI and was Louisiana State Geologist for twelve years.

CUR to Showcase Undergraduate Research for Congress

One of AGI’s member societies, the Council on Undergraduate Research (CUR), is seeking undergraduate students to present posters on their research to Congress. On Wednesday, April 14, 1999, CUR will host an undergraduate poster session to help members of Congress understand the importance of undergraduate research programs by giving them a chance to talk
directly with the students whom these programs impact. More information on the event is available on the CUR website: <http://www.cur.org/hill_poster.html>

### 1999 AGI Congressional Fellowship, Internships Available

GAP is now accepting applications for its 1999 summer and fall internships. Although the AGI/AIPG summer 1998 interns are gone now, articles they wrote recently appeared in the October issue of The Professional Geologist. These articles and other legislative and policy updates prepared by the interns are available on the AGI website. AGI is also accepting applications for its 1999-2000 congressional science fellowship. Information on both the internships and fellowship is available on the AGI website at <http://www.agiweb.org/gaphome.html>, and flyers have been mailed to over 200 university geoscience departments. We encourage you to pass along the information to individuals that you feel may be interested. The application deadline for the fellowship is February 1, 1999, and the internship deadline is March 1, 1999. Please contact David or Kasey if you have any questions.

### Tentative Schedule of Upcoming GAP Activities

A draft report from the last AGI Government Affairs Advisory Committee forum held in Toronto is available on the web at <http://www.agiweb.org/gapac/report1098.html>. The committee’s next meeting is tentatively scheduled for Friday, April 23, 1999 at AGI headquarters in Alexandria VA.
- Dec. 6-10, AGU Fall Meeting, San Francisco, CA
- Dec. 15, PPP 2000 Natural Hazards Forum, Washington, DC
- Dec. 16, AAAS Science Policy Workshop, Washington, DC

### New Material on Web Site

The following updates and reports were added to the Government Affairs portion of AGI’s website <www.agiweb.org> since the last monthly update:
- Special Update: AGI Offers 1999-2000 Congressional Science Fellowship (Posted: 11-30-98)
- Methane Hydrate Research and Development Act Update (11-24-98)
- FY 1999 Science Appropriations and Budget Process Update (11-23-98)
- Global Climate Change Update (11-20-98)
- Reports on Potential Economic Impacts of Binding Emissions Reduction Standards (11-20-98)
- Update on Superfund Legislation (11-11-98)
- Domestic Oil & Gas Incentives Legislation Update (11-6-98)
- Education Policy Update (11-6-98)
- Oil and Gas Royalty-In-Kind Update and Hearing Summary (11-6-98)
- Sea Grant Reauthorization Update (11-6-98)
- Strategic Petroleum Reserve Update (11-6-98)
- Year of the Ocean Update (11-2-98)
- Geotimes Political Scene: A Science Policy for the Next 50 Years? (11/98)
- Contradictions Reign Over Alaska's National Petroleum Reserve (reprinted from The Professional Geologist 10/98)
- Mitigation Banking and the Clean Water Act (reprinted from The Professional Geologist 10/98)
- Royalty Valuation: A Royal Pain for All (reprinted from The Professional Geologist 10/98)
- Commission Recommends Shift in Western Water Policy (reprinted from The Professional Geologist 10/98)

This monthly update goes out to members of the AGI Government Affairs Program (GAP) Advisory Committee as well as the leadership of AGI’s member societies and other interested geoscientists as part of a continuing effort to improve communications between GAP and the geoscience community that it serves. Prior updates can be found on the AGI website under “Government Affairs” <http://www.agiweb.org>. For additional information on specific policy issues, please visit the web site or contact us directly at <govt@agiweb.org> or (703) 379-2480.

### An Important Questionnaire is Coming Your Way

**PLEASE RESPOND**

You may have already received, or will soon receive, a questionnaire being circulated for the Task Force for Continuing Professional Development (TFCPD) by your Section. Please take a few minutes to read and consider the Introduction and the seven questions, then respond. Section officers have been asked to compile the answers to the first six questions and to return the compilation and marked questionnaires to Headquarters by February 1, 1999.

The TFCPD, formed early in 1998, has been asked to study and report on “the feasibility and desirability of introducing requirements for 1) Continuing Education for renewal of CPG, 2) for Examinations for granting of Certification, and 3) for requiring periodic recertification.” Three TFCPD subcommittees have made some preliminary recommendations to the Task Force in these three areas. Some of the recommendations are so far-reaching that they merit consideration and informed input from CPGs before additional work is undertaken. The questionnaire has been prepared by Task Force members and was distributed by National to the Sections during December.

Please consider the questions seriously. Recent National Executive Committees believe that CPG qualifications must be strengthened in the long term if AIPG is to survive, prosper, and better serve the membership. In view of the competition provided by state registration and the current standards used by most certifying organizations, serious consideration has to be given to how Certification can be strengthened in ways that the membership perceive to be in their own best interest.
The Professional Geologist • JANUARY 1999

PROFESSIONAL ETHICS & PRACTICES - Column 38

Compiled by David M. Abbott, Jr., CPG-4570, Ethics Committee Chairman, 2266 Forest Street, Denver, CO 80207-3831, 303-394-0321, fax 303-394-0543, DMAgeol@aol.com

AGI Ethics Guidelines for Ethical Professional Conduct

Following the 1997 Ethics in Geosciences Conference, an ad hoc American Geological Institute committee was formed to develop ethics guidelines for consideration by AGI member societies. The intent of the guidelines is not to require specific action or language by any society but simply to provide guidance to the extent desired. I served as AIPG’s representative to this committee. The guidelines were based on existing geoscience and other professional society ethics codes, and on basic values developed by the participants in the 1997 Conference. The guidelines drafted by the committee were presented to AGI at the GSA meeting in Toronto in November and comments were requested from AGI member societies. The current draft guidelines, which include the comments received from the member societies, are:

The American Geological Institute (AGI) expects the profession to adhere to the highest ethical standards in all professional activities. The following aspirational guidelines are presented as representative of the core values that form the foundation of the ethics for the geoscience profession. They are presented as the highest common denominator of values for the profession.

Geoscientists should strive to advance the integrity, honor, and dignity of their profession by undertaking the following:

• Use their knowledge and skill to enhance understanding of Earth and to enhance the well-being of humans and the environment;
• Exhibit honesty in professional actions at all times;
• Enhance the prestige of the geoscience profession; and
• Support the profession and technical societies of the profession

More specifically, the position of AGI is that geoscientists must acknowledge responsibility to:

The Public and Society: Geoscientists should hold paramount the safety, health, and welfare of the public in applications of geoscience knowledge to society’s needs. Efforts should be made to educate the public on all matters related to the geosciences (e.g., hazards and resources). Public comments on geoscience matters should be made with care and accuracy, without unsubstantiated, exaggerated, or premature statements; they should be made clearly and concisely.

The Environment: Geoscientists should strive to protect our natural environment. They should understand and anticipate the environmental consequences of their work and should disclose the consequences of recommended actions. They should acknowledge that resource extraction and use are necessary to the existence of our society and that such should be undertaken in an environmentally and economically responsible manner.

The Geosciences: Geoscientists should seek to advance their science, understand the limitations of their knowledge, and respect the truth. They should ensure that their scientific contributions, as well as those of their collaborators, are thorough, accurate, and unbiased in design, implementation, and presentation.

The Profession: Geoscientists should continue professional development to remain current in their field. They should maintain honesty and integrity in all conduct and publications, fully acknowledge the contributions of others, and accept responsibility for their own errors. They should provide scientific service only in areas of competency. Economic consequences and implications of geologic work should be acknowledged. Conflicts of interest, both real and perceived, should be acknowledged and avoided, when appropriate. Scientific misconduct, including falsification or fabrication of data and plagiarism, is unacceptable in the geoscience profession.

The Employer: Geoscientists should promote and protect the legitimate interests of their employers, perform work honestly and competently, avoid conflicts of interest, safeguard proprietary information, and provide adequate notice before leaving an employer.

Employees: Geoscientists should treat their employees with respect and trust with concern for their well-being, provide an acceptably safe and congenial working environment and fair compensation. They should properly acknowledge employees’ professional contributions and should encourage professional career development.

Clients: Geoscientists should serve clients faithfully and only in technical areas of competency. They should advise honestly, regardless of the impact of the advice, respect confidentiality, and charge fairly.

Students: Geoscientists should treat their guardianship of students as a trust conferred by the profession for the promotion of students’ learning and professional development. Each student should be treated with respect and without exploitation.

Colleagues and Associates: Geoscientists should treat their colleagues and associates with respect, encourage them, learn with them, share and exchange ideas, and acknowledge their contributions. They should strive to ensure that colleagues and associates respect the ethical principles of the profession and they should nurture and mentor young professionals.

The AIPG Code of Ethics already covers most of the areas in the AGI Guidelines. The points specifically lacking are a statement regarding the environment, and specific statements regarding students and employees. A draft statement on the environment is the topic of the next section. If you believe specific statements regarding students and employees should be included in the AIPG Code of Ethics, let me know along with a proposed statement. If you believe such statements are warranted, I would suggest adding them as Standards under Canon 4.

Code of Ethics: Proposed Environmental Canon

A significant number of geoscientists work in the environmental and related fields like hydrogeology. Resolution of issues like the global warming debate clearly will depend in part on good geoscience information. However, the environment is not specifically addressed in our Code of Ethics. Since the 1997 Ethics in Geosciences Conference, I have been discussing this issue with various people and groups, including the AGI ad hoc committee and the AIPG Ethics Committee. The result of those
discussions is the following proposed Canon 6 (the number is the next in sequence and is not indicative of importance).

**Canon 6: Obligation to the Environment**

Members should anticipate and understand the environmental consequences of their work and should disclose the consequences of recommended actions. They should acknowledge that resource extraction and use, which may affect the environment, are necessary for the welfare of our society.

No standards or rules have been proposed for this proposed Canon.

The suggested language avoids loaded words and phrases like “protection of the environment.” Does protection mean the same thing to you as everyone else, including those who do not share your views? In our professional capacities, we can describe anticipated environmental consequences of various actions. Making judgments regarding which is the “best” action may call for consideration of factors outside the scope of the geosciences. As Standard 3.3 reminds us, we must act within the confines of our professional knowledge and experience. Further, if we have done a particular study, making such judgments based on anything besides our geologic study may render our views subject to attack due to perceived bias.

One comment I received on the proposed Canon asked why resource extraction is specifically mentioned in an environmental Canon. The answer reflects the fact that one of the most immediate contributions of geoscientists to the public welfare is the exploration for and delineation and extraction of the natural resources used by society. A significant percentage of geoscientists have been and continue to be employed in such activities. Natural resource exploration and exploitation activities have an impact on the immediate environment in which such activities take place. In some cases the impact is negligible, in others the impact is very large. Whether such activities should occur at a particular location is a value judgment that well may include non-scientific values.

There is a tension and a need for balance between the needs for environmental protection, however one defines protection, and society’s need for resources. The proposed Canon recognizes the existence of this tension and the fact that application of the geosciences is critical in both delineating the resources and in delineating many of the short- and long-term impacts of exploitation.

Adoption of a new Canon represents a major change in the Code of Ethics. Although the Executive Committee has the authority to amend the Code of Ethics, the membership should carefully reflect and comment on any suggested changes, particularly the addition of a Canon, prior to formal action. I will not recommend adoption of this Canon to the Executive Committee until you, the membership, have had your say and any debate which develops is resolved. Your comments on this proposal are very much desired (as are suggestions regarding the treatment of students and employees).

**Are Ethics Being or Doing?**

Fred L. Fox, CPG-1273, wrote, “More than thirty [PE&P] columns have here discussed ethical behavior and I’m still frustrated by the inability to zero in on what we geologists consider ethics. As a member of [the Ethics] Committee, a former contributor to [TPG] (the Consultants Column), and a committed student of ethics since at least the late ‘60s, I’d like to put in my two cents’ worth.

“For years I’ve sought to define ethics in a way that not only makes sense, but applies in all cases. Nobody’s pulled this off yet, so why should I try? Well, why not?”

“Initially, let me provoke your ire by stating my belief that our Code of Ethics is both ponderous and backwards, and that the word should ought to be replaced by the word must. My past suggestions about this having been ignored, you may consider the issue dead. But my point here is valid. If we don’t get ethics right in the first place, the rest of it will not follow. And it hasn’t.”

“Why? Because we’ve gone at the problem from the position of behavior, trying to apply ethics to behavior. It won’t work. What works better is defining what is meant by ethical.

“Being ethical should mean the same thing no matter where it is applied. This takes it out of the realm of values, because values (and even morals) depend on the society defining them. It takes it out of the realm of law for the same reason. As they say, ‘you could look it up.’ And if being ethical under one set of conditions is different from being ethical under another set, then it’s no wonder why we can’t agree on what’s meant by it, or a definition of ethics itself.

“The problem is easier approached from the other side—what’s meant by being unethical. Like pornography, it’s tough to define but we know it when we see it, and we see it from a global point of view as well—what’s unethical here also is unethical there. Now, what does that mean?

“Being unethical provides a clue—it’s a state of being rather than a state of doing (behavior). Being unethical doesn’t require doing, and therefore being ethical doesn’t, either. Being ethical is a principle, not a product. If this isn’t easy to appreciate, it at least gives new meaning to the word ethics (which is what we’re trying to define, right?). It’s principle. Ethics (and morality and moral) are not values or morals. They’re not ideas or matters of opinion, but principle itself.

“An unethical person will be seen as such, no matter which society looks at it. So, the same must hold true for the obverse—the ethical person. The only way to achieve this condition is by defining ethics from a standpoint where all parties concur, which reduces the definition to absolutes or givens—what applies in all circumstances for all or any part of mankind. And there are absolutes—or at least things(?) that are absolute enough—like the laws of thermodynamics and gravity—that we can count on totally. These are truths, and the absolute with respect to ethics turns out to be exactly that—truth. Try it. It works every time.

“Another absolute is perfection (just because you can’t achieve it doesn’t mean it’s not there). And so we come up against the inevitable wall. Truth and perfection being what they are (absolute), we can’t expect to achieve it/them, certainly not every time. That probably means we can’t be ethical all the time which, in our human circumstance, prompts us to reject the definition I’ve given here. If we can’t be ethical, then there must be something wrong with this idea of it. Not so. An ideal is a good thing to have, even if we can’t get to it. (We can’t explain gravity, but we know it’s there.) Besides, there’s an out. If there are times when you must be unethical (according to the definition given here), like lying to the knife-wielding thug asking if you know the whereabouts of the bleeding victim you’ve just hidden to protect her, so be it. Face it: If you lie or mislead, you’re being 1. Another suggestion is that shall replace should. In the Canons and Standards, should is used while shall is used in the Rules, with the exception of the recently adopted Rule 4.2.1.
unethical. But there’s a moral way out: if you must be unethical, be honest about it—illustrating my earlier claim that we’ve got our Code of Ethics backwards. Honest to whom? First to ourselves, and so on down the line to last, the public. The fact that we’re part of the whole (humanity) saves us when we must choose to be unethical or not and, if we keep it in this perspective, we will make the moral (right) choice every time.

“The right thing to do” in any case is to honestly operate in the full light of truth. Laws, rules, appearances and opinion (even polls) have nothing to do with it. Being ethical means being honest, first with yourself and finally to humanity. It doesn’t rely on circumstance. You have to work with principles that work every time, and truth works every time. If you’re truthful you’ll be ethical, and if you’re honest with yourself and mankind you’ll be moral.”

Fox has been thinking about professional ethics for a long time. He and I have corresponded over the years. I don’t agree with everything Fox writes (nor he with everything I write), but I always find his views worth paying attention to if for no other reason than they force you to think more carefully about your own views. Are ethics separate from moral codes? Are ethics a state of being rather than doing? Are ethics a set of universal, absolute principles like scientific laws? Do you believe it is unethical to lie to the knife-wielding thug to protect someone? Should the Code of Ethics be changed to replace should with shall or must? Are there significant differences between these words to you? Comments are welcomed.

**Censorship in Scientific Journals**

A recent editorial in *Nature* asked whether scientific journals should refuse to publish articles reporting on research involving the use of techniques or materials deemed morally objectionable. Studies using human embryonic stem cells were cited as an example of such research. While I believe that this issue warrants debate, human embryonic stem cell research is not an immediate issue for geoscientists. Then I read a Letter to the Editor in the November *AusIMM Bulletin* by Lee W. John. John objects to mining uranium because “Uranium has two principle uses—warheads and nuclear energy both of which have caused widespread human anxiety (and in some cases harm) for several decades.” John notes that one result of the global warming debate is an increase in the number of proposed nuclear power plants, and thus an increased demand for nuclear fuels. John then suggests that the AusIMM membership be asked to vote on whether uranium mining in general should be supported. John “suspects” that a “slight majority” support his views. Are ethics separate from moral codes? Are ethics a state of being rather than doing? Are ethics a set of universal, absolute principles like scientific laws? Do you believe it is unethical to lie to the knife-wielding thug to protect someone? Should the Code of Ethics be changed to replace should with shall or must? Are there significant differences between these words to you? Comments are welcomed.

2. I sent John a draft of this section of this column. He replied, “I am strongly against censorship of any literature, particularly of a scientific nature. There is a big difference between studying nuclear physics and its application.”

2. The Oregon Department of Geology and Mineral Industries (DOGAMI) has released a report that describes the uses of the earthquake hazard maps published by the Department.

The report is entitled *Using Earthquake Hazard Maps, A Guide for Local Governments in the Portland Metropolitan Region*, and has been released as DOGAMI Open-File Report O-98-04. It was prepared by Spangle Associates, Urban Planning and Research of Portola, California, for Metro, the regional government for the Portland metropolitan area, and originally published by Metro. The release by DOGAMI is intended to make the report available to a wider audience.

This guide describes how local governments use earthquake hazard maps prepared by DOGAMI to reduce damage and losses in earthquakes. It is addressed to local government staff and elected and appointed officials who regulate the use and development of land and construction of buildings and prepare for and manage disaster response and mitigation. The guide focuses on local government actions but also recognizes that all levels of government, businesses, community organizations, households, and individuals play roles in reducing a community’s vulnerability to earthquakes. The guide was originally developed for the Portland metropolitan area but applies in other densely populated regions as well.

The 45-page report includes discussions of the state and regional context for the local use of earthquake hazard maps; particular aspects of local use such as zoning, subdivision, siting of public facilities, and seismic retrofitting; and listings of pertinent information sources.

The new report is now available for the price of $10 over the counter, by mail, FAX, or phone from the Nature of the Northwest Information Center, Suite 177, State Office Building, 800 NE Oregon Street #5, Portland, Oregon 97232-2162, phone (503) 872-2750, Fax (503) 731-4066; and the DOGAMI field offices: 1831 First Street, Baker City OR 97814, phone (541) 523-3133, Fax (541)-523-5992; and 5375 Monument Drive, Grants Pass, OR 97526, phone (541) 476-2496, Fax (541) 474-3158. Orders may be charged to Visa or Mastercard. Orders under $50 require prepayment.

**New Guide Explains Ways to Use Earthquake Hazard Maps**

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The United States spends millions of dollars on geologic research every year, some in the form of National Science Foundation research grants. Are these monies spent wisely? Do some of the research results impact your geologic specialty? In particular, would more involvement of private sector, working geologists in evaluating research proposals be of value? Would you, as a professional geoscience specialist, like to become involved? If so, read on!

Four new standing National Affairs or National-State Affairs Subcommittees were established by the Executive Committee during 1998. All four address specific issues affecting many CPGs. Two will deal with unfair competition issues, and a third with National Energy issues. The fourth, the National Affairs Subcommittee on Peer Review, has been charged to: "1) provide peer reviewers for National Science Foundation Grant requests to assure quality and compatibility with approved Executive Committee Policies and Positions; 2) as needed, to recommend to the Executive Committee, via its parent committee, appropriate action(s), Policy Statements, Position Statements, etc., and 3) in the context of approved Executive Committee Policies and Positions to work with its parent committee to influence public policy, legislation and regulations."

The concept for a Peer Review Subcommittee has been developed in connection with and in response to discussions with Dr. Ian MacGregor, Director, Division of Earth Sciences, NSF at meetings during AIPG’s 1997 and 1998 Washington Fly-Ins. The possibility of the Institute supplying peer reviewers for geologic research proposals to NSF was mentioned by MacGregor in 1997. As this was of interest to many National Executive Committee members, additional information was obtained during our May 1998 visit with Dr. MacGregor. The gist of our discussion follows.

NSF typically receives about 1600 proposals annually for financial support of geoscience research in all fields of practice. The academic community is the source of most proposals, and of most proposal reviewers as well. Some industrial geologists also serve as reviewers. NSF is interested in increasing the participation of working geologists, people who are “outside the bureaucracies,” and invites the cooperation of AIPG and its members in this regard.

There are two levels in the NSF review process:

1) mail reviewers
2) review panels

Initially, AIPG members might be most suited to become mail reviewers. The review panels are composed largely of academics with a leavening of industry people; some AIPG mail reviewers might be able to advance to the review panel level with sufficient effective experience. Mail reviewers are specialists; they review proposed research projects in their individual specialty practice fields. Typically, there are 6 to 20 mail reviews for each proposal, which express the individual opinions of the reviewers. As the name suggests, the proposals to be reviewed are mailed to the reviewers. A written evaluation of each proposal is to be mailed back to NSF by each mail reviewer within a specified period. The mail reviews are then collected and used as guides by the review panels. There are about 10 review panels for the various geologic specialties, who meet at NSF headquarters in Arlington for (usually) three-day review sessions. Review panel recommendations are passed on to NSF for the final selection process.

The same two criteria are used by both the mail reviewers and review panels in their work:

- What is the intellectual merit of the proposed activity (i.e. excellence)?
- What are the broader impacts and intellectual relevance (i.e. value)?

Proposals for NSF research grants are received during January of each year: accordingly an annual review process is necessary.

NSF has provided the following discussion of the current Review Criteria.

**REVIEW CRITERIA**

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 (NSB 97-72). The criteria are designed to be useful and relevant across NSF’s many different programs, however, NSF will employ special criteria as required to highlight the specific objectives of certain programs and activities.

The merit review criteria are listed below. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgements.

What is the intellectual merit of the proposed activity?
How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources? What are the broader impacts of the proposed activity? How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

As noted, NSF is interested in having AIPG participation in both types of reviews. However, the external review process is not publicized, so the Institute will need to submit a request for participation. This will be a function of the Subcommittee for Peer Review, to seek and identify to NSF qualified geological specialists willing to serve initially as mail reviewers. After a group of would-be mail reviewers has been identified, and their qualifications established, the Subcommittee will submit a request for participation in the mail review process by AIPG to NSF.

As of early December, the Subcommittee on Peer Review was still in the process of formation. Dr. Robert Weimer, Emeritus and former Head of the Department of Geology and Geological Engineering, Colorado School of Mines and a Charter Member of AIPG, has agreed to initially Chair the Subcommittee. As the Subcommittee is to review the qualifications of volunteers from the Institute membership for mail reviewers and to make recommendations thereon to NSF, the Subcommittee needs at least two additional members to work with Dr. Weimer. If you are interested in joining the Subcommittee on Peer Review, please contact Dr. Weimer or myself directly.

Members interested in serving as mail reviewers for NSF research grant proposals are asked to prepare a brief application including a resume describing their educational and experience background. They should in particular describe the geologic specialty/specialties in which they believe themselves to be sufficiently qualified by knowledge and experience to fairly and effectively evaluate research grant proposals in their specialty. Your application and resume, accompanied by whatever brief statement you may wish to make, should be forwarded by mail to Headquarters, marked “Subcommittee on Peer Review.” Headquarters will collect and forward these materials periodically to the Subcommittee. As NSF’s annual review process starts every January, applications, resumes, etc., should be received at Headquarters no later than 15 September 1999.

As a professional geologist, please consider this proposal seriously.

WASHINGTON, D.C. — Future prospectors on the Moon may be assisted by resource maps developed from research by scientists in Arizona and Hawaii. The resources they will be seeking are not gold or diamonds, but helium-3 [3He], an isotope that is rare on Earth, but more common on the Moon. Helium-3 is expected to be the cleanest fuel of choice for potential 21st century fusion reactors, because its reaction is efficient and produces low residual radioactivity. Drs. Jeffrey R. Johnson of the U.S. Geological Survey in Flagstaff, Arizona; Timothy S. Swindle of the University of Arizona’s Lunar and Planetary Laboratory in Tucson; and Paul G. Lucey of the University of Hawaii’s Institute of Geophysics and Planetology in Honolulu have developed a helium-3 map of the Moon based on a combination of factors they have analyzed. Their research will be published in a forthcoming issue of Geophysical Research Letters, a publication of the American Geophysical Union, as “Estimated Solar Wind-Implanted Helium-3 Distribution On The Moon.”

The factors taken into account by the researchers in mapping the likely abundance of helium-3 in a given area are the exposure age of the Moon’s surface matter, or regolith; the relative amount of charged particles, including helium-3, arriving from the Sun (the solar wind); and the titanium content of the lunar soil. The mineral ilmenite [FeTiO3], composed of iron, titanium, and oxygen, retains helium much better than other major lunar materials. The older soils should be better sources of helium-3, they report, because they have been exposed to the solar wind longer and contain greater amounts of fine-grained aggregates that absorb helium-3. Also, solar wind-implanted particles are more abundant on the far side, because the Earth shields the Moon’s near side from the solar wind for a portion of each solar orbit.

The scientists estimate that the greatest amounts of helium-3 will be found on the far side maria, or “seas,” of the Moon, due to the higher solar wind, and in nearside areas with high concentrations of titanium dioxide [TiO2]. Their hypothesis is based on analysis of rock samples brought back by Apollo astronauts and mineralogic maps produced by the Clementine spacecraft. They expect to refine their maps with new elemental composition maps produced by the Lunar Prospector spacecraft.

Prospecting for Helium-3 on the Moon

The GRL paper upon which this release is based will be faxed to journalists on request to Harvey Leifert (see contact information above). It has not yet been scheduled for a specific issue of Geophysical Research Letters, but there is no embargo. For further information on the science in this paper, journalists may contact Dr. Jeffrey R. Johnson at USGS Flagstaff: Phone (520) 556-7157; fax (520) 556-7014; e-mail <jjohnson@flagmail.wr.usgs.gov>.
Hugh Hay-Roe, CPG-03291

The Comma – A Handy Tool: Part 1

Two Guidelines can take much (though never all) of the trickiness out of using commas: (1) use common sense and logic in punctuating to HELP THE READER; (2) when in doubt, read a sentence aloud, inserting commas to mark brief pauses.

The humble comma is as useful to a writer as the nail-set is to a carpenter. My favorite old story about the importance of the comma concerns a Russian nobleman who got crossways with the czar by messing about with a lady of the court (or perhaps it was with the czarina herself). The czar issued a telegraphic instruction concerning the nobleman: PARDON IMPOSSIBLE, TO BE SENT TO SIBERIA. The lady in question intercepted the message and, by moving the comma, saved her lover from exile: PARDON, IMPOSSIBLE TO BE SENT TO SIBERIA.

Some on-the-job writers, unsure about where commas are appropriate, try not to use any; others take the opposite approach and stick commas in wherever they can, just to cover all bases. These extremes often go beyond the permissible limits of open punctuation (punctuate only where it is required) and close punctuation (punctuate wherever the rules allow).

Effective use of commas isn’t that difficult if we remember that the purpose of punctuation is to help the reader. This reduces our dependence on rules, some of which are arbitrary and out of date. (If you feel safer with rules, Lord knows there are plenty! That old standby, the Harbrace College Handbook, has 23 pages on the comma, and the Gregg Reference Manual has 24. Needless to say, a lot of the fine print covers exceptions to the rules.)

Two tests can help resolve problems; right now we’ll review one of them. Since the comma marks a pause (in speech) – the briefest indicated by any punctuation mark – you can often guide yourself by reading aloud and listening for that slight lowering of the voice that marks a short pause. Few men would object to being called a pretty important guy, but I don’t know any who would like to be called a pretty, important guy. The comma can make a world of difference. Another example:

• The women, claim the men, are always to blame.

• The women claim the men are always to blame. If you were the writer of the foregoing, you would know which of the two ideas you were trying to express, and you could HELP THE READER by punctuating to make your meaning clear.

Our final example involves the old argument about whether a comma is needed before and in a sequence of three or more items:

• The sample was vuggy, fractured and oil-stained.

A comma after fractured is strictly optional, and in short sequence like this it is certainly not essential for clarity.

But what about this:

Reservoir possibilities include Cretaceous sandstones that thinned to the north and wedged out to the west, Eocene conglomerates of variable extent, thickness, and permeability, and porosity developed in Devonian and Mississippian carbonates.

Clearly, that sentence needs a comma before the final and. Anyone who would arbitrarily rule out that comma after permeability doesn’t have much sympathy for the reader.

Semicolons offer an even stronger way to separate a series of items that would require semicolons after west and permeability. Writers who are seriously committed to helping the reader would, if the series is long enough, also consider numbering the three items—or tabulating them in a list introduced by bullets.

We’ll take up more comma problems in the following section. Meanwhile, when in doubt read a sentence aloud and listen for natural pauses. A brief pause merits a comma. That’s the latest, dope. I mean, that’s the latest dope.

The Comma - A Handy Tool: Part 2

To avoid a “comma splice” between two clauses, check each clause to see whether it can stand alone and make sense. If both can, a comma is too short a pause; you will need a semicolon or a period.

Part 1 offered one useful test for the placing of commas: since the purpose of punctuation is to help the reader, you can often, though not always, decide where to place commas by reading a sentence aloud. That preceding sentence contains a good example – the nonessential phrase “though not always” has to be set off in speech by pauses, so it needs a pair of commas (or parentheses, or dashes).

The other useful test will help you avoid the most frequent comma boo-boo: the so-called “comma splice” or “comma fault.” Writers make this error when they use a comma to separate independent clauses that are not joined by a coordinating conjunction, this is an example. (Coordinating conjunctions, by the way, are and, but, or, and nor.)

Here is another example: The formation was barren, they had trouble dating it. A comma is simply insufficient to separate two independent ideas; we need a semicolon (as in this sentence), a period, or a conjunction.

To apply the test, just read the clause on either side of the comma. If each clause can stand alone and make sense—and if there is no coordinating conjunction—then a comma is too brief a pause to separate the clauses properly.

To fill out the examples, here are three sentences in which a comma IS sufficient separation between clauses:

The formation was barren, and they had trouble dating it. (Contains a coordinating conjunction).

As the formation was barren, they had trouble dating it. (First clause cannot stand alone.)

The formation was barren, which meant they had trouble dating it. (Second clause cannot stand alone.)

Now, for those who are prone to put commas where they don’t belong, here are three good rules:

• Don’t use a comma to separate a preposition from its objects. Example: She made thin sections of, the rhyolite, the basalt, and the diabase. (No comma after “of.”)

• Don’t use a comma to separate a subject from its verb. Example: The rhyolite, basalt, and diabase, were then described. (No comma after “diabase.”) Clearly, there are exceptions to this rule. Example: Cal Karias, the limestone expert, will give a paper. (“the limestone expert” is nonessential information properly set off by commas.)
• Don't use a comma to separate a verb from its object (complement). Example: *The analyses show, that recovery can be improved 200 percent.* (Why some writers want to pause after “show” is a great mystery.) Again, there are exceptions to this rule. Example: *The expectation is, false readings have ruined the results.* (Here the comma replaces “that” and prevents the reader from misreading: “The expectation is false...”)

Unfortunately, there are always borderline cases like the czar’s telegram discussed in last month’s column, where some would say that a semicolon is needed. That bothers the people who have a hard time believing that punctuation marks—even commas—can be optional in certain situations. They want black-or-white certainties, but English is a democratic language, full of gray areas. When in doubt, look it up.

New Technical Library Catalog from ADSC

ADSC: The International Association of Foundation Drilling has just published its 1998-1999 Technical Library Catalog. The new catalog lists over 200 titles covering the entire spectrum of the design and construction of drilled shaft foundations and geo-support/anchored earth retention systems. It is organized to be an easy reference for almost all soil and rock environments. The ADSC’s Technical Library Service is the most comprehensive resource for information about these foundation and geo-support systems available worldwide.

The publications listed include research reports, proceedings papers, journal articles, and materials developed specifically for the ADSC. The information covers design, load testing, non-destructive evaluation techniques, standards and specifications, recommended contracting methods, an entire section on safety, as well as management and business practices. A variety of professionally produced visual aids for safety training and construction procedures are highlighted.

To order your COMPLIMENTARY copy of the ADSC’s 1998-1999 Technical Library Catalog contact the ADSC at P.O. Box 280379, Dallas, Texas 75228, or telephone (214) 343-2091, FAX (214) 343-2384, e-mail: adsc@ease.net, website: adsciafd.com.


The American Institute of Professional Geologists (AIPG) announces publication of *Geological Ethics and Professional Practices, 1987-1997,* a 202-page reprint of articles, discussions, and other material relating to ethics and general items of professional geological practice from AIPG’s monthly magazine, The Professional Geologist (TPG). The book was edited by David M. Abbott, Jr., compiler of the “Professional Ethics and Practices” (PE&P) column in TPG. Discussion topics from the column form a significant percentage of the book’s content. The book provides a thought-provoking introduction to geological ethics unavailable in any other single source.

Geological Ethics and Professional Practices, 1987-1997 is divided into five parts. Part I introduces the concept and scope of professional ethics codes and their close relationship to professional practices. AIPG’s Code of Ethics and Disciplinary Procedures follow as basic reference material for the rest of the book. Part II contains general contributions on professional ethics as a whole. Part III focuses on registration and licensing issues, including testing. It examines questions such as the effectiveness of registration in protecting the public. Part IV examines the utility and limitations of professional standards and the free exercise of professional judgment. Part V is an admitted melange of topics, although all address important issues. Related discussion topics from the PE&P column are included in relevant places throughout the book.

Rather than providing definitive answers to issues, *Geological Ethics and Professional Practices, 1987-1997* provides a variety of views. It demonstrates that many ethical questions are not black and white but rather require careful reflection and analysis. The whole range of geological practice in terms of both area of specialization and employer is covered. The target audience includes the whole range of the profession from undergraduate students through practicing geologists and professors to those who have reached emeritus status. It can serve as both a text and the starting point for further exploration of both the topics presented and other situations and examples from the reader’s own experience.

*Geological Ethics and Professional Practices, 1987-1997* is available from AIPG at a cost of $18 for AIPG members, students, and public libraries; and $25 for others. The price includes shipping and handling. Orders can be placed by calling 303-431-0831.

References


Certified Professional Geologists, Texas Section Newsletter, May and July 1989
AIPG Web Site Member Login
Instructions

Here are instructions for using the new AIPG web site, www.aipg.org. To enter the Members portion of the site, you must request your login name and password from Headquarters (303-431-0831 or aipg@aipg.org). If you are unable to connect to the site, please let us know immediately. Please remember that this is a new site with some sections still under construction. Comments and suggestions are welcome.

(Note: Your password is linked to your member record in the database. You will not be able to change it.)

The new home page is a more attractive, easy to use source of information for the public. It also offers new services to AIPG members. The site was designed by Advanced Solutions International and is linked to the AIPG database. Until mid-1999, the database will not be updated automatically and will require a periodic upload from Headquarters. An address change that you send to Headquarters may not show up on the site for several weeks.

• The “Welcome” section of the site is available to anyone. It features general information on AIPG, the application package, lists of state registration offices, publications, etc.

• To enter the members-only portion of the site, scroll down to “AIPG- Login”. Enter your name (all caps) and password as shown above. A new sidebar will appear with “Member,” “AIPG,” and “Membership” sections.

• The “Member” section has descriptions of our insignia items and publications, with a link to headquarters to place an order. There is also a list of the other member benefits such as insurance companies, rental car discount codes, etc.

• The “AIPG” section will give you up-to-date information on AIPG business. [Note: you do not need to login again here]

• “Check Out” will have information on future meetings.

• “URLS” provides links to sections, related societies, and state registration boards.

• “E-mail lists” lets you sign up on lists such as one for information on the 1999 Annual Meeting in Anchorage.

• “Comments” lets you send messages to Headquarters and to the Ethics Committee Chairman.

• “Pages” has folders on the status of registration bills and other topics of interest to the membership.

• “AIPG Forums” are for online discussion by the Executive Committee (Private Forum) and by the general membership (Public Forum).

• The “Membership” section is the online AIPG directory. The easiest way to look for a particular member is to use “Speed Search.” When searching by last name, you can enter the first few letters of the last name; this field is not case sensitive. You will also be able to search by company name at a later date. There will be names, city/states and phone numbers for the members listed. For additional information, double click on the member name. On this page, you can send an e-mail directly to the member by clicking on the red underlined e-mail address.

DO NOT USE THE SEARCH PORTION.
IT WILL BE REMOVED IN A FUTURE UPDATE OF THE SITE.

• The “Directory” section is organized like the printed directory, listing names alphabetically. However, the listings are organized by Section, with members who live outside the U.S. or in states that do not have sections being listed first. The Comp Section includes retired members and students.

Under Demographics, member specialty fields and employer names are listed. The primary specialty is UF_5, the secondary specialty is UF_6 and the tertiary specialty is UF_7. The employer name is by UF_10 and List1 shows the states/provinces where the member is registered/certified. In a future update of the site, we will be able to use the proper names for the fields.

[Note: As in the printed directory, there are symbols by some of the last names. * is for Registered Member, # is for Member, % is for Student Adjunct and ^ is for an Associate.]
As part of the Ohio Geological Survey's continuing effort to provide data to the public in the most useful format at the lowest cost, the Division has recently placed many digital files on our Web site, where they can be downloaded at no cost. The files are available via the Survey's File Transfer Protocol (FTP) site, which is easily accessible from the Internet. Connect directly to the FTP site from a web browser at <ftp://ftp.dnr.state.oh.us/geological_survey> or link to the FTP site from the Survey's home page at <http://www.dnr.state.oh.us/odnr/geo_survey/).

New digital files are periodically posted to this site. These digital files also may be obtained on CD-ROM from the Survey at $25.00 per disk (plus tax and handling). Questions concerning the data files should be addressed to Joe Wells at 614-265-1030; questions concerning graphics files should be directed to Jim McDonald at 614-265-6601.

Available Digital Data Files

Be sure to read the README or txt.file associated with each product for complete information concerning the files.

BASEMAP—Digital graphics files for each county in Autocad (.DWG) format. Files contain recently digitized land-subdivision boundaries from the Division of Geological Survey, as well as roads, streams, and other features digitized by the Ohio Department of Transportation (ODOT).

BEDROCK—ARC/INFO coverage of new bedrock-geology and bedrock-topography maps. Coverage is available for the areas of the following 30 x 60 minute (1:100,000) U.S. Geological Survey quadrangles: Lancaster, Lorain, Mansfield, Newark, and Wellston.

CORPSCON—National Geodetic Survey coordinate conversion program (converts State Plan x, y coordinates to latitude/longitude).

DDF 1-4—Division of Geological Survey Digital Data Files (DDF).

DDF1—749 wells in NW Ohio—includes tops and basic header data.

DDF2—Complete header information for 2,843 wells in the eastern two-thirds of the state that reach the Knox or deeper units (868 wells have formation tops).

DDF3—Miscellaneous support files/lookup files that assist in creating database systems.

Files include all common names and codes used in Division databases, including counties, townships, and quadrangles; formations; oil and gas fields; and oil and gas-well status codes.

DDF4—Selected oil- and gas-well production records for 11,955 wells drilled between 1972 and 1986.


GAS ATLAS—Summary information on nearly 5,000 gas fields in the Appalachian Basin.

GEOPHYSICAL LOGS—Log ASCII Standard (LAS) files of geophysical-log suites from 26 wells in Ohio, Indiana, Kentucky, and West Virginia. More will be added soon.

MAGNETIC DATA—Data from the U.S. Geological Survey used to create magnetic contour maps of Ohio. The data set is suitable for use in computer-contouring programs.

WELL_DB—County-by-county data files containing all oil- and gas-well locations digitized from Division of Geological Survey and Division of Oil and Gas township well-spot maps. This database is currently being revised to create consistent well identifiers which will comply with standards of the American Petroleum Institute (API).

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AIPG MEMBERSHIP CARDS

AIPG Members that paid their 1999 Annual Membership Dues by December 28, 1998 should have received their Membership Card in the mail. All others Members that pay by February 15, 1999 will receive their Membership Card by the end of February.

In accordance with Article 8, Section 8.2.1, of the Bylaws, Annual Membership dues are due and payable January 1, 1999. Those Members whose dues are not paid by February 15, 1999, will be suspended and will not be listed in the 1998 Membership Directory.
AIPG Publications

Issues and Answers Series

AIPG has prepared this booklet to educate potential homeowners about geologic hazards and geologic processes in the hope that an increased awareness of such hazards will help them avoid the misfortune of having their dream house become a financial nightmare. Geologic hazards are natural processes that threaten man and property. When individuals and communities build or develop, ignoring the geologic characteristics of the area, resulting losses can be measured in both lives and dollars. The general public may prevent many of these losses by seeking, and taking advantage of, available geologic knowledge prior to purchasing a home or property.

Paperback; 8.5” x 11”, 30pp.; Member price- $6.00; Non-member price- $9.00.

Petroleum (1998) NEW!
This book addresses the issues, and points the way to possible answers to questions such as: Is there enough oil to maintain our current lifestyle? Will there be oil available in the decades ahead? Will its price be affordable for us to both drive and keep warm in all parts of the country? Who should be blamed for the problem of supply and price? Why do we not just produce more oil in the U.S. and ignore the rest of the world? Is our national security in jeopardy because of the declining domestic production and increasing imports? What is the long-range environmental impact of any position we take? Should we save our oil for the future, or use it all now? In order to explore answers to these questions, this publication puts into perspective the nature and importance of petroleum, the geographical distribution of its reserves, the history of the industry, and an overview of petroleum exploration, production, and transportation.

Paperback; 8.5” x 11”, 36pp.; Member price- $6.00; Non-member price- $9.00.

Monograph Series

Government Affairs Manual (August 1996)
Geologists are not always involved in public policy decision-making that affects their profession. This may include legislators, lawyers, and real estate-developers dealing with the answering of geologic questions, formulating policies related to geology, and regulating development of resources and land use. A misinformed decision can mean serious harm to the public. AIPG recognizes that the state-based Sections can use some assistance and suggestions for their long-range strategic planning to guide their government affairs activities in their respective states or regions. This publication has been created to provide some guidelines on state government structure, lobbying, actions groups and networking, formulating positions on issues, and all the many communication methods that may be necessary to have a positive experience in becoming involved in governmental policy decisions.

Paperback; 8.5” x 5.5”, 27pp.; Member price- $4.00; Non-member price- $6.00.

The Professional Geologist as Expert Witness (April 1994)
More than ever before, geologists are asked to testify in litigation or in hearings involving public safety and convenience, or public funding. This guide is designed to provide the professional geologist with general guidelines needed for preparing and presenting testimony in a competent, professional manner. In addition, this guide is designed to help the testifying geologist cope with some common courtroom situations as well as provides suggestions for the presentation of clear and convincing information and conclusions.

Paperback; 8.5” x 5.5”, 20pp.; Member price- $4.00; Non-member price- $6.00.

This guide is designed to set out principles and some techniques used in appraising construction rocks, viz., crushed rock, sand and gravel, and fill material. Reasons for appraisal include: for government, eminent domain (condemnation), taxation, disposal of land assets, planning, and mineral conservation.

Paperback; 8.5” x 5.5”, 16pp.; Member price- $5.00; Non-member price- $7.00.

This guide outlines an effective organization for common types of geologic reports which are submitted to government agencies, private industry or other employers. The content of the reports, the reasons for the suggested organization and content, and the letter of transmittal are described in sufficient detail to serve as models for actual reports.

Paperback; 8.5” x 5.5”, 12pp.; Member price- $4.00; Non-member price- $6.00.

Guide to Federal and State Appointive Positions (November 1985)
This guide was prepared to assist those who feel strongly motivated to do something about the manner in which our State and Federal governments conduct their affairs. It is designed specifically for those who are interested in public service at the administrative and policy levels that, under most circumstances, are high-level positions secured through appointment by a Governor or by the President of the United States.

Paperback; 8.5” x 5.5”, 10pp.; Member price- $4.00; Non-member price- $6.00.
Program of Cooperative Evaluation of Geology Departments (November 1985)

Another title might be, “How to bridge the gap between geology education and geology professional practice.” The pamphlet provides the guidelines for an evaluation team of professional geologists (representing academics, industry, and government service) to evaluate a college or university department of geology. The evaluation provides the communication of trends in educational practices to potential employers of geologists, so that departments can adapt their programs to the skills needed for their student’s future professional practice.

Paperback; 8.5” x 5.5”, 13pp.; Member price- $4.00; Non-member price- $6.00.

Monograph Series (continued)

Education for Professional Practice (July 1991)

The National Screening Committee (NSC) has struggled with the problem of inconsistencies in curricula for many years. Over time, an informal consensus has evolved among its members as to “what every geologist should know.” This publication summarizes the deliberations and decisions of an ad hoc committee on curriculum, with input from the experiences of the NSC in reviewing the qualifications of geologists applying for Institute certification, and the extensive review and study on the Committee for Cooperative Evaluation of Geology Departments. The pamphlet provides recommendations to college and university geology departments about the necessary skills and core geology courses that students need to be adequately trained in the field of geology.

Paperback; 8.5” x 5.5”, 16pp.; Member price- $4.00; Non-member price- $6.00.

Special Publications


If you have wondered about the actual dangers of asbestos, radon, earthquakes, etc., that are mentioned but not explained very well in the news, then this book is certainly for you. The book was commissioned by the AIPG to give readers knowledge that will save lives and dollars. It explains geologic hazards, the risks these hazards pose, and how professional geologists help to mitigate these risks. The book was written for non-scientists, especially planners, contractors, homeowners, elected officials, insurance underwriters, lenders and financiers, realtors, science teachers, and students. Although geologists have the knowledge that can help reduce the risks, the value of this knowledge will increase greatly when the majority of citizens also understand the hazards and can upgrade public policies that will guarantee that available knowledge is used.

Paperback; 8.5” x 11”, 134pp., illustrated; Member price- $15.95; Non-member price- $19.95.


Set of fifty, 35 mm slides featuring illustrations from The Citizens’ Guide to Geologic Hazards. GREAT FOR TEACHING!

Member price- $65.00; Non-member price- $65.00.

Technical Writing as a Process Within a System (1989)

The book results from short courses that were presented for the 25th Anniversary Meeting of AIPG in autumn of 1988 in Tulsa, Oklahoma, and the Rocky Mountain District of the National Park Service in Spring, 1989. AIPG believes that successful technical writing requires an understanding of both the technical substance of a science and the logic of that science. Technical writing is an interdisciplinary subject that links humanities and the sciences. Unfortunately, it is seldom taught as such. One who masters only the basics of good grammar, organization, and mechanics of writing may be a good writer but never a good technical writer. By the same token, mere technical knowledge and research ability are insufficient in themselves to permit one to be a good writer or to convey knowledge and concepts. The latter skills are learned by study and practice of writing, not by acquiring more technical knowledge.

Paperback; 8.5” x 11”, 68pp.; Member price- $10.00; Non-member price- $15.00.

The Professional Geologist (12 issue subscription)

Paperback; 8.5” x 11”, 26-32pp., published monthly; excludes directory issue; Member price- $20.00; Non-member price- $30.00. Add shipping for Canada- $10.00; All other countries- $18.00.


The ASFE Contract Reference Guide has become one of ASFE’s most significant contributions to practicing design and environmental professionals. This, the third edition, provides an incisive review of significant contract issues, followed by discussion of more than 100 contract provisions.

Paperback; 8.5” x 11”, 168pp.; Member price- $50.00 (Members only)


The central focus of this book is, of course, on ethics as a part of geologic professionalism. AIPG has been at the forefront of promoting a concern with professional ethics and of setting ethical standards for its members and for the geologic profession as a whole. Without a high and rigorously enforced code of ethics, the public, whom we try to serve, will have no faith in our technical competence. There are not always easy answers to making ethical decisions. This book provides a thoughtful compendium, not only of the Institute’s current positions on ethics but also provides an informed discussion of various viewpoints on the application of ethical principles to real-life situations.

Paperback; 8.5” x 11”, 202pp.; Member price- $18.00; Non-member price- $25.00.
This service is open to AIPG Members as well as non-members. The Professional Services Directory is a 12-month listing offering experience and expertise in all phases of geology. Prepayment required. Advertising rates are based on a 3 3/8” x 1 3/4” space.

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Feb. 4-7. The Petroleum Landman’s Association of New Orleans (PLAN0), Tenth Annual Oil and Gas Seminar, Beaver Creek, CO. Contact: David W. Rusch, Suite 203, 1795 West Causeway Approach, Mandeville, LA 70471, Ph.: (504) 626-8484.


Feb. 22-26. 1999 IECA Annual Conference and Trade Exposition will Highlight Payoffs from Investing in Erosion Control, Nashville, TN. Contact: IECA, P.O. Box 774904, Steamboat Springs, CO 80477-4904, Ph.: (800) 455-4322, ecinfo@ieca.org, 9550 Westerville, OH 43081, Ph.: (800) 551-7379, D.C. Contact: NGWA, 601 Dempsey Rd., Denver, CO. Contact: SME, 8307 Shaffer Parkway, Caller No. D, Littleton, CO 80127, Ph.: (303) 973-3000.


Mar. 28-30. 8th Annual Investing in the Americas ’99, Miami, FL. Contact: International Investment Conferences, Inc, 6310 Sunset Dr., Miami, FL 33143, Ph.: (305) 669-1963, e-mail: iiconf@iiconf.com, www.iiconf.com


Jun. 3-5. ICADD-3: from Theory to Practice (3rd International Conference on Analysis of Discontinuous Deformation), Marriott’s Mountain Resort, Vail, Colorado. Sponsored by American Rock Mechanics Association and the ARMA Foundation. Contact: Professor Bernard Amadei, University of Colorado, Dept. of Civil Engineering, CB 428, Boulder, CO 80309-0428, Ph.: (303) 492-7734, amadei@spot.colorado.edu, www.tmn.com/~arma


Jun. 13-17. The Third National Conference of the Geo-Institute of ASCE, Geo-engineering for Underground Facilities, Urbana, IL. Contact: Conferences and Institutes, University of Illinois at Urbana-Champaign, Ph: (217) 333-2880, e-mail: onderdon@uiuc.edu.

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AIPG ANNUAL MEETINGS

October 4-8, 1999 Anchorage, Alaska
October 11-15, 2000 Milwaukee, Wisconsin

AIPG Membership Totals

As of 1/13/98 As of 1/07/99
CPG - Active 4,508 4,384
CPG - Retired 518 527
Cand. for Cert. 58 61
Member 0 12
Registered Memb. 6 14
Associate Memb. 1 4
Student Affiliate 53 76
Honorary 14 17

TOTALS 5,158 5,095

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<th>TYPES OF MEMBERSHIP AND REQUIREMENTS</th>
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<tr>
<td><strong>CERTIFIED PROFESSIONAL GEOLOGIST</strong></td>
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<tr>
<td><strong>EDUCATION:</strong> 36 semester or 54 quarter hours in geological sciences* with a baccalaureate or higher degree; certified copy of official transcripts must be sent by each college or university</td>
</tr>
<tr>
<td><strong>EXPERIENCE:</strong> 8 years beyond bachelor's degree, or 7 years beyond master's degree, or 5 years beyond doctorate</td>
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<tr>
<td><strong>SPONSORS:</strong> 3 required from professional geologists, 2 of whom must be CPG's (see Section 2.3.1.4 of the Bylaws for exceptions)</td>
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<tr>
<td><strong>CERTIFICATION/REGISTRATION:</strong> None required</td>
</tr>
<tr>
<td><strong>SCREENING:</strong> Section and National</td>
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<tr>
<td><strong>APPLICATION FEE:</strong> $50 (to upgrade from Registered Member or Member to CPG, the fee is $35)</td>
</tr>
<tr>
<td><strong>ANNUAL DUES:</strong> $85 plus Section dues; both pro-rated for remainder of year when accepted</td>
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<tr>
<td><strong>MEMBERS</strong></td>
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<tr>
<td><strong>EDUCATION:</strong> 30 semester or 45 quarter hours in geological sciences* with a baccalaureate or higher degree; certified copy of official transcripts must be sent by each college or university</td>
</tr>
<tr>
<td><strong>EXPERIENCE:</strong> No proof required</td>
</tr>
<tr>
<td><strong>SPONSORS:</strong> 2 required from professional geologists, one of whom must be a CPG, Registered Member, or Member</td>
</tr>
<tr>
<td><strong>CERTIFICATION/REGISTRATION:</strong> None required</td>
</tr>
<tr>
<td><strong>SCREENING:</strong> Section and National</td>
</tr>
<tr>
<td><strong>APPLICATION FEE:</strong> $30</td>
</tr>
<tr>
<td><strong>ANNUAL DUES:</strong> $60 plus Section dues; both pro-rated for remainder of year when accepted</td>
</tr>
<tr>
<td><strong>REGISTERED MEMBER</strong></td>
</tr>
<tr>
<td><strong>EDUCATION:</strong> 30 semester or 45 quarter hours in geological sciences* with a baccalaureate or higher degree; certified copy of official transcripts are required for this application if they are not required by the state for registration/certification/licensure</td>
</tr>
<tr>
<td><strong>EXPERIENCE:</strong> No proof required</td>
</tr>
<tr>
<td><strong>SPONSORS:</strong> 2 required from professional geologists, one of whom must be a CPG, Registered Member, or Member; sponsor letters in state registration application may serve as sponsor statements if approved by Executive Committee</td>
</tr>
<tr>
<td><strong>CERTIFICATION/REGISTRATION:</strong> Proof of current registration/licensure; certification must be submitted with application and with annual renewals and must include expiration date</td>
</tr>
<tr>
<td><strong>SCREENING:</strong> National</td>
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<tr>
<td><strong>APPLICATION FEE:</strong> $30</td>
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<tr>
<td><strong>ANNUAL DUES:</strong> $60 plus Section dues; both pro-rated for remainder of year when accepted</td>
</tr>
<tr>
<td><strong>STUDENT</strong></td>
</tr>
<tr>
<td><strong>EDUCATION:</strong> Currently enrolled in a geological science* degree program</td>
</tr>
<tr>
<td><strong>EXPERIENCE:</strong> None required</td>
</tr>
<tr>
<td><strong>SPONSOR:</strong> 1 letter from geological science faculty member</td>
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<tr>
<td><strong>CERTIFICATION/REGISTRATION:</strong> None required</td>
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<tr>
<td><strong>SCREENING:</strong> Headquarters can approve</td>
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<tr>
<td><strong>APPLICATION FEE:</strong> $5</td>
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<td><strong>ANNUAL DUES:</strong> $15</td>
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<tr>
<td><strong>ASSOCIATE</strong></td>
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<tr>
<td><strong>EDUCATION:</strong> None required</td>
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<tr>
<td><strong>EXPERIENCE:</strong> None required</td>
</tr>
<tr>
<td><strong>SPONSORS:</strong> 1 CPG, Registered Member, or Member</td>
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<tr>
<td><strong>CERTIFICATION/REGISTRATION:</strong> None required</td>
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<tr>
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<tr>
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*As defined by the American Geological Institute, a geological science is any of the subdisciplinary specialties that are part of the science of geology, e.g., geophysics, geochemistry, paleontology, petrology, etc.

Note to those who received their degrees from non-U.S./Canadian universities: If you received a degree from a university or college outside the U.S. or Canada, and the school is unable to provide an acceptable transcript, you must submit a copy of your diploma and a list of courses taken. The Screening Committee may ask you to provide additional information or an equivalency evaluation, at your expense.
New Applicants and New Members - (11/25/98 - 01/07/99)

Applicants for certification must meet AIPG’s standards as set forth in its Bylaws on education, experience, competence, and personal integrity. If any Member or board has any factual information as to any applicant’s qualifications in regard to these standards, whether that information might be positive or negative, please mail that information to Headquarters within thirty (30) days. This information will be circulated only so far as necessary to process and make decisions on the applications. Negative information regarding an applicant’s qualifications must be specific and supportable; persons who provide information that leads to an application’s rejection may be called as a witness in any resulting appeal action.

Applicants for Certified Professional Geologists

PA-Dodge, Clifford H.

TX-Ficklen, Holmes D.
8026 Trail Village Dr., San Antonio TX 78244. Sponsors: James Jones, Kevin Sedlak, Michael McDonald.

MA-Harvey, Douglas D.
19 Salutation St. #12, Boston MA 02109. Sponsors: John Lindemann, Eric Rapport, Richard Wong.

OH-Metropulos, Katherine A.
Ohio EPA - NEDO, 2110 E. Aurora Rd., Twinsburg OH 44087. Sponsors: Joan Brasaemle, Alan Jacobs, Christopher Khourely.

MO-Parman, Lynn

LA-Saxton, Deborah C.

OH-Sheehy, Francis D.

NV-Spence, Jeffrey G.
1325 Dogwood Dr., Sparks NV 89431. Sponsors: Dan Zampirro, Robin Hendrickson, Hal Elson.

Upgrading to CPG

NY-Schwartz, Barry A.

WI-Ried, Kathi D.

Applicants for Member

NY-Dwyer, Thomas R.
17 Springbriar Ln., Centereach NY 11720. Sponsors: Craig Werle, George Saver.

NH-Estabrook, Maureen A.
NH Dept. of Environ. Services, P.O. Box 95, Hazen Dr., Concord NH 03301. Sponsors: James Zeppieri, Gregory Kirby.

MO-Rogers, Nickolas R.
Leggette, Brashears & Graham, 4175 Crescent Dr. Ste. C, St. Louis MO 63129. Sponsors: John Bognar, Kenny Nikolaisen.

CT-Snyder, William S.

New Certified Professional Geologists

MI-Bartz, Paul CPG-10368
237 E. Sherwood Rd., Williamson MI 48895, (517) 349-8255

NV-Durgin, Dana C. CPG-10364
3135 Holly Ln., Carson City NV 89704, (702) 849-1804

OH-Forster, Nancy J. CPG-10348
19 Gumbert Drive, Amelia OH 45102, (513) 281-3800

OH-Leung-Wolf, Allen J. CPG-10366
685 Riddle Rd., Cincinnati OH 45220, (513) 563-4222

IL-Nordine, John A. CPG-10370
456 W. Woodland Ave., Lombard IL 60148, (312) 578-9243

MI-Peterson, Mark R. CPG-10345
813 Spring St., Howell MI 48843, (810) 489-0809

IN-Slon, Gregory B. CPG-10367
315 Cardinal Dr., Whiteland IN 46184, (317) 393-0199

AK-Turker, Ali CPG-10362
4808 Maibu Rd., Anchorage AK 99517-3274, (907) 563-3256

MI-Vargo, John S. CPG-10373
1826 Windwingay, Wixom MI 48393, (313) 963-8870, x16

New Registered Member

 WI-Melchiorre, Erik B. RM-0014
1900 Estates Ln. #7, Shawano WI 54166, (715) 789-6141

New Members

MI-Hohnner, Dawn L. MEM-0011
NTH Consultants, 38995 Hills Tech Dr., Farmington Hills MI 48331, (248) 553-6322, x434

MI-Pearson, Sara K. MEM-0012
1346 Hillcrest Ave. NW, Grand Rapids MI 49504, (616) 677-5255

New Student Adjuncts

OH-Adams, Angela L. SA-0122
2160 Rockdell Dr. #13, Fairborn OH 45324, (937) 879-7514

OH-Barnes, Matthew A. SA-0123
4984 Woodman Park Dr. #14, Dayton OH 45432, (937) 775-3455

OH-Buckman, Christopher F. SA-0125
2050 Village Dr. #101, Fairborn OH 45324, (937) 775-3455

OH-Byerly, Sarah E. SA-0124
324 Lovington Dr., Apt. D, Fairborn OH 45324, (937) 775-3455

OH-McKinney, Susan SA-0126
802 West Ln., Lebanon OH 45036

OH-Rose, Emily K. SA-0127
253 W. Dayton-Yellow Springs Rd., Apt. 110, Fairborn OH 45324, (937) 775-3455

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