TPG ARTICLES
New 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 broken down into parts (e.g. part I 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 material, submittals should be sent to AIPG headquarters six months 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 sections:
Title
Author(s) with CPG number and address
Text
Tables if included
Figures with captions if included
Appendix(es) if included
References Cited

One original and two copies of each manuscript should be submitted. Whenever possible, text should also be submitted on diskette (3.5 inch or 5.25 inch IBM/PC format). Headquarters uses DOS WordPerfect 5.1, which is preferred, but Word (for Windows or DOS), ASCII, or translatable files (such as MacWord) are acceptable. The program or format of the text should be clearly marked on the diskette.

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 .dxf, .hgl, .pic, .pcx, .bmp, .eps, .GIF, or other standard formats.

TPG wants color photographs. Photographs alone may be submitted for the cover. They should have a geologic theme and an informational caption.

General Topics:

TECHNICAL
Mining Geology (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, Unusual Applications of Geology.

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

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The Professional GEOLOGIST

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The Summitville Gold Mine And Heap Leach
Part Two: The Lessons & Legacy
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OPINION

United We Stand, Divided We Fall
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BACK COVER - Fall River Road going up to the top of Trail Ridge Road. Photograph submitted by Chuck and Peggy Richter.

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SPECIAL REPORT

Mining Geology - Part 1

Laminated iron ore and banded iron formation at Beeshoek on the southern end of the Postmasburg ridge. Nick Beukes (right) with a visiting geologist from Ghana.
Photograph by Jerome F. Machamer, CPG-7240. Article by Jerome F. Machamer on page 14.
Reflections Of
A Mining Geologist

Robert J. Waidler, CPG-8024

I have worked in the mining industry as a mining geologist for over twenty years for two different companies. The first was located in southeastern Arizona with porphyry copper (Phelps Dodge) and the latest is located in northeastern Minnesota with taconite-iron ore (Eveleth Mines). My duties have included traditional roles of mining geologists; ore quality control, exploration, interpretation of ore body geology; and also engineering roles; mine planning, mine engineering and operations.

I have worked through the changes of technology from mechanical calculators to personal computers, the scaling up of mine equipment and the downsizing of support staff. Some of the greatest lessons and experiences of my career to date have been dealing with people of different backgrounds and skill levels.

In my quest to become more knowledgeable and valuable as an employee, I have found that good "people skills" are as important as the latest technical skills. Today it is not enough to have a technical or scientific education; a person must be able to communicate, respect and understand others.

Mining geology as a profession has been changing ever since being legitimized by the landmark work De Re Metallica by Georgius Agricola in 1556 and translated by Herbert C. Hoover and Lou H. Hoover. The pace of change could be considered as a geometric progression, with early advances in mining geology moving rather slowly (if at all) until the Industrial Revolution demanded increasing quantities of natural raw materials.

Since the beginning of the twentieth century, advances in technology and science coupled with increasing population and demand created by wars has led to the exploitation of mineral resources on a vast scale. Mining geologists work in both free or "unplanned" economies for private companies and government agencies, and in centrally planned economies where all geologists work directly for government.

6) Communications - Extremely important - The mining geologist must be able to intelligently communicate to all levels of both the workforce and the public regarding mining geology.

The qualities needed in a mining geologist to fulfill the above duties include (but are not limited to) the following:
1) A keen sense of observation and natural curiosity.

What of Today?

These are some of the duties that can be expected of today's mining geologist:
1) Exploration - The future of a mine is directly (but no exclusively) related to the known reserves of ore; therefore continuing development of ore reserves is important.
2) Ore Quality - Studies of mineralogy, structure and petrology are important to understanding the orebody geology and devising the most efficient flowsheet.
3) Economics - Studies of mineral recoveries and liberation (related to ore quality), planning and mining sequences, and cut-off grades.
4) Environment - Includes Environmental Impact Statements, permitting, planning, hydrologic studies and controls.
5) Safety - Must be aware of the hazards - both natural and man-made - in the mining environment.
2) A good education that includes technical as well as writing, speaking, personal and management skills.

3) Awareness (and training) concerning environmental issues and their inter-relationships with geology and mining.

4) Motivation to be the best possible mining geologist. Competence is developed through study, practice and exposure.

5) A sense of humor.

**What of the Future?**

What does the future hold for mining geology as a profession? What will be expected of mining geologists relative to education, behavior and function? As responsible professionals we can and do exert a great deal of influence over our destiny. The following items are likely to be important considerations to the mining geologists of the future:

1) An increasing emphasis concerning the quality of our environment, with the realization of limited resources on "space-ship" earth. This should lead to adjustments and additions in the educational systems of tomorrow to incorporate more science with the realization of inter-relationships between the mineral and biotic components of the earth.

2) A continuing trend for mining geologists to become more "professional" through certification and licensing with the objective of having qualified people who are accountable for their work.

3) More focus on ethical behavior as professionals. The education system must take more of a role in providing courses concerning business ethics. In today's changing society it can no longer be assumed that people are aware of many ethical issues.

4) Better public relations between mining geologists (and the mining industry in general) and the general public. The message must go out loud and clear that mining geologists are providing technical services that are essential to our way of life. It has been said before that "If it isn't grown, it must be mined". Unfortunately the general public is unconscious of the critical role of mining in today's society. Most people today are aware of the dangers related to nuclear energy, the toxicity of mercury and lead, and the poisonous nature of arsenic. The mining industry is looked upon as high risk, environmentally destructive and with no place in modern society.

All geologists need to understand and communicate the importance of the mining industry to the general public. Information and service industries cannot replace the wealth that primary industries, such as mining, create. Without mining, there would be no manufacturing jobs, no construction industry, no transportation jobs and no tourist industry.

Mining companies have demonstrated that mining can be done safely and cleanly, with minimal effects on the environment. As a mining geologist, I am proud to be part of one of the basic industries that provides tremendous benefits for mankind.

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*Robert J. Waidler, CPG-8024, Virginia, Minnesota.*

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**Western Mine Engineering, Inc. And EGM Ltda. Announce Joint Venture Agreement**

Western Mine Engineering, Inc. of Spokane, Washington, U.S.A and EGM Ltda. of Santiago, Chile are pleased to announce the signing of a joint venture agreement to develop, market, and support mine evaluation software in the Latin American market.

Western Mine Engineering, publisher of *Mining Cost Service*, produces and distributes two software products, *Sherpa* and *Apex*, for use in mine evaluation work. *Sherpa* aids in the task of estimating mining costs and *Apex* helps perform the financial analysis end of a feasibility study.

Up to this time, international sales and support of these packages were handled directly out of Western's office in Spokane. This agreement will allow Western and EGM to better serve the highly active Latin American market. EGM will market, support, and help adapt the software for use in Latin America.

"We talked to a number of good companies before settling on EGM, Ltda." said Otto Schumacher, Western's President, "We were looking for a well-respected company with an established track record in mining evaluation work." EGM Ltda., headed by Guillermo Rochefort and Sergio Vicencio, is a ten-year-old geological consulting firm serving a broad base of clients in the areas of exploration project management, ore reserve definition, and mineral deposit evaluation. They also represent Geostat Systems in Santiago.

For information about *Apex*, *Sherpa*, or *Mining Cost Service* contact Western Mine Engineering at Tel: (509) 328-8023, Fax: (509) 328-2028; or EGM Ltda. at Tel: (56 2) 233 5227, Fax: (56 2) 232 6020.
President's Message

Richard C. Fountain, CPG-1750

We are at the beginning of a new year in which we should consider both the short- and long-term goals of the Institute. The goals that we set should be based on professional and ethical standards for which the Institute stands and should be goals that can be met. Like my predecessor, Russ Slayback, I have never served as president of a national geologic organization. In reviewing his article in the January, 1994, issue of The Professional Geologist in preparation for my message, I will say that he certainly met his first goal, and that I hope that I am able to do the same. Russ Slayback has been an outstanding president of AIPG. One of many in the long line of those who have served AIPG in this capacity. If I can achieve the level of success in 1995 that Russ achieved last year, I will have been a successful president.

We have seen a lot of progress in AIPG over the past several years, particularly in 1994 with a growing continuity among its leadership. At the beginning of my term as AIPG's thirty-first president, I not only would like to strengthen some of the objectives and goals of my predecessor, but add a few.

AIPG Membership

AIPG reached the threshold of 5,000 members before the end of 1994. This is an accomplishment in itself. This membership strength has been eluding us for many years. However, by being able to keep active members and by having an accelerated rate of growth of the certification of new applicants, we were able to reach that goal. I would like to move that goal out a little further by asking each member to try to bring in a candidate to seek certification in 1995. If this could be done, our membership could increase by ten percent or more. An addition of 500 members is a goal that I am asking each of you to help AIPG achieve in 1995.

Continue To Strengthen The Governmental Affairs Program

Bob Merrill, a past Secretary of AIPG and President-elect for 1996, chaired the National and International Affairs Committee last year and performed a commendable job. He has agreed to chair the committee again in 1995 and hopes that his committee members will continue working with him to develop various position papers on issues that arise from time to time affecting geologists. We feel that this committee's activity last year was influential on various issues dealing with the mineral and energy industries that were brought before the U.S. Congress. Position papers developed by this committee on an as needed basis are reviewed and modified as necessary by the Executive Committee prior to being published or being presented before legislative bodies. In 1994 the committee charge was expanded to include International Affairs as a result of the growth in opportunities as well as in the necessity for geologists to be involved in the international marketplace. AIPG will continue to support the AGI Governmental Affairs Program in 1995.

AIPG Publications

As we all recognize, The Professional Geologist has continued to improve over the years as has the quality of

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Short-Course Series

Statistical Methods in Ground-Water Pollution

February 27-March 3, 1995

Instructors:
D. Helsel and E. Gilroy (USGS)

This course focuses on the basis of modern statistical methods, increasingly used to analyze ground-water flow and water quality data; extensive discussions of applications to actual data sets; includes hands-on training with MINITAB® statistical software.

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igwmc international ground water modeling center

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Golden, Colorado 80401-1887
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our other publications. Charles Wm. Dimnick has performed an admirable job in the past two years as our editor, and we are confident that the incoming editor for 1995 and 1996, Lyle G. Bruce, will do the same. New ideas regarding AIPG publications and continuing improvement in their quality is our goal in 1995. The submission of quality articles by our members is a prerequisite to the success of our publication as is the advertising which has followed The Professional Geologist to mature.

National And Section Communications
Steve Testa, Vice-President in 1994, set a goal for that office to help strengthen communications between national and the respective sections. This was done by developing communications with section officers, keeping them informed of various functions of AIPG on the national level, and, in turn, informing the national officers and Executive Committee members of the sections’ activities. Steve has given the incoming Executive Committee some very sound suggestions and advice for the duties of the office of Vice-President, which this year will be filled by Tom Falls. Tom’s efforts in maintaining more timely communications between national and section members will strengthen AIPG as a whole. As a goal for 1995, each section, through its president, should strive to update Tom on its activities on a quarterly basis.

Applicant Processing
The processing of applications for certification has been streamlined over the past two years with the guidance of Bob Pakundiny, committee chairperson for 1993 and 1994. Under his guidance and the efforts of those serving with him on this committee, applicant processing time has been very reasonable. The applicant processing procedures have been streamlined for 1995, and this year’s chair of the National Screening Committee, Steve Testa, and the committee members will continue to enhance the process.

State Registration
AIPG’s position on state registration or licensing of geologists has been misunderstood over the past years by some of our membership. AIPG has been, and will continue to be, supportive of local efforts to achieve registration or licensing status. It will continue to aid this process when necessary and when requested by local sections.

Continuing Education
The mechanism for the implementation of a meaningful Continuing Education program has been developed. It will be the goal of AIPG to consummate an agreement with the selected contractor and to have the first phase of the program implemented in 1995.

Intersociety Relations
The need for a more formal way to communicate with other societies dealing with the professional aspects of the geological sciences has been recognized by AIPG. In 1995 a committee, to be chaired by Russ Slayback, will be formed to work closely with other professional organizations such as AAPG, AEG, AGI, GSA, and others. This committee will attempt to keep us informed on matters being considered by these other professional organizations. Professional certification or registration, specialty certification, and other matters are areas in which AIPG and other professional organizations may interact. Our goal in 1995 is to develop a better mutual understanding and working relationship along these lines with other societies.

Student Affiliation
One of our goals in 1995 should be the establishment of several student chapters of AIPG at various universities across the country. Since a procedure for the establishment of the student chapters was developed, none have been established. Any faculty member or student interested in pursuing the establishment of a student chapter of AIPG is encouraged to contact me or headquarters as soon as is practical. The establishment of several student chapters of AIPG across the country is a primary goal that I have set for 1995 in hopes that their development will lead not only to additional applicants for certification in the future but will instill in the students early in their professional career the awareness of professionalism and ethics which in later years will bring them peer recognition as geologists practicing their chosen profession.

With these goals in mind, I welcome any new ideas or programs that AIPG can realistically pursue. Your comments will be brought to the attention of the Executive Committee and some action taken. Let each one of us do our part for AIPG in 1995 by soliciting new applicants for certification and by actively participating in your organization.
The Summitville Gold Mine And Heap Leach Part One: The Problems

James A. Pendleton, PhD., CPG-3768

Introduction

On December 4, 1992, Summitville Consolidated Mining Company, Inc., a subsidiary of Galactic Resources, Ltd. of Vancouver, Canada, informed the State of Colorado of its intention to declare bankruptcy and to abandon its Summitville mine and heap leach after December 15, 1992. The heap leach was within five feet of overtopping the containment dike, and copper-acid water was discharging untreated from an adit drain. Having no emergency response capability, Colorado requested assistance from the U.S. Environmental Protection Agency. The Summitville mine site was placed on the National Priorities List on May 31, 1994. The lessons and legacy of the Summitville mine will probably influence the future operation, regulation and cleanup of mine sites in the U.S. for the foreseeable future.

The Summitville Mine Site Problems

In 1984, Galactic leased the Summitville property and obtained a permit for a limited impact pit and test heap leach. The test was pronounced a success in the fall of 1984. Galactic obtained a mine permit for the full-scale open pit and heap leach in October of 1984. Construction commenced in the summer of 1985, continued through the winter, and concluded during the summer of 1986. Considerable difficulty was encountered due to the extreme winter conditions at 11,500-foot elevation, which resulted in damage to the heap leach liner. With the liner presumably repaired, the operation began heap leaching in early summer, 1986.

The Heap Leach Problems

Cyanide processing solution was first applied to crushed ore on the heap leach in June of 1986. Within a month cyanide was detected in the leak detection layer beneath the primary fabric liner. The following month cyanide was detected in the underdrain beneath the secondary compacted clay liner. Galactic was allowed to construct a sump to capture and pump back contaminated fluids to the heap for containment.

The original permit application included a water balance calculation for the heap leach. This water balance projected an excess of evaporation over precipitation. However, this water balance was in error. Due to an excess of precipitation over evaporation, and the pump back of contaminated fluids to the heap leach, the heap accumulated water.

From mid-1987 through the late fall of 1990 the Summitville mine experienced a series of broken pump-back pipelines, broken pumps and erupting springs, resulting in releases of cyanide-contaminated fluids. The original design of the mine as a "zero-discharge" facility having proven incorrect, Galactic was required to install a treatment plant to treat and release the accumulating cyanide-contaminated heap solution. This water treatment plant was installed in 1989. The operator's prolonged attempts to perfect its water treatment plant failed. During 1989 and 1990 Galactic attempted land application to dispose of treated effluent. The land application project resulted in overland flow into Wightman Fork and Galactic was

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again cited for water quality violations. The inefficient and hazardous heap leach apparently bankrupted the operator and led to an emergency response by the EPA. Between December 16, 1992 and June, 1994, the EPA expended approximately $30 million treating water at the Summitville site. The majority of the treated water came from the heap.

The Acid Waste Rock Drainage Problem

Much of the regulatory attention has focused on the heap leach pad. However, significant additional environmental issues developed from acid and metals contamination from the site's waste rock piles. The waste rock was inadequately characterized during the permitting process. The original limited impact permit application stated that, because the ore and waste rock would come from the "oxide" zone they would have no acid-generating potential. This observation was grossly in error. Base metal sulfide minerals in the waste rock are now being weathered and acid and metals are being released to the ground and surface waters. Further, without permit approval, Galactic carelessly placed this waste material in a boggy area of the Cropsy Creek valley. The Cropsy waste pile subsequently became saturated with groundwater which drains down slope beneath the heap leach into the underdrain. In the underdrain, the approximately 2.5 pH waste pile effluent is contaminated by leaking heap solution and must be returned to the heap to contain contamination.

Based upon the 1993 water quality monitoring data, approximately 50% of the mine site's copper metal contaminant loading, as high as 9,000 pounds per day, comes from the various waste piles. These sources include the heap underdrain, the Cropsy waste pile and several other waste disposal areas, the Beaver mud dump, and the North waste rock dump. As of August, 1994, contracts had been issued to return two-thirds of the Cropsy waste pile to the mine pit at a cost of $17.7 million.

The Adit Drainage Problem

At some point in the development of many historical mining districts in Colorado, some enterprising individual dug a dewatering tunnel to lower the water table and facilitate deeper mining. At Summitville the dewatering tunnel is the Reynolds Adit. The Reynolds Adit, which is located near the base of South Mountain and beneath the pit excavated by Galactic, was completed in 1897. The Adit flows continuously, varying from approximately 100 gallons per minute in the winter to an average annual high of approximately 800 gallons per minute during spring melt.

Because the Reynolds Adit drains both the ore body and the adjacent mineralized alteration zone, it historically contained relatively high metal contents. Prior to 1988, copper content typically reached approximately 30 milligrams per liter. Beginning in 1988, however, the metals concentration of the Reynolds Adit effluent began to increase. By mid-1992 the effluent had reached about 130 milligrams of copper per liter. In 1993 the Reynolds adit effluent copper content peaked at 650 milligrams per liter.

While the mechanism is not completely known, it appears that excavation of the undrained open pit above the Reynolds Adit and associated underground workings stimulated increased infiltration, oxidation and flushing of the ore body and adjacent alteration zone. In turn, this resulted in the increased release of acid and metals from the pit and old underground workings to the Reynolds Adit. To compound the problem, the highest contaminant concentrations occur in conjunction with the highest seasonal flows. Based upon 1993 water quality monitoring data, it appears that approximately 50% of the site's copper contaminant loading, as high as 9,000 pounds per day, issued from South Mountain via the Reynolds Adit. During the winter of 1993/1994, in an attempt to stem this contaminant flow, EPA placed plugs in the Reynolds and associated Chandler adit at a cost of approximately $1 million. It is too early to evaluate the success of this emergency response action.

Cleanup Cost Projections

Numerous individuals interested in the Summitville mine site controversy have volunteered projections of the possible cost of cleanup of the site. Estimates have ranged from an unrealistic high of $1 billion by the Mineral Policy Institute to an overly conservative $23.6 million by Galactic prior to its bankruptcy. As of June, 1994, $40 million had been expended, of which $30 million had been dedicated to water treatment. EPA has publicly projected the cleanup cost at $120 million. None of these estimates have considered the costs of post-cleanup operation and maintenance, which would be borne by the State.

Conclusion

The Summitville Mine has been, and will be, unsatisfying for the State of Colorado, the mining industry, the EPA, the environment, and the public, unsatisfying in terms of impact to the natural environment, public expense, industry morale, and the conduct of business. It is unfortunate that any lesson must be learned at such extreme an expense. The Summitville Mine situation, portrayed as typical of the undesirable consequences of mining, has received intense scrutiny. This anomalous example of mining at its worst has become the environmental advocates' "poster child" for mining-law reform. In Part Two I will summarize the lessons and legacy of the Summitville mine for mine operators, mine regulators, and the public.

James A. Pendleton, PhD., CPG-3768, is the Technical and Scientific Coordinator for the Colorado Division of Minerals and Geology and represents the Division on the EPA Summitville Superfund Technical Advisory Team.
The Summitville Gold Mine
And Heap Leach
Part Two: The Lessons & Legacy

James A. Pendleton, PhD., CPG-3768

Introduction
Many of these lessons were evolving prior to the Summitville bankruptcy. While I often disagree with the host of rapidly emerging Summitville "experts", many of whom imply these lessons evolved instantaneously from the Summitville situation, I believe it of value to summarize the lessons so graphically exemplified by the Summitville mine site. Further, I believe many of these lessons portend a legacy for the mining industry, regulatory agencies, and the public. Many of these legacies have already been manifested in Colorado through regulations adopted since the bankruptcy of Galactic Resources Limited. And many will be repeatedly cited during the on-going debates concerning the 1872 Mining Law and the CERCLA reauthorization.

Comprehensive Baseline Data Collection
In the absence of baseline data, particularly water quality contaminant loading data, it is difficult to assess a mine's potential impacts to the environment. It is impossible to recreate pre-disturbance water quality for determination of cleanup targets. Lacking data with which to defend themselves, most potentially responsible parties (PRPs) may be hard pressed to limit their liability. Summitville baseline data was also inadequate to characterize the acid- and toxic-forming character of the waste rock. At the time Summitville was permitted, operators were not required to collect baseline data. As of July, 1994, Colorado regulations require that operators collect a minimum of five-quarters of surface water and ground water baseline data, and that they characterize the ore, waste and country rock that may be disturbed by the proposed mining. All operators will have to withstand the time and expense of baseline data collection, analysis and interpretation.

Reliance on "Zero-Discharge" Classification
Operators are not statutorily required to obtain an NPDES for a "zero discharge" facility. Health Departments routinely recommend baseline data collection but most cannot require it for "zero-discharge" facilities. If the Division of Minerals and Geology did not require collection of baseline data, little would be collected. The EPA also has no authority to deny a zero-discharge" permit for lack of baseline data. EPA includes a warning in its permits. Realistically, if a violation occurs, the mine operator will be "enforced" into bankruptcy. Even though we continue to accept "zero discharge" design assumptions, five-quarters of baseline hydrologic data is now required to verify nil impact. Operators will be responsible for the baseline data collection.

Increased Scrutiny of Environmentally Sensitive Mines
The Colorado Mined Land Reclamation Board adopted a new model for issuing permits for "Chemical Processing and Designated Mining Operations" (DMOs). These permits now include requirements for environmental protection plans, including detailed emergency response plans. Operators are subject to the expense of plan preparation and the risk of mounting an emergency response.

Phased Building-Permit-Type Inspections
Operators of DMOs are subject to phased inspections during construction of the facility. The facility can be operated only after construction has been completed in
compliance with the approved plan and regulatory standards. All DMOs will suffer this additional uncertainty and scrutiny.

**Strict Third-Party Certification**

Summitville's liner was the subject of an engineer's certification which exempted portions of the facility. All environmentally sensitive facilities, such as liners, will require a detailed certification by a third party professional. No exemptions for lapse in observation will be tolerated. All operators will have to accept the expense and delay of certification.

**Increased Monitoring and Self Reporting**

The Division requires that critical operational and environmental monitoring data be evaluated periodically and reported promptly. Colorado statutes now require an operator to immediately self-report potential threats to the environment or the public health.

**The Maintenance of Adequate Surety**

Until July, 1994, Colorado operators enjoyed the protection of a grandfather clause which exempted them from compliance with regulations adopted subsequent to approval of their permits. The Mined Land Reclamation Board now has the authority to increase the bond for any mine site if it is determined that the site is insufficiently bonded. An inflation indexing factor is also included in all existing and new permit bond determinations. Bonds are periodically re-evaluated. Previously bonds could be increased only in the event of a violation. Operators are now subject to the prospect of escalating surety requirements.

**Restriction of Surety Forms**

Prior to July, 1994, Colorado statute and regulations allowed surety to be submitted in a selection of forms, including cash, certificates of deposit, treasury certificates, insurance bonds, equipment salvage credit, corporate self surety, and real estate deeds of trust. Recent experiences at mines such as Summitville and Mid-Continent Resources have caused a significant restriction of acceptable surety forms and increasingly stringent methods for surety evaluation. Many operators will suffer increasing cost in providing acceptable surety.

**Compliance with Evolving Regulations**

By statute, the Board used to issue permits for the "life-of-mine". The Board now has the authority to apply new permitting requirements to existing permits, if demonstrated necessary to prevent environmental impact.

**Comprehensive Review of Permit Applications**

As of July, 1994, the Mined Land Reclamation Board received authority to extend the current automatic permitting provision requirement from 120 days to 180 days, when necessary to allow a thorough review of a complex application. The Board also granted the Division authority to hire outside contractors, paid by the applicant, to assist in evaluating complex permitting issues for which the Division had inadequate manpower. The operator must accept the delay and additional cost represented by extended and comprehensive permit scrutiny.

**Extended Reclamation Success / Liability Period**

To prevent unforeseen environmental complications, Colorado statute now allows an extended five-year reclamation liability period after the completion of all reclamation requirements. A portion of the bond is retained until all reasonable concerns have been satisfied. Operators will risk the increased uncertainty and carrying expense of lengthened surety liability periods.

**More Deliberate Enforcement**

Summitville Consolidated Mining Company, Inc. was cited for loss of containment within one month following application of processing solution. However, the operator's impressive selection of professional consultants postured innumerable scenarios to explain the problems. The Board elected not to shutdown the operation, rather SCMC1 was directed to institute remedial measures, all of which failed. The Board has directed the Division to be much more deliberate in pursuing enforcement of potential violations at DMOs. Future enforcement actions will err in the interest of preventing environmental impact. Operators will experience more stringent and deliberate enforcement with its attendant risk of increased cost and operational delays.

**Creation of State Emergency Response Fund**

Finally, the Colorado Legislature authorized creation of a State emergency response fund to allow the State to react in situations where operators are unwilling or incapable of correcting hazardous environmental conditions.

**Conclusion**

The Summitville Mine has been, and will be, unsatisfying for the State of Colorado, the mining industry, the EPA, the environment, and the public. Unsatisfying in terms of impact to the natural environment, public expense, morale, and the conduct of business. It is unfortunate that any lesson must be learned at so extreme an expense. The lessons learned from the Summitville experience portend a significant legacy for mining operators and regulatory agencies. Realistically, that legacy involves increased risk, expense, and prolonged project startup and operation.

*James A. Pendleton, PhD., CPG-3768, is the Technical and Scientific Coordinator for the Colorado Division of Minerals and Geology and represents the Division on the EPA Summitville Technical Advisory Team.*
Compensation of Professional Geologists

Sponsored by the American Institute of Professional Geologists (AIPG), this massive, tightly-packed report provides the most intensive and extensive study of salaries and bonuses ever attempted in the field of geology. Pay data for over 1,400 geologists are reported by:

- type of employer
  - size of organization
    - region/state/metropolitan area
    - geological specialty
  - level of education
    - length of experience
    - level of professional responsibility
  - certification & registration/licensure
  - level of supervisory/managerial responsibility

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  - size of organization
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What Goes Around, Comes Around

*Conglomerate iron ore pits on an Early Proterozoic pediment.*

**Jerome F. Machamer, CPG-7240**

In March, 1970, I was working for United States Steel Corporation, and had just come off a tour of duty at Serra dos Carajas, in Brazil, where a feasibility study on the development of the Carajas iron ore deposits was being carried out. On return to Pittsburgh, I was asked to go to South Africa to examine the iron ore and manganese deposits in the Postmasburg and Kalahari districts in northern Cape Province. Of course, I jumped at the chance.

Now, the morphology and surficial deposits of the Carajas area are distinctive, and typical of those associated with outcrops of Precambrian oxide facies banded iron formations (itabirites) throughout much of the world. The silica in the itabirite is leached out, leaving a residual accumulation of platy iron oxide fragments in a matrix of dusty hematite. Any ferrous iron that may have been present is dissolved in ground water and is then precipitated as goethite or hematite as soon as the water reaches an oxidizing environment. The result is a laterite crust formed of a ferric oxide cement and fragments of whatever rock or rock products were present on the surface where the iron oxide precipitated. This is what the Brazilians call "canga". Very typically, a special kind of canga ("canga rica"), in which the rock fragments are platy iron ore fragments from the iron oxide bands of the banded iron formation, forms adjacent to outcrops of the residual iron ore.

The iron ores of the Postmasburg district are typical Precambrian iron ores formed by the oxidation, leaching, and enrichment of a banded iron formation. In the case of Postmasburg, the ores had been covered by younger sediments, further buried beneath a regional thrust fault, metamorphosed, and subsequently re-exposed when the overlying rocks were eroded away. Recent work suggests
that the rocks overlying the ore are at least 2 billion years old, and that the weathering that formed the ore took place about 2.2 billion years ago.

One day during the examination, we stood on an outcrop at the north end of the ridge that is the Postmasburg district, overlooking what was to become the giant Sishen iron ore mine. The outcrop was composed of tough, laminated iron ore, formed by the impregnation of typical residual iron ore with lateritic, secondary iron oxide cement. Around us were boulders of what the South Africans call "conglomerate iron ore" - in reality a canga rica virtually identical to that which I had seen at Carajás. Only this was a fossil canga.

In September, 1993, almost a quarter-century after my first visit, I was privileged to participate in the International Geological Correlation Program (IGCP) Project 318 workshop on the manganese and iron-bearing rocks of the Transvaal Supergroup, led by Nick Beukes of Rand Afrikaans University and Arno Kleyenstuber of MINTEK. One day we stood on the southern end of the Postmasburg ridge, at the Beeshock iron mine. The ridge is formed by the same banded iron formation, again with an overlying cap of residual iron ore. On the flats below us (the pediment) were several smaller mining operations, by their color clearly iron ore mines. Almost certain of the answer before phrasing the question, I asked Nick what kind of ore was being mined from those pits down on the flats.

That's when it began to come around. The answer, of course, was "conglomerate iron ore". Everything was right where it should be: the itabirite, with its cover of residual iron ore, made the ridge; the coarse iron ore fragments, washed off by erosion, formed the gravels at the base of the hill; the secondary iron oxide, dissolved from the parent itabirite, cemented everything together. The marvelous thing is that the hill on which we were standing, and the entire landscape before us, was essentially as it had been before the sediments overlying the ores had been deposited. We were looking at an Early Proterozoic world, probably about 2.2 billion years old, on which the only things new were the plants and a few funny animals!
There are sidelights to this tale that are of scientific, economic, and entertaining interest. There is some debate about the timing of the oxidation and enrichment of some Precambrian banded iron formations: in this case the answer is at least 2 billion years. Metamorphism of the iron ore fixed alkalies by the formation of sericite, decreased permeability, and increased grain size by recrystallization; all with an adverse effect on the smelting characteristics and value of the ore.

I was accompanied on the 1970 examination by the late Ted Bear, a geologist from Johannesburg, and Jurgen Oosthuizen, the regional geologist for Associated Manganese Mines of South Africa (our host). Remember that we were on the edge of the Kalahari Desert. Standing on that outcrop above Sishen, with a good pair of field glasses we could have read the sign on the hangar at Hotazel, which we had visited the day before. Ted asked Jurgen what it was like in the summertime. Jurgen, with a deadpan that would have put Bob Hope to shame, replied "Ot as 'ell, man, 'ot as 'ell!" When I was able to stop laughing, I took the photo of the two of them, surrounded by iron ore boulders, on a 2.2 billion-year old ridge overlooking Sishen.

References

Jeff Machamer is a consulting geologist in Arlington, Virginia who is particularly knowledgeable in iron and manganese ores. Prior to establishing his consulting practice, he was associated with the International Department of the former United States Steel Corporation and subsequently with the United States Bureau of Mines.

New USBM Director Sworn In

Rhea L. Graham, a geologist with a background in environmental consulting and engineering geology, became the 19th director of the U.S. Bureau of Mines (USBM) October 17, 1994. Graham, who was sworn in by Secretary of the Interior Bruce Babbitt, takes over an agency that is redirecting its programs and reorganizing its operations.

"I am excited about leading the USBM at this critical time," Graham said. "I believe that the agency has a vital role to play in helping the Nation solve its mineral-related problems--problems that involve our environmental and economic goals as well as basic human issues such as worker health and safety."

"Our challenge will be to make meaningful contributions while we respond to budget reductions, reorganization, and governmentwide streamlining," Graham added.

As a senior scientist with Science Applications International Corporation (SAIC) in Albuquerque, New Mexico, Graham worked with government agencies on reinvention efforts that reshaped programs to follow a more environmentally-focused paradigm. She also helped resolve systems integration issues involved in bringing organizations together for maximum effectiveness.

Graham comes to the USBM as it begins a major reinvention effort--one that addresses both the recommendations of Vice-President Gore's National Program Review and the relevancy of the agency's programs. The USBM plans to expand its work in environmental remediation and pollution prevention; target health and safety research to high-priority issues; and improve its collection and analysis of minerals information and increase public access to that data.

"The mission of the USBM has not changed per se, but the area in which that mission operates is much more complex than before. Our approach must change to be responsive to today's reality. I am honored that the President has asked me to make that change happen," Graham said.

Graham, who has extensive experience in the minerals industry, served as the administrator of the Mining and Minerals Division of the State of New Mexico Energy, Minerals and Natural Resources Department. She also worked as manager of environmental sciences for an Albuquerque-based environmental consulting firm.

Graham received her formal training in geology at Bryn Mawr College (A.B., 1974 and earned a master's degree in oceanography (1977) from Oregon State University. She recently worked on a National Academy of Science panel reviewing the USBM's research programs in occupational health and safety. A native of Terre Haute, Indiana, she is the first woman and first African American to serve as director of the 84-year-old agency.

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UNITED STATES 1006
AGENCY: Dept. of the Int./Office of Surf. Mining Reclam. and Enforcement
TOPIC: RESOURCE MANAGEMENT AND PRESERVATION -- 16
SUMMARY: Amends certain portions of the Department's permanent program regulations governing permanent and temporary impoundments at surface and underground mining operations.
AGENCY CONTACT: Donald Stump, Office of Surface Mining Reclamation and Enforcement, US Department of the Interior, Ten Parkway Center, Pittsburgh, PA 15220, (412)937-2164.
CITATION: 30 CFR 701, 780, 784, 816, AND 817
ADOPTION DATE: 10/20/94
EFFECTIVE DATE: 11/21/94

UNITED STATES 1089
AGENCY: Dept. of the Int./Office of Surf. Mining Reclam. and Enforcement
TOPIC: RESOURCE MANAGEMENT AND PRESERVATION -- 16
SUMMARY: Requires that the regulatory authority provide to each person who was a party to an informal conference its written findings granting, requiring modification of, or denying a permit application.
CITATION: 30 CFR 773
PROPOSAL DATE: 10/26/94
COMMENT DEADLINE: 12/27/94

UNITED STATES 29500
AGENCY: Department of the Interior/Minerals Management Service
TOPIC: RESOURCE MANAGEMENT AND PRESERVATION - 16
SUMMARY: Amends the regulatory program of the Minerals Management Service (MMS) to state specifically the authority of MMS to require lessees or operators to conduct archaeological resource surveys and submit reports prior to exploration, development, and production, or installation of lease term or right-of-way pipelines.
CITATION: 30 CFR 250, 256, 280, 281
PROPOSAL DATE: 10/12/93
COMMENT DEADLINE: 12/13/93
ADOPTION DATE: 10/21/94
EFFECTIVE DATE: 11/21/94

UNITED STATES 94
AGENCY: Department of Energy/Nuclear Regulatory Commission
TOPIC: ENERGY -- 7
SUMMARY: Allows private ownership of Low-Level Radioactive Waste facility sites as an alternative to the current requirement for Federal or State ownership.
AGENCY CONTACT: Mark Hasfield, Office of Nuclear Regulatory Research, U.D. Nuclear Regulatory Commission, Washington, DC 20555, (301)415-6196
CITATION: 10 CFR PART 61
PROPOSAL DATE: 06/03/94
COMMENT DEADLINE: 12/02/94

KENTUCKY 9645
AGENCY: Natural Resources and Environ. Protection Cabinet/Div. of Water
TOPIC: RESOURCE MANAGEMENT AND PRESERVATION -- 16
SUMMARY: Establishes the requirement to prepare and to implement groundwater protection plans to ensure protection for all current and future uses of groundwater and to prevent groundwater pollution.
AGENCY CONTACT: Jack A. Wilson, Division of Water, Department for Environmental Protection, Natural Resources and Environmental Protection Cabinet, 14 Reilly Road, Frankfort, KY 40601, (502)264-3410.
CITATION: 401 KAR 5:037 Groundwater Protection Plans
PROPOSAL DATE: 05/01/94
ADOPTION DATE: 08/24/94
EFFECTIVE DATE: 08/24/94

MAINE 4785
AGENCY: Board of Licensure for Professional Land Surveyors. Seeks to further define the statutory language for Continuing Education.
TOPIC: BUSINESS AND CORPORATIONS -- 2
SUMMARY: Pertains to licensure for professional land surveyors. Seeks to further define the statutory language for Continuing Education.
AGENCY CONTACT: Kelly Webster, Board of Licensure for Professional Land Surveyors, State House Station, #35, Augusta, ME 04333, (207)828-8723.
CITATION: (UNCODIFIED) Professional Development
PROPOSAL DATE: 10/05/94

MARYLAND 4820
AGENCY: Department of Natural Resources
TOPIC: RESOURCE MANAGEMENT AND PRESERVATION -- 18
SUMMARY: Pertains to changes to the regulations implementing the Nonfederal Wetlands Protection Act to include the Critical Area and implementation of mitigation banking in those areas.
AGENCY CONTACT: Heather C. Harris, Water Resources Administration, Tawes State Office Building, E2, Annapolis, MD 21401, (410)874-2265.
CITATION: COMAR 08.05.04.01 - .04, .06, .09, .14, .15, .22 Nonfederal Wetlands
PROPOSAL DATE: 09/24/94
COMMENT DEADLINE: 07/28/94
ADOPTION DATE: 09/20/94
EFFECTIVE DATE: 10/24/94

MARYLAND 4873
AGENCY: Department of the Environment
TOPIC: ENVIRO. PROTECTION AND POLLUTION CONTROL -- 8
SUMMARY: Establishes a general permit for surface coal mines and their related facilities; increases the Department's efficiency by allowing the Department to address a large group of discharges in a single action.
AGENCY CONTACT: Deanna L. Miles-Brown, Regulations Coordinator, Office of Community Assistance, 2500 Broening Highway, Baltimore, MD 21224, (410)393-3173.
CITATION: COMAR 26.08.04.09 - .01; Permits
PROPOSAL DATE: 07/22/94
COMMENT DEADLINE: 08/23/94
HEARING DATE: 08/09/94
ADOPTION DATE: 09/21/94
EFFECTIVE DATE: 10/24/94

MARYLAND 5026
AGENCY: Department of the Environment
TOPIC: ENVIRO. PROTECTION AND POLLUTION CONTROL -- 8
SUMMARY: Revises regulations that govern the design of sanitary landfills which are authorized to accept waste from the construction, demolition, and land clearing debris industries only. States that is class of landfill, referred to as rubble landfills, have before now been constructed with no barriers to prevent the migration of pollutants which might be contained in the landfill into underlying ground waters other than the protection provided by the natural geologic materials occurring there. Requires that impermeable liner and leachate collection system be designed and installed in any future rubble landfill, and will require the upgrading of existing facilities to meet the standard by March 31, 1998.
AGENCY CONTACT: Deanna L. Miles-Brown, Regulations Coordinator, Office of Community Assistance, 2500 Broening Highway, Baltimore, MD 21224, (410)393-3173.
CITATION: COMAR 26.04.07.16 AND .17 Solid Waste Management
PROPOSAL DATE: 10/14/94
COMMENT DEADLINE: 11/17/94
HEARING DATE: 11/17/94

MINNESOTA 1535
AGENCY: Board of Water and Soil Resources
TOPIC: RESOURCE MANAGEMENT AND PRESERVATION -- 18
SUMMARY: Relates to comprehensive local water planning; includes definitions, purposes of planning process and scope of plan, procedures for water planning, executive summary, data consistency with Planning/Land Management Information Center guidelines, physical environment, land use, and development, surface water, groundwater, and related land resources, assessments and impacts of expected changes to surface water, groundwater, and related land resources.
AGENCY CONTACT: Douglas J. Thomas, Water Planning Coordinator, Board of Water and Soil Resources, Southbridge Office Building, 155 South Wabasha, Suite 104, St. Paul, MN 55107, (612)297-5617
CITATION: MCAR 9300.0010 - 9300.0210 Comprehensive Local Water Planning
PROPOSAL DATE: 10/17/94
COMMENT DEADLINE: 11/16/94

MISSOURI 6158
AGENCY: Department of Natural Resources/Land Reclamation Commission
TOPIC: RESOURCE MANAGEMENT AND PRESERVATION -- 18
SUMMARY: Clarifies language as it pertains to permit application requirements for industrial mineral operations.
AGENCY CONTACT: Department of Natural Resources, Land Reclamation Program, Charles A. Steffermann, Staff Director, P.O. Box 176, Jefferson City, MO 65102
CITATION: 10 CSR 40-10.010 - .040, .050, .070, .080 Permit Requirements for Industrial Mineral Operations
PROPOSAL DATE: 06/17/94
ADOPTION DATE: 10/17/94
EFFECTIVE DATE: 11/17/94

MISSOURI 6158
AGENCY: Department of Natural Resources/Land Reclamation Commission
TOPIC: RESOURCE MANAGEMENT AND PRESERVATION -- 18

F. B. "Ted" Mullin, CPG-1716

Happy New Year To All!

I made a comment in this column last month that there would be interesting times along the Potomac with all of the changes in the mill. Little did I know how interesting they would be.

The November 20, 1994 Washington Post was a very interesting issue. For some strange reason, the unveiling of the "Contract With America" occupied a lot of space in that particular issue. The Post staff explained that it was not unknown to the public in that there were four versions published in the TV Guide from October 22 through October 28. The final form folded 67 separate items into 10 single headings, and was intended to give a clear agenda for next year. Webster defines agenda as a list of things to be done. I have an agenda also and somehow it seems to be continually changing to meet the most pressing issues.

What everyone should remember is that the legislative process takes Senate action as well. Unlike the House, Senate rules do not allow the majority party to ram bills through the legislative process.

The first items on the agenda were those that affect the 104th Congress directly. Congressional reforms to be passed on the 1st day of the 104th Congress are: Require all laws to apply equally to the Congress, cut House committees and staff by 1/3, limit terms of committee chairs, require 3/5 majority vote to pass a tax increase, and to conduct an audit of Congressional spending. Most of these items can be done within the House of Representatives.

Other Headlines In The Same Issue

"President Plots a Course Toward the Political Mainstream" (Ann Deroy - Washington Post Staff Writer). The strategy includes a middle-class tax cut.

"Democrats Flash Yellow Light At President" (Helen Dewar - WP Staff Writer) "Senate Leadership Candidates Daschle and Dodd Want To Be Closer To Policy, Farther Politically" (Ann Deroy). The lead-in paragraph states: Regardless of who wins the close race to lead the diminished band of Senate Democrats in the 104th Congress, President Clinton is already on notice that he cannot automatically count on Democratic support in his battles with the new Republican majority on Capitol Hill (it was announced on 12-5-94 that Daschle won).

Dr. Jack Travis, CPG-7378, forwarded an Associated Press article which ran in the 11-25-94 Milwaukee Sentinel regarding the GOP proposal and attendant budget cuts for 1995. The article also mentioned that the I.C.C., and U.S.G.S. would be eliminated. All of these actions and others were mentioned in the "Contract on America".

As happens only too often, the paper erred in the reference to 1995 spending cuts. Congress has already approved the budget for FY 1995 and is now working on the budget for FY 1996, while the administration is working on the proposal for FY 1997. The whole process is far more complicated than most realize. Both parties are serious in reducing the size of the government. That means cuts. The U.S.G.S., Bureau of Mines, and other agencies are not immune. I emphasize again that it would take an act of Congress to wipe out an agency. If both houses agree, it could happen. Maybe we'd get a Department of Natural Resources instead. Has anyone ever heard that one before?

If you want to make a difference, WRITE YOUR ELECTED REPRESENTATIVE. This is more important now than ever. New Representatives and Senators will be hungry for tech-

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Executive Director's Itinerary
(subject to change)

The Executive Director is visiting various Sections, agencies, campuses, and other organizations. He is talking, listening, and exchanging information and ideas. Members are encouraged to attend these meetings wherever and whenever possible. His itinerary for the next several months, as presently scheduled, is:

<table>
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<th>Date</th>
<th>Location/Event</th>
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<tr>
<td>Jan. 14, 1995</td>
<td>Executive Committee, Arvada, CO (tentative date)</td>
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<tr>
<td>Mar. 5-8</td>
<td>American Assn. of Petr. Geol. Conv., Houston, TX</td>
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<td>[Mar. 5-9]</td>
<td>Headquarters Staff will attend Society for Mining, Met. &amp; Explor., Denver, CO</td>
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<td>Apr. 8</td>
<td>Executive Committee, Arvada, CO</td>
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<td>Apr. 20</td>
<td>Univ. of Arkansas, Fayetteville, AR</td>
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<td>May 4-6 or</td>
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<tr>
<td>May 11-13</td>
<td>Assn. of State Boards of Geology, Orlando, FL</td>
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nical input regarding the geosciences. Get to know their local aides. Get a copy of the new Congressional Yellowbook. It is expensive (about $225), but if you are seriously considering getting active, you should have one. The yellowbook lists members of both houses, background, committee assignments, staffs, committee staffs, key people, Congressional support activities etc. For information regarding orders or new subscriptions call (212) 627-4140.

For new members who may not have read the Executive Director's Column in the July 1990 issue of TPG, I will repeat the system for corresponding with your legislators. This system has worked for many years and was developed through personal contacts with Congressional aides and staffers. Try it, you'll like it.

Your letter should be approximately one and one-half pages. That blank half page at the end is important.

The first paragraph, about one-quarter page, should briefly introduce the subject and your qualifications to comment on it. Limit the letter to one subject and be complete, yet concise and to the point.

The second paragraph should be about one-half page. In it address a few key points. (As few as possible; be highly selective.) Identify the points and briefly discuss each.

The third paragraph should also be about one-half page. Use it to make suggestions. Again, be brief and to the point.

Your fourth paragraph, about one-quarter page, should tell how you may be contacted if more information is needed or if some point needs clarification.

This leaves the last half-page unused. Keep it that way! That is where the staffer who first reads your letter will make notes and comments for later discussion with the legislator or administrator, and perhaps you.

About a week after you mail the letter, follow it up with a telephone call. Was the letter received? Are there any questions? If it has not been read, keep calling at weekly intervals until it is.

If the issue was important enough for you to write about, then it is important enough to follow through. Above all be courteous, brief, and concise.

Since there is little in the way of notable material from the Federal Register this month, I will close with a quote from Robert Byrne. "Everything is in a state of flux, including the status quo."

F. B. "Ted" Mullin, CPG-1716, is currently a Supervisory geologist for the Rocky Mountain Region, United States Forest Service. The Today In Washington column is a monthly feature and has been written by Ted since September, 1991.

***PAST DUE***

Please take a moment to look at the mailing label attached. If you find an asterisk in the corner, it means that Headquarters has not received your dues as of January 1, 1995. AIPG Annual Dues were due on this date. Those Members whose dues are not paid by February 15, 1995, shall be suspended and will not be listed in the 1995 Membership Directory. Be sure you don't miss the deadline!

REMANDER:

THE PROFESSIONAL GEOLOGIST MAGAZINE AND THE ANNUAL MEMBERSHIP DIRECTORY ARE INCLUDED IN YOUR NATIONAL DUES. ADDITIONAL SUBSCRIPTIONS AND EXTRA COPIES OF THE DIRECTORY ARE AVAILABLE TO MEMBERS FOR $15.00 EACH.

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United We Stand, Divided We Fall

(An opinion from a CPG. Members are encouraged to submit opinions or rebuttals.)

COMMENT by Edward G. Miller, CPG-4686

We must unite for Geologist Registration. It is time geologists unite on certain fronts or suffer the consequences. Without nationwide state by state geologist registration we encourage obstacles that take years to overcome.

It sickens me to read controversial articles on the issue of geologist registration. Other professions recognize registration is needed not only to preserve and protect their right to work but also to define standards of practice. Sure it brings control, so what, are we afraid of control or standardization that might be needed in our profession?

Perhaps its time we stopped running down geologist registration and got behind registration like other professions. AIPG could be the organization that represents all professional geologists in all states regarding legislative and regulatory issues affecting our profession. However, it cannot do that effectively with less than 5000 members.

Perhaps it is time we rethink AIPG and its role in supporting geologists. AIPG could be an order of magnitude larger tomorrow if it would do just two things.

First, revisit why AIPG was formed. Read page 4 of your 1994 Membership Directory, “A Brief History of AIPG.” It states AIPG was formed to address public responsibility, regulation, and business practice and also provide national representation. As an aside, we call ourselves Certified Professional Geologists. AIPG was not formed to certify geologists.

AIPG was formed to represent geologists at both the national and state levels. AIPG must focus on this single activity before other groups spring up to fill the void and further splinter our profession. Case in point, a new group in Texas, the Texas Association of Professional Geoscientists (TAPG).

It is great to read articles like that in The Professional Geologist, October 1994 that concludes, "Geologists Are Naturals for Vapor Extraction" by Terrence P. Brennan, CPG-7619. However, did you know that geologists may not be able to practice any geologic services on UST projects in Texas without being under the direction and supervision of a registered engineer. Engineers in Texas are lobbying the State to reclassify remedial UST services, including site characterization, as an engineering service. In Texas that means only an engineer can supervise engineering services and must sign and seal documents relating to engineering services.

Did you know that someone or some group has convinced the Texas State Auditor's office to propose changes to the employment classification system eradicating the professional categories of geologist, hydrogeologist and hydrologist? Those of you in other states where
you don't have to constantly fight just to maintain your professional identity should be very thankful.

So, why did this group, the Texas Association of Professional Geoscientists, form? The answer, AIPG was not looking out for the best interests of geologists in Texas. It's that simple. The direction from the leaders of AIPG is indecisive. Its time for AIPG to revisit its goals and focus on protecting our profession, whether they like it or not, that is their charge.

I have maintained my membership in AIPG since 1980 in hopes that some day AIPG would represent me in the registration process in Texas. It is now doing just that, but almost too late after several years of indecisiveness. TAPG, a small group of only 35 members, has already formed a Political Action Committee and written letters protesting the eradication of the professional categories of geologist, hydrogeologist and hydrologist from the state employee classification system. We have yet to see AIPG do anything so boldly in Texas.

The second thing AIPG should rethink is certification. Perhaps AIPG should require all members to be a Registered Professional Geologist in any state as the primary criteria for membership. As an alternative, in states where registration does not yet exist, continue the present system until registration does exist. And, above all, aggressively encourage and help geologists become registered in all states, then aggressively protect our right to practice our chosen profession.

Perhaps it is time for AIPG to evolve to a higher level. Perhaps AIPG should become more than a small group of geologists that number less than some geological associations that only claim to represent a specific technical group. AIPG should represent ALL geologists. And, ALL geologists need to rethink Geologist Registration.

DIVIDED WE FALL!*

Field Study Reports Low Lead Levels From Submersible Pumps

[DUBLIN, OHIO] 10-6-94 -- Significant levels of lead are probably not leaching into ground water supplies from submersible well pumps operating under typical installation conditions, finds a study recently released by the University of North Carolina - Asheville's Environmental Quality Institute (EQI). The EQI study supports information gathered by the National Ground Water Association from several state agencies that had measured lead levels in active drinking water wells.

The study, guided by the Institute's Dr. Richard P. Maas, "provides substantial clarification of the extent to which new leaded-brass submersible pumps contribute lead to drinking water under typical usage conditions," the report states.

Measurements for lead levels in the water were taken from wells constructed near Asheville specifically for the Institute's study, with one of five brands of submersible well pump installed in each well.

For two of the five brands tested, the study "produced essentially undetectable lead concentrations throughout the study," while the remaining three brands tested had average lead levels at each of eight 5-day intervals readily below the 15 parts per billion (ppb) "action" level for public water distribution systems. There is no national lead in drinking water standard for private wells. The highest average levels for any brand tested by EQI were recorded during the first five days of the field study.

"Naturally," the report states, "much lower lead levels would be expected under actual field usage conditions where the standing water in the pumps could potentially be diluted by water in the well casings and in the above-ground pressure tank prior to entering the residence. Also, it was readily acknowledged that the pumps might 'age' much more rapidly in terms of lead leaching under actual usage conditions where many volumes of water would be pumped through the pump housing as opposed to the once-a-day laboratory water changes."

In January 1994, the Environmental Quality Institute published a laboratory study of lead leaching from submersible pumps commonly used in private wells. The laboratory study, which many ground water industry experts contend was not reflective of actual operating conditions, was funded by the Environmental Defense Fund and the Natural Resources Defense Council.*
CALL FOR PAPERS

The American Institute of Professional Geologists
Oklahoma Section

and

The Oklahoma Geological Survey

are hosting a joint conference on

The Profession of Geology:
(geology as a critical vocation in service to society).

Proposed session topics include:

1. Petroleum Geology (exploration and development)
   and Geophysics
2. Hydrogeology/Contaminant Hydrogeology and
   Environmental Geology/Geologic Hazards
3. Economic Geology (nonmetallic and metallic)
4. Potpourri (engineering geology, forensic
   geology, etc.).

The conference is planned for April 21-23, 1995, at
the Sarkeys Energy Center at the University of Okla-
ahoma, Norman, OK.

Call for Papers. Please submit ABSTRACTS of your
paper by January 30, 1994 to: Skip Honeyman,
Davis Brothers, L.L.C., One Williams Center, Suite
2000, Tulsa, OK 74172.

If your paper is accepted please have a complete copy
ready for submittal for inclusion in the proceedings.

MEMBERS IN THE NEWS

The Geological Society of America (GSA) held its annual meeting in Sea-
ette, Washington, October 22-27, 1994. Geological Investigation geolo-
ist Tom Scott, CPG-4950, and Paulette Bond presented papers at
the meeting. Dr. Scott’s paper, enti-
tled "Reinterpretation of the peninsu-
lar Florida Oligocene: A multidisciplinary view" with Drs. L.
Wingard, L. Edwards and S. Weed-
man of the USGS (Reston) presents
new information on the development
of the Florida Platform during the late
Paleogene. Dr. Scott is also a co-
author on a paper with Tom Mis-
simer, CPG-4549, and others from
the University of Miami entitled "Ce-
nozoic record of global sea level
events in the Hawthorn Group and Tamiami Formation on the Florida
Platform."

Richard Gray, CPG-1257, Senior
Vice President of GAI Consultants,
Monroeville, Pennsylvania, was re-
cently elected national President of
the Association of Engineering
Geologists.

John Parrish, CPG-3326, re-
signed on June 30, 1994 as Execu-
tive Officer of the Board of Registra-
tion for Geologists and
Geophysicists to take a similar
position with the Division of
Mines and Geology. His contri-
butions to our Board were sig-
nificant and we wish him
success.

Walt Schmidt, CPG-6029,
State Geologist and Chief of the
Florida Geological Survey within
the Division of Technical Serv-
ces, was installed as the Presi-
dent-Elect of the Association of
American State Geologists
(AASG) at their annual meeting
held recently in Ohio. The AASG
is an organization of the chief
executives of the state geological
surveys in the 50 states and
Puerto Rico.

AIGP Section
Announcements

The TPG will publish an-
ouncements of major
meetings held by AIGP Sec-
tions. Announcements
should be sent directly to
Wendy Davidson at AIGP
Headquarters. Also, Head-
quarters would like to re-
ceive copies of section
newsletters for pertinent
publishable news. HOW-
EVER, important an-
nouncements should be
sent under separate cover
for individual consideration.
American Institute of Professional Geologists

The Professional GEOLOGIST

RATES & ADVERTISING SPECIFICATIONS FOR MONTHLY MAGAZINE

Published monthly, The Professional Geologist (TPG) contains reports by the President, Executive Director, Committee Chairmen, news from the 36 local sections, and the profession in general, columns, letters, announcements, and brief articles of interest. Issues include a theme and a full color cover (see editorial calendar for themes).

Circulation:  • approximately 6,000

Demographics:  • Professional Geologists
               • Businesses
               • Government Agencies
               • Technical Libraries
               • Related Industry
               • Universities/Colleges

[The Editor of AIPG is authorized to accept or reject any advertising copy submitted for publication.]

GENERAL ADVERTISING RATES

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<td>Back Cover</td>
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ADVERTISING SPACE CONTRACT

American Institute of Professional Geologists (AIPG)
THE PROFESSIONAL GEOLOGIST
7828 Vance Drive, Suite 103
Arvada, CO 80003-2124
(303) 431-0831 • (303) 431-1332 FAX

PUBLICATIONS MANAGER
WENDY J. DAVIDSON

Date: _____________________________

Advertiser: _____________________________ Contact Person: _____________________________

Address: _____________________________

City/State: _____________________________ Zip: _____________________________ Phone: _____________________________

DEADLINE: The 1st of the month preceding publication.

You are hereby requested and authorized to insert the advertising of the Advertiser by the undersigned authorized representative, as follows:

ADVERTISING SPACE:

FREQUENCY: 1x_____ 3x_____ 6x_____ 12x_____ RATE: ___________ SIZE: ___________

CHECK MONTHS OF INSERTION:

DIRECTORY ISSUE: __________________________

(Directory published in April as a separate, thirteenth, issue.)

START: Month __________________, 19 ______ END: Month __________________, 19 ______

TOTAL AMOUNT DUE: __________________________

Advertiser is responsible for notifying advertising representative of any changes regarding this advertising contract as soon as possible. Advertisers must give 60 days notice to cancel cover contracts.

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TERMS AND CONDITIONS:

1. Advertiser agrees to protect and save harmless the American Institute of Professional Geologists and its advertising representative ("Publisher") from any suits for libel, violation of right of privacy, plagiarism, copyright infringement, and any and all other claims in connection with the advertising referred to in this contract and assumes liability for all content of advertisements printed and for any claim arising therefrom made against Publisher.

2. Publisher reserves the right at any time to decline any advertising which it feels to be inappropriate.

3. Advertising is accepted in accordance with the rates, terms and conditions set forth in the current rate card and Advertiser acknowledges receipt of such rate card. Insertions cannot be cancelled after closing date listed in current rate card.

4. Prepayment required to accompany ad for first-time advertisers or at the discretion of the publisher. A fifteen percent discount on space is given to recognized agencies if account is paid within 30 days from date of invoice. No space discounts will be given on ads one-sixth page and smaller. No cash discounts. Publisher reserves the right to hold Advertiser liable for payment due to the Publisher.

5. Only authorized personnel for the Advertiser may execute this contract.

6. Publisher makes every attempt to print and mail by the end of the first week that the magazine is published. However, Publisher does not guarantee date of printing, date of mailing or date of receipt of any issue of The Professional Geologist. Publisher makes every attempt to accommodate position requests but does not guarantee position.

Advertiser: _____________________________ Title: _____________________________

Accepted by: _____________________________ for Publisher.

07/93
AIPG MEMBERSHIP BENEFITS

Certification

AIPG certifies the qualifications of professional geologists prior to admitting them into membership. By means of a rigorous and thorough peer review process, the Institute investigates applicants who voluntarily apply for self-regulation through the Institute. This screening carefully evaluates their education, experience, technical competence, and ethical conduct. If they meet AIPG’s high standards, applicants are granted Certification and the title of "Certified Professional Geologist" (CPG). When the letters CPG follow an individual’s name, they proclaim to the public that this person has met the standards and subscribes to the Institute’s Code of Ethics and Bylaws.

Representation

Members are represented by qualified geological professionals. Congress, Legislatures, and Federal and State agencies are lobbied on specific mining, petroleum, water, environmental and other issues of special interest to geologists.

A portion of AIPG’s monthly magazine The Professional Geologist (TPG) is devoted to reporting developments at all government levels. Thirty-six sections of AIPG provide group representation on a state or regional level and offer opportunities to meet, work and exchange ideas and information with colleagues.

Education

At the national and section level, AIPG provides materials designed to enhance the professional knowledge and skills of its members. Educational opportunities range from seminars and short courses to sectional and national meetings. To encourage high standards of educational programs, the Institute recently established a program of Accreditation of Continuing Education opportunities offered by other organizations.

The Institute prepares and distributes comprehensive publications giving background and scientific explanations on geologically-related matters of public concern. Topics include: ground water, radioactive waste, and hazardous waste.


Insurance

Professional liability, health, and life insurance are available to members.

Information

AIPG disseminates information to its members and to the public in a number of ways on a wide variety of topics. The Institute publishes a monthly magazine The Professional Geologist (TPG). It is mailed to members and interested individuals, businesses, and political leaders. Subscriptions are available to non-members.

A comprehensive Membership Directory is published annually. Copies are sent to federal, state, regional and local governments, libraries, consulting firms, corporations, and other potential users of geologic services throughout the United States and abroad. The Directory may also be purchased by non-members.

---

REQUEST FOR APPLICATION AND ADDITIONAL INFORMATION

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Mail, fax, or call:
AIPG
7828 Vance Drive, Suite 103
Arvada, CO 80003-2125
(303) 431-0831 • FAX (303) 431-1332

Please send me information on:

☐ Certification - (degree and 36 semester hours in a geological science, plus five years of experience).

☐ Candidate for Certification - (degree and 36 semester hours, but less than five years of experience).

☐ Student (major in a geological science and minimum of 18 semester hours in geological science).

☐ Publications ☐ Subscriptions

☐ Advertising Rates ☐ Insignia Items

---

29
NEW MEMBERS

(Welcome and call us professionals and add them to your directory)

NEW STUDENT AFFILIATE

VA - DECKER, Roger E, CFC-0093
249 Dry Branch Road, Churchville, VA 24421, (703)942-1161.

NY - SCHEUNER, David, CFC-0094
R82 Box 1-67, Monroe, NY 10950, (201)338-6680.

KS - BASUKI, Don S., SA-0032
2330 N. Clive St., #214, Wichita, KS (316)391-3148.

AIPG Membership Totals

As of 12/20/93

As of 12/20/94

Active

4,291

4,488

Retired

529

532

Affiliates

65

85

TOTALS

4,885

5,105

WI - ANDERSON-NEGEB, Steven, CPG-9432
1269 Mississippi Drive, La Crosse, WI 54601, (608)747-9200.

IL - ANTONIOAIDES, Constantine, A, CPG-9424
41510 Monterey Lane, Streamwood, IL 60107, (708)571-2162.

NY - ASH, Saul, CPG-6451
144 Franklin Street, New York, NY 11783, (516)676-3320.

MO - BROOKSHIRE, Cynthia, CPG-9433
1200 North Park Street, Springfield, MO 65807, (417)865-4752.

NC - BROWN, Douglas B, CPG-9435
5221 S. U.S. 92, Marietta, GA 30561, (770)427-4848.

OH - CHANDLER, Margaret A, CPG-9435
316 W. Waverly Road, Rocky River, OH 44116, (216)556-6595.

LA - CUMMBS, Bob W., CPG-9435
5505 D McArthur Drive, Baton Rouge, LA 70817-1417, (504)764-2555.

MI - CZEWIAK, Matthew, CPG-9437
2459 West Clipperton Street, Milwaukee, WI 53214, (414)898-1219.

TN - DE CINQUE, James D, CPG-9438
1200 North Park Street, Springfield, MO 65807, (417)865-4752.

MI - DE KUUYER, Mark H., CPG-9426
12000 Country Club Drive, Naples, FL 33910, (216)725-6564.

MI - DYE, Daniel S., CPG-9439
2656 South Terrace, Kalamazoo, MI 49008, (616)663-2144.

VA - GANOE, Brian W., CPG-9453
12025 Brookwood Drive, Chesterfield, VA 23234, (804)287-3162.

CT - GOOD, Robert F., CPG-9454
401 Wesley Road, Towson, MD 21204, (410)766-1207.

WI - GREGG, Alphonse, CPG-9450
1961 W. Mound Street, Chicago, IL 60607, (312)361-9333.

IL - GREGGS, John C., CPG-9455
2917 W. Fullerton Avenue, Chicago, IL 60618, (312)544-5222.

MI - HASSANI, Hosam N., CPG-9456
1227 Forest Avenue, Bloomfield Hills, MI 48013, (313)656-5555.

CA - HUNT, William T., CPG-9457
31941 Ramona Drive, Moreno Valley, CA 92555, (714)688-1091.

CT - HURD, Howard S., CPG-9450
1315 Maple Street, Rocky Hill, CT 06067, (203)379-6899.

NY - LENT, David R., CPG-9441
1100 Overlook Avenue, Brooklyn, NY 11209, (212)333-3500.

NH - MILLENDER, Kenneth W., CPG-9426
1501 31st Street, Denver, CO 80250, (303)274-7500.

IL - MOORE, William F., CPG-9431
3020 N. Main Street, Aurora, CO 80014, (303)274-7500.

MI - NELSON, Barry R., CPG-9433
215 3rd Avenue Northwest, Minneapolis, MN 55401, (612)333-3500.

IL - NOYES, Geoffrey C., CPG-9452
1900 Concordia, St. Louis, MO 63104, (314)934-3500.

MI - PIEPER, Michael P., CPG-9450
P.O. Box 3121, Burlington, WI 53101, (414)333-6544.

WI - ROG, Christopher J., CPG-9444
354 N. Bayview Avenue, Rhinelander, WI 54501, (715)362-3244.

AK - SALTNORTH, Arthur C., CPG-9448
10007 Lee Street, Eagle River, AK 99577, (907)569-7291.

NY - SCHWIMMER, Mark C., CPG-9446
3589 Whitchurch Lane, East Aurora, NY 14052, (716)297-4205.

AZ - SHER, Julianne M., CPG-9428
2644 E. Silverwood Drive, Phoenix, AZ 85048, (602)291-0992.

OH - SKRZYNIECKI, Ronald G., CPG-9427
543 Bragg Drive, Centerville, OH 43034, (513)875-6500.

IL - SMITH, Donald W., CPG-9449
221 West Ann Street, Knoxville, IL 61448, (309)763-2507.

WI - SULLIVAN, Thomas C., CPG-9445
5002 Montclair Lane, Madison, WI 53713, (608)222-8900.

OH - URIAN, Brian A., CPG-9445
P.O. Box 427, Westfield Center, OH 44245, (216)564-5800.

NY - VINCENZ, James C., CPG-9448
3 Mason Court, Loudenville, NY 12211, (518)899-8749.
AMERICAN INSTITUTE of PROFESSIONAL GEOLOGISTS
1995 ANNUAL MEETING:
"Prosperity and Professional Geology"
October 1 - 5, 1995
Hyatt Regency Hotel - Denver, Colorado

Sunday through Thursday, with events on preceding day (Saturday, September 30) and on Thursday - Friday, a 2-day trip to Glenwood Springs/Beaver Creek/Leadville

AIPG
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1995 AIPG ANNUAL MEETING
c/o Conference Associates
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Denver, CO 80203
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Susan M. Landon
790 Ballantine Road
Golden, Colorado 80401
303/436-1930 • FAX: 303/436-1935

Hydrogeology Chairman
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4730 Table Mesa Drive, #1-34
Boulder, Colorado 80303
Phone/FAX: 303/494-8122

Proceedings Editor
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University of Northern Colorado
Greeley, Colorado 80639
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