MAY 2002
Volume 39, Number 5

The Professional GEOLOGIST

ELECTION BALLOT

The June issue will include a ballot for electing the AIPG National Officers.

Only AIPG Members that have the right to vote will receive a ballot in their issue.

PLEASE REMEMBER TO VOTE!

PEER REVIEWED ARTICLE
Delineation of Petroleum Reservoir Boundaries for Unitization in Louisiana

Mineral Property Valuation Standards - A U.S. Perspective

Control Report: End the PE Death March

Rational Science for Rational Policy: The Endangered Species Act and the Law of Unintended Consequences

Utah Legislature Passes Bill to License Geologists

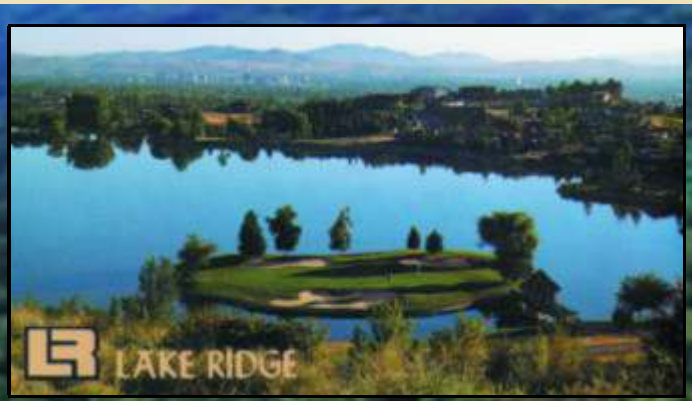
A publication of
The American Institute of Professional Geologists

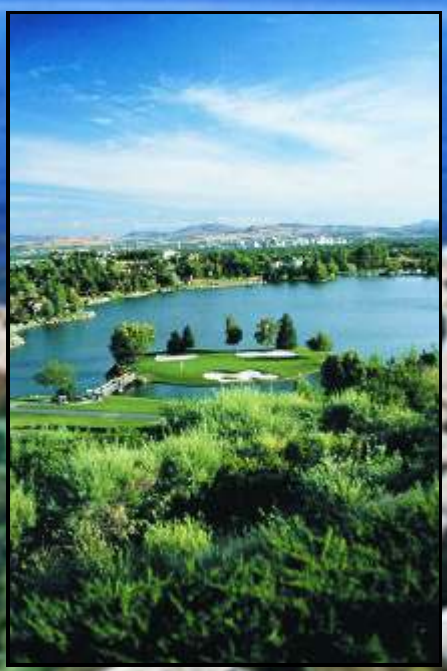
Reno 2002

AIPG • AEG Joint Annual Meeting

September 23-29

The 2nd Joint AIPG • AEG 2002 Annual Meeting being held in Reno in September will feature two special events that AIPG members may wish to participate in. Both events are sponsored by AIPG solicited corporations and both events have limited space. The purpose of this notice is to give those AIPG members who will be attending the meeting in Reno the opportunity to sign up for either event prior to receiving the official registration form.





The concept for the golf tournament is that 5 four member teams each from AIPG and AEG will tee off at 1:00 P.M. on September 24, 2002. Lakeridge Golf Course is 10 minutes by car from the Peppermill Hotel. The course is designed by Robert Trent Jones and the 15th hole, pictured above, is the signature hole. In addition to the golf cart and on course refreshments, there will be prizes for low net, most lost balls and other fun categories. The format will be best ball scramble with handicaps submitted by the players.

Please contact Kel Buchanan by fax or e-mail if you are interested in playing in the golf tournament. I will need your handicap or USGA index if you have one. For golfers who just like to swing away, the handicap is 40. My contact numbers are listed in TPG under the AIPG Foundation. The cost for the golf tournament is $45 thanks to our sponsor, Eklund Drilling, but don't send any money until you register; just notify me of your interest so I can put you on the list.

The Dinner Cruise on Lake Tahoe: On September 26, four buses will leave the Peppermill Hotel at 4:30 P.M. for a very scenic mountain journey, arriving at the MS Dixie pier at 6:00 P.M. The MS Dixie is a new, fast paddle wheeler, (pictured above), one of two paddle sheelers which travel Lake Tahoe in the summer. The AIPG•AEG dinner is a private event. The MS Dixie has a live band on board for your enjoyment and the lake is a sheet of glass in the evening. The number of guests is limited to 180 persons. Because this cruise is such a good value thanks to our sponsor Mungas Construction, I expect it will have a waiting list. Since this sponsor was solicited by AIPG, I would prefer that those ont he waiting list not be AIPG members. The cost of the dinner cruise is $45 and, as with the golf tournament, please just notify me of the names of the participants for the priority list.

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FRONT COVER—Granite Dells near Prescott, Arizona. Photograph by Larry D. Fellows, CPG-04447.

Delineation of Petroleum Reservoir Boundaries for Unitization in Louisiana: An Overview of Practices and Trends

Madhurendu B. Kumar, Ph.D., R.P.G., CPG-03106

A drilling and production unit for a petroleum reservoir is the maximum area representing a portion or entirety of the reservoir that can be drained efficiently and economically by one well. Unitization is the process of integrating separately-owned tracts of land, mineral leases, and other property interests overlying the reservoir for joint development or production of the reservoir. Unitization allows a maximal recovery of hydrocarbons (oil and gas or gas and condensate) from a reservoir, prevention of the drilling of unnecessary wells and protection of the correlative rights of the mineral owners. Additionally, unitization provides the basis for the distribution of the proceeds of producing wells and well costs, and avoidance of lease rentals and expirations. A drilling and production unit formed for the exploration for and production of hydrocarbons can be any one of the following types: Declared Unit (based on the pooling provision of the lease concerned), Voluntary Unit (predicated on a voluntary agreement of all parties with an interest in the unit), Single Well Conservation Unit (resulting from public hearing held by the Louisiana Office of Conservation), Reservoir wide (multi-well) Unit (established by the Louisiana Office of Conservation, encompassing the entirety of the reservoir based on at least 75% of the working interest ownership and 75% of the mineral ownership), and Deep Well Unit (multi-well unit covering the reservoir below 15,000 ft, established by the Louisiana Office of Conservation). Any well drilled and completed as a gas or oil producer may be operated on a lease basis or has to have a unit (of any of these types) that the well will drain. The details of the procedure for establishing the various types of units are outside the scope of this article, but are addressed by Harrison (1976), Sabate (1991), and Pritchard (1991). This report focuses on the delineation of unit boundaries.

A drilling and production unit may be geographic or geologic, depending upon the nature of its boundaries. A geographic unit is characterized by arbitrary boundaries that may reflect property lines, lease boundaries, government section lines, roads, or some major geological features, such as surface shore lines, river banks, subsurface fault lines, permeability barriers, etc. Geographic units represent a norm for the petroleum fields of North Louisiana. The unit size varies widely depending on the portions of government section, precedent for the field or producing horizon, depth of well and/or cost of drilling and completion. Gas units are normally larger than oil units, normally ranging from 40 to 640 acres.

Geologic units are most common in South Louisiana, although geographic units do exist. Generally, geographic units are formed when available well controls are not adequate to define the productive limit of the reservoir or the geology (specially in salt dome fields) is too complex for geologic mapping, making it impossible to ascertain geologic boundaries of units. In some fields, initially geographic units were established, and subsequently as more well controls become available, they have been revised to form geologic units. Important factors that control the size of a geologic unit are geology, productive area, lease position, precedent in a field, producing horizon or trend, and economics.

Adopted unit geology is important for the purpose of unitization. It is the geology which constitutes the basis for the unit adopted by the Louisiana Office of Conservation. "Adopted geology" includes definition of producing horizon (sand or zone/reservoir), subsurface elevations of the horizon penetrated in the wells, depths and throws of faults, dip and strike of the horizon and faults, and down-dip productive limit. For unitization purposes, the data previously used in unit determinations are not allowed to be re-interpreted in order to honor the adopted geology. However, in the event new well controls clearly warrant a revision of the adopted geology, the latter is revised with a minimal change in the unit boundaries. Obviously, unitization geology is distinctly different from exploration geology. Unitization geology must honor all available data, while exploration geology may reflect the personally novel creative approach or geologic philosophy of the exploration geologist, who may completely ignore the previously interpreted geology.

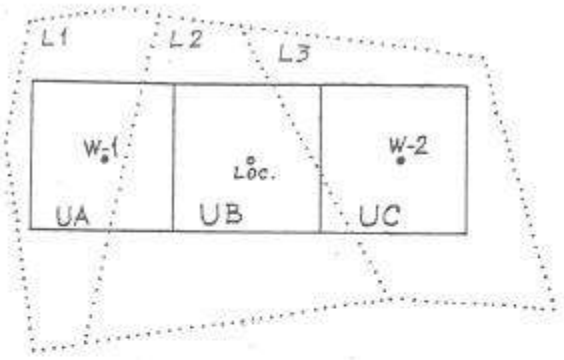

FIGURE 1. GEOGRAPHIC UNITS
(FIRST YEAR)

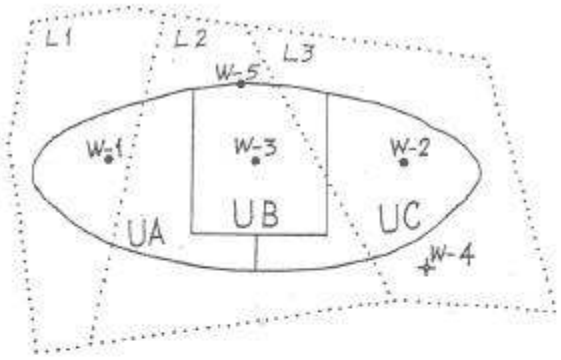

FIGURE 2. GEOLOGIC UNITS
(SECOND YEAR)

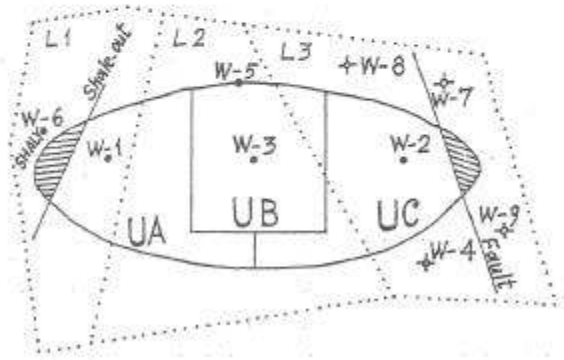

FIGURE 3. REVISED GEOLOGIC UNITS
(THIRD YEAR)

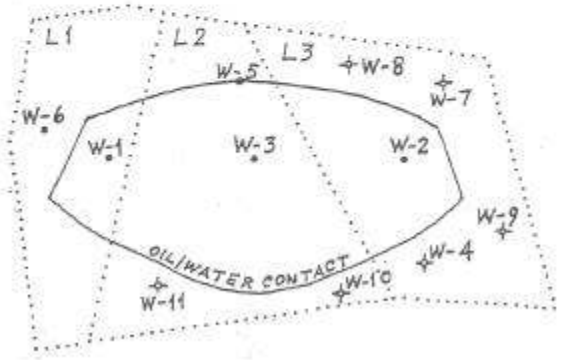

FIGURE 4. RESERVOIRWIDE UNIT
(FOURTH YEAR)

The boundaries of a geological unit may be predicated on one or more geological features, such as subsurface fault traces, oil/water (O/W) or gas/water (G/W) contacts, spill points, sand pinch-out or shale-out, or permeability barrier, which is recognized essentially based on the anomalous production characteristics of wells. In case no fluid (O/W or G/W) contact is observed in any of the wells drilled into the reservoir, an "Assumed Productive Limit" (APL) is utilized as one of the unit boundaries. An APL may be predicated on the highest known water level (HKW) or the lowest known hydrocarbons level (LKH) encountered in an adjacent well or an arbitrary level mid-way between the HKW and the LKH, or an assumed down-dip extension of the proven hydrocarbon column or productive sand thickness, depending upon the structural configuration of the reservoir. One sand thickness below the LKH may be used in an area of low structural dip ; more sand thicknesses below the LKH may be used in a steeply dipping area, such as salt dome fields. APL placement also can be influenced by structural position of the unit well, thickness of productive horizon (sand/zone), lease position and well spacing or resulting unit size.

Whenever a new well is drilled, its potential impact on the boundaries of the unit concerned is evaluated by the unit operator or party concerned. If a change in the previously adopted unit geology is warranted, unit boundaries are revised through a due process. As additional wells are drilled, the pattern or configuration of units may change. A trend of such changes is illustrated in Figures 1 through 4, which depict the progressive development of a hypothetical petroleum field composed of one reservoir in South Louisiana. In this field there are three leases, namely, L1, L2 and L3, denoted by dotted lines. The field has been developed and produced over a period of four years. The first year status of the field is shown in Figure 1 with two successful wells (W-1 and W-2) drilled 2 mi apart and three Conservation geographic units (UA, UB and UC) of identical size and shape established; the unit UB was not yet drilled. In the second year, as shown in Figure 2, W-3 was successfully drilled and completed to drain the unit UB, while W-1 and W-2 continued producing from units UA and UC. Additionally, W-4 and W-5 were drilled, which helped to establish the O/W contact of the reservoir. On the basis of the structure contour mapping of the reservoir, its productive limit was delineated as shown. The geographic units UA, UB and UC created previously were dissolved and new revised geologic (Conservation) units were simultaneously created, which differ significantly in shape and size from the previous geographic units. Figure 3 shows that in the third year, four new wells (W-6 through W-9) were drilled. These two wells established a shale-out boundary of the reservoir to the west, and a fault boundary to the east , resulting in the deletion of some non-productive acreage from units UA and UC. Finally, during the fourth year, as indicated in Figure 4, additional wells

(W-10 and W-11) were drilled to the south. Based on the revised structure map of the reservoir, its southern boundary extended southward to include some additional productive acreage. Subsequently, an enhanced recovery project was initiated for the field. To this end, the previous three units UA through UC were dissolved and simultaneously a reservoir wide (Conservation) unit was established to facilitate hydrocarbon production from multiple wells. As a result of the changes that occurred in the unit configuration during the course of the progressive development of the field, the equity or participation percentage of each interest owner in the production has significantly changed. In reality, the Irene and Port Hudson Fields in South Louisiana have similar histories of unitization.

More often than not, it is a significant professional challenge to determine the unit boundaries. It is more so, when multiple separately-owned tracts of land are to be included within a unit, since the unit boundaries determine the relative equities of each individual or party concerned. Historically, unitization has precipitated highly contested hearings, lasting over extended periods of time. Records of all of these activities are maintained in the Office of Conservation in Baton Rouge. Information pertaining to past and future unitization hearings also may be obtained from this office.

LITERATURE CITED

Harrison, F. W., 1976, I've Got A New Producer in South Louisiana - Now What? Transactions of the Gulf Coast Association of Geological Societies, v. 26, p. 125-127.

Sabate, R. W., 1991, Oil & Gas Law for the Louisiana Geologist: Introduction to Central Gulf Coast Geology, p. 211-216.

Pritchard, III, W. E., 1991, Gulf Coast Oil and Gas Board Hearings: Credibility of Geological Expert Witnesses: Transactions of the Gulf Coast Association of Geological Societies, v. 41, p. 542-554.

Dr. Kumar has been serving as Geologist Supervisor with the Louisiana Office of Conservation for over 19 years. He has attended numerous Conservation Public Hearings, conducted and supervised geologic evaluations and delineation of petroleum reservoir boundaries, and prepared thousands of Conservation Orders and made recommendations to the Commissioner of Conservation on hundreds of contested cases of unitization, often with State Exhibits. He has published over forty technical reports pertaining to petroleum geology, salt domes, and computer applications.

The author gratefully acknowledges the comments of Frank W. Harrison, Jr., CPG-02500, who reviewed the original manuscript.

Peer Reviewed by AIPG Associate Editors: John L. Berry, CPG-04032, Gretchen M. Gillis, CPG-09693, and John F. White, CPG-04632.

RESOURCE ASSESSMENT FOR JACK MORROW HILLS

The Wyoming State Geological Survey (WSGS) has released an assessment of oil and gas resources for the Jack Morrow Hills area in southwestern Wyoming. According to the new report, this area has high potential for oil and gas resources, with the possibility that under current technology, some 3.9 trillion cubic feet (TCF) of natural gas and 535 thousand barrels of oil could be discovered and developed. Using a natural gas price of $2.50 per thousand cubic feet (MCF) and an oil price of $22.50 per barrel, this resource, if produced, could generate revenues to the State of Wyoming and the affected counties (Sweetwater and Fremont) of approximately $1.88 billion.

Entitled oil and gas resource assessment of the Jack Morrow Hills and surrounding areas, southwestern Wyoming, by L. Cook, R.H. De Bruin, C.S. Boyd, and R.W. Jones, the report is Wyoming State Geological Survey Open File Report 2002-1. The report contains a 25-page text, 15 figures (including three oversized, color map sheets), and four tables. The report sells for $25.00 and is available over-the-counter at the Survey's office in Laramie, by phone order, or by e-mail (sales@wsgs.uwyo.edu). Add $3.00 for shipping and handling; Wyoming addresses add 6% sales tax. For more information contact Rod De Bruin at ext. 226.

The assessment covers the area addressed in the June, 2000 Draft Environmental Impact Statement (DEIS) - Jack Morrow Hills Coordinated Activity Plan prepared by the U.S. Bureau of Land Management (BLM), which includes 574,800 acres of federal land and 51,134 acres of state land. The BLM is in the process of revising the draft version of that document, and the WSGS report was prepared to furnish information on the area's hydrocarbon potential.

Using public and industry sources, the WSGS analyzed data for an even larger area surrounding the Jack Morrow Hills. These data included published information on the regional geology (including the structure, stratigraphy, and geologic history), more specific geologic information (including seismic lines, cross sections constructed from geophysical logs of drill holes, and oil and gas "shows"), and information from known oil and gas fields in Wyoming thought to be analogs for occurrences in the Jack Morrow Hills.

For estimating the area's resource potential, WSGS used the oil and gas "play" concept to develop parameters for hydrocarbon occurrences, first identifying in-place ("unrisked") resources and then discounting these by applying risk factors known for each play. The WSGS also estimated additional oil and gas resources that might be produced from the area in the future, assuming technology in exploration, production, and other disciplines will advance. The additional resources that might be discovered and produced include 9.2 TCF of natural gas and 305,000 barrels of oil, returning revenues to the State of Wyoming and the affected counties estimated at $4.41 billion.

Wyoming State Geological Survey
Release date: 3/27/02
Lance Cook, State Geologist
Wyoming State Geological Survey
(307) 766-2286
http://wsgsweb.uwyo.edu

Mineral Property Valuation Standards - A U.S. Perspective

Marching with the International Valuation and International Financial Reporting Standards

Trevor R. Ellis, CPG-06740

South African Institute of Mining and Metallurgy's Valuation Code Colloquium.
The Valuation of Mineral Projects and Properties: an African Perspective
Randburg, 19-20 March 2002

SUMMARY

The author opposes the presently developing movement of national minerals institutes, such as SAIMM, towards drafting comprehensive standards for mineral property valuation following the model of the development of the Reserve-Resource reporting standards. He has campaigned against such undertakings proposed for U.S. minerals institutes such as AIMA and SME. Unlike Reserve-Resource estimation, few valuation issues are unique to the minerals industry.

The *International Valuation Standards* (IVS) of the International Valuation Standards Committee (IVSC) have achieved a high level of acceptance in the developed and lesser developed countries of the world since release of the 2000 edition. IVS provides a comprehensive framework of Generally Accepted Valuation Principles for the Valuation profession internationally, for valuation of all property or asset types, including real property, personal property, businesses and financial interests. IVSC is effectively a sister organisation to the International Accounting Standards Board (IASB). The *International Accounting Standards* (IAS) references and quotes IVS in some instructions for determination of Fair Value. IVSC is a Non-Governmental Organisation (NGO) member of the United Nations and maintains liaison with many important international economic, accounting and financial agencies, such as the OECD, IMF and WTO.

In February 2001, IVSC convened an Extractive Industries Task Force to respond to minerals and petroleum valuation issues raised during the planned development of an International Accounting Standard for the extractive industries. The author led the task force in developing IVSC's initial input to the IASB. IVSC has proposed reconvening the Extractive Industries Task Force in 2002 to rapidly draft a mining and petroleum section for inclusion in IVS, with particular attention given to addressing IASB concerns. The Task Force will likely expand its membership, and draw from the principles included in The AusIMM's VALMIN Code and the Canadian CIMVal Standard now being finalised.

IVSC hopes to have the draft extractive industries section ready by the end of 2002 for distribution in the next edition of IVS as an Exposure Draft for public comment. The section will be concise, since it will be a supplement to the existing valuation framework supplied by IVS, addressing only the essential elements that are specific to minerals and petroleum valuation. The author proposes that the Council of Mining and Metallurgical Institutions (CMMI) then consider developing supplementary guidance and qualifications requirements, with that document incorporating IVS by reference. The mining institutes of individual countries should then adopt IVS and CMMI's supplementary document by reference. They could supplement those with their own document containing guidance unique to their country's situation, and incorporate their own binding instructions and enforcement provisions.

This paper provides the author's preliminary suggestions of how extractive industries guidance should be incorporated into the IVS. It concludes by recommending that SAIMM avoid the difficult, lengthy and contentious process of developing its own valuation code, and instead adopt the IVS and put its full support behind IVSC's development of an extractive industries section for the IVS. It can then adopt a standard that will have the highest level of international recognition and distribution.

INTRODUCTION

Since 1990, the world has made large advances in globalization of trade and financial services. This has been aided by enhancing the General Agreement on Tariffs and Trade (GATT) and implementation of the 1994 General Agreement on Trade in Services (GATS) by the World Trade Organisation (WTO). Such globalization is driving the development and implementation of globally uniform corporate accounting and financial reporting standards. It also is driving the development and implementation of globally uniform valuation standards for all asset types.[1] Uniformity of rules and standards is being demanded by corporations, governments and securities exchanges.

Standards development initiatives for the extractive industries (mining and petroleum) are already being undertaken by the International Accounting Standards Board (IASB) and the International Valuation Standards Committee (IVSC), both based in London. IASB has an Extractive Industries Steering Committee in place that is preparing to draft a financial reporting standard for the extractive industries for inclusion in the International Financial Reporting Standards (IFRS) as a relatively high-priority project. In cooperation with the IASB and largely to support the planned extractive industries financial reporting standard, the IVSC's Extractive Industries Task Force will draft an extractive industries section for inclusion in the International Valuation Standards. Dependent on receiving necessary input from IASB, the IVSC is seeking to have a draft ready for publication by the 2002 year end.

In light of this, the author recommends that national mining institutes should cease their drive to develop national mineral valuation standards.[2] It is time to move forward and work in the global context. We have benefitted greatly from the efforts of members of The Australasian Institute of Mining and Metallurgy (AusIMM) who have worked on the development and growth of the VALMIN Code since 1989, especially the efforts of Michael Lawrence (AusIMM, 1998). Since 1999, we also have greatly benefitted from the efforts of members of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) who have contributed to the development of the Draft CIMVal Standards published February 2002, and the final standards to be published in May (CIM, 2002). The VALMIN Code and CIMVal Standards have developed from extensive research and considerable thought in formulation. These are two excellent sources to draw upon during drafting of the extractive industries addition to the IVS. The CIMVal Standards will be a particularly useful source since this set is the newer generation and has been developed with its framework, concepts and definitions largely consistent with IVS. "CIMVal intends to be consistent with the general thrust of (IVSC's) work such that, if and when the IVSC's standards are adopted globally in the future, the CIMVal Standards will be readily adaptable." (CIM, 2002, p6). The author commends the CIMVal Committee for this.

It is important that the valuation procedures and reporting requirements for all types of mineral asset valuation mesh with those generally accepted by the global financial community. The best way to achieve this is for our mineral valuation rules and guidelines to be interwoven in the same IVS book with which the global financial community is familiar and looks to as the set of standards for valuation of all types of property and assets in all settings.

The author recommends that South Africa not undertake development of its own mineral valuation standards. Instead it should put its support behind the international initiatives already in place through the IVSC and in conjunction with the IASB. The author has proposed that supplemental guidance of an international nature on minerals valuation and competent person qualifications be provided by the Council of Mining and Metallurgical Institutions (CMMI). National mining institutes and regulatory bodies should adopt IVS and the CMMI's supplemental guidance, and be responsible for enforcement. Guidance on the application of IVS under national regulations and requirements should then be developed by national mining institutes or regulatory bodies.

Immediate adoption of the IVS by SAIMM would provide a useful set of standards for its members through the period of concern to 30 September 2003, despite its lack of specific extractive industries guidance as yet. IVS provides the more important valuation framework based on the Generally Accepted Valuation Principles that represent accepted best practice globally in the Valuation Profession (IVSC, 2001, p16).

IASC AND INTERNATIONAL ACCOUNTING STANDARDS DEVELOPMENT

The International Accounting Standards Committee (IASC), the predecessor of IASB, was formed in 1973 and headquartered in London. Its objective was "*harmonising the accounting principles which are used by businesses and other organisations for financial reporting around the world.*" Harmonisation would allow companies to provide financial reports to securities exchanges in a number of countries with-

1. In the U.S., the term *appraisal* is used for a *valuation* assignment and a formal *Valuation* report. A *valuation* under U.S. usage is typically a less stringent undertaking than an *appraisal*, especially when Real Property is involved. Similarly, a professional *valuer* or *valuator* is called an *appraiser* in the U.S. For the South African audience, valuation and valuer are generally substituted for the U.S. equivalent terms throughout this paper.
2. The South African minerals industry is confronted by a special situation related to the requirement for valuations for capital gains tax purposes to be carried out by 30 September 2003. It would be very difficult for SAIMM to quickly adopt any standard that requires modification, in time to provide a useful time span of governance of its members prior to that date. Therefore, the author recommends that SAIMM give serious consideration to immediate adoption of the IVSC's International Valuation Standards. Quick modification and adoption of the recently released Canadian Draft CIMVal Standards also might be attempted, and if successful could be used as a supplement to IVS (CIM, 2002).

out modification due to variation in accounting rules. Harmonisation meant that countries could adopt the IAS developed by IASC, or modify their existing standards to include the same accounting principles.

By the time IASB took over the IASC's role at the end of 2000, its membership consisted of 153 professional accounting bodies in 112 countries. Though much of its management and standards development work was done on a volunteer basis, it was quite successful and well respected internationally. IASC developed close relationships with all major international financial and economic bodies.

Although the U.S. has been among the slowest countries in progressing with harmonisation, largely due to the scale and complexity of its economy, it has been one of the strongest supporters of IASC and its goals. From 1983, the U.S. Securities and Exchange Commission (SEC) was having formal meetings with IASC. In 1988 the U.S. Financial Accounting Standards Board (FASB) joined the IASC's consultative group in a supporting role. The U.S. Congress passed the National Capital Markets Efficiency Act in 1996, which contains paragraphs encouraging rapid establishment of high quality international accounting standards and requiring the SEC to report to it on progress made towards allowing unadjusted IAS-based financial disclosures (Section 509). Many high level U.S. regulatory personnel on their retirement took positions in IASC and now IASB. An example is Paul Volcker, former Chairman, Board of Governors, U.S. Federal Reserve Bank, who is now Chairman of the IASC Foundation, and another example is the former Chairman of the SEC, Arthur Levitts.

In 1987, IASC published its first bound volume of International Accounting Standards (IAS). In the same year, the International Organization of Securities Commissions (IOSCO) joined the IASC's consultative group in a supporting role. In 1998, IASC completed the major components of the core set of Standards, as identified in an agreement with IOSCO in July 1995. The core standards provide a comprehensive basis of accounting, covering all the major areas of importance to general businesses. They will result in transparency and comparability and they provide for full disclosure.

In May 2000, IOSCO recommended that its members endorse the use of IAS by companies with cross-border offerings and listings. However, the extractive industries and some other economic sectors were excluded from this approval, because they have specialized reporting practices falling outside of the scope of the 30 standards approved by IOSCO resulting from the IAS core standards work program.

Many countries have already adopted IAS as their own, some with minor changes. Some others, such as Australia, have been modifying their standards to match or harmonise with IAS. In June 2000, the European Commission announced that all European Union companies listed on the securities markets should prepare their accounts using IAS by 2005, and is considering advancing that deadline. Although U.S., Canada and Japan are the slowest to adopt IAS, that adoption is accelerating rapidly. The U.S. and Canada have been working under a policy of first attempting to rapidly converge their Generally Accepted Accounting Principles (GAAP) systems of accounting to effectively merge into one system, then modifying GAAP to harmonise with IAS. The timescale for completion appears to remain a few years. The Canadian Securities Administrators (CSA), based on responses it received to a March 2001 discussion paper, is giving serious consideration to abandoning the GAAP convergence project with the U.S., to accelerate adoption of the IAS accounting principles (CSA, 2001). South Africa has modified its GAAP system to allow South African companies to provide IAS compliant reports, but foreign IAS reports are not yet accepted without adjustment to GAAP.

IASB AND INTERNATIONAL FINANCIAL REPORTING STANDARDS DEVELOPMENT

In December 2000 to March 2001, IASC physically underwent a major restructuring, and the IASC organisation was dissolved and replaced by IASB. A determination had been made by IASC in cooperation with governments and the international financial community that the time had come to transition the primary focus from IAS development to global implementation. The SEC and FASB heavily influenced the determination and its outcome (Volcker, 2002). The volunteer board has been replaced by a paid board of primarily full time members, with heavy U.S. and European representation. This new organisation, IASB, relies largely on government rather than private funding. The U.S. will be funding a substantial portion of the IASB's expanded annual budget of approximately £15 million (approximately $20 million).

The IASB's statement of objectives is:

> *The Board is committed to developing, in the public interest, a single set of high quality, understandable and enforceable global accounting standards that require transparent and comparable information in general purpose financial statements. In addition, the Board cooperates with national accounting standard setters to achieve* ***convergence*** *in accounting standards around the world.* (Emphasis added)

The goal of "convergence" in replacing that of "harmonisation" of accounting standards around the world has resulted in the IASB starting the development of a new set of standards. Sir David Tweedie, Chairman, IASB, in describing the goal for the new International Financial Reporting Standards (IFRS), said, 'we plan to build a set of financial reporting standards that are the "gold standard"' (Tweedie, 2002). The ultimate goal is to have only one high quality set of accounting standards used globally in private sector financial reporting, these being the IFRS.

The convergence process in developing the IFRS is being conducted by representatives of the financially advanced countries of the world working directly together, these being from France, Germany, United Kingdom, Japan, Canada, United States and Australia. The process involves reviewing existing national standards and IAS rule by rule to select the best rules for inclusion in IFRS. The spectacular imploding and bankruptcy in late 2001 of the $60+ billion Enron Corporation, and some other recent major financial reporting disasters in the U.S. and Europe have added emphasis to the importance of the convergence process. The Extractive Industries Standard when completed will be an IFRS.

Current Value Reporting

The reporting of the value of assets is one of the areas of most important difference between the IFRS and the older style GAAP systems of accounting still employed in the U.S. and Canada. GAAP dictates reporting of asset value based on their historic cost. Each year the value of the asset is adjusted downward by depreciation, amortization or depletion. Addition of asset value to the accounts requires that an expenditure be capitalized. GAAP can provide accuracy to the cent in reporting to shareholders the depreciated value of a high rise New York or Toronto office building that a company has held for 20 years. It is an extremely precise accounting system. But, GAAP's accuracy is horrible. While the value of the office building is now reported in the accounts to stockholders at less than half its purchase price, the building's market value may have increased 5-fold. With a 10-fold inaccuracy in the value reported, the company is a takeover target. IFRS solves this serious problem by allowing current value *(fair value*) reporting for assets in the primary financial accounts of companies. Many companies in Europe that have adopted IFRS obtain fresh valuations of their major assets, particularly real estate, every two or three years. Those current asset values are entered into the accounts, then depreciation and amortization begin again.

IFRS allows companies to retain historic cost accounting if they prefer. However, once companies adjust their accounting systems to IFRS, it will in general benefit them to move to current value reporting for assets. In addition to providing the shareholder and financial community with a much more accurate statement of company assets, it will generally benefit companies by reporting much higher values for their appreciated assets. This will tend to elevate the price of their shares and aid fund raising.

We hope that the proposed Extractive Industries IFRS will provide similar current value reporting opportunities for mineral and petroleum deposits. However, the tentative views expressed in the IASC's Extractive Industries Issues Paper published in November 2000, and the content of responding submissions, provide cause for concern as discussed below (IASC, 2000).

IVSC AND INTERNATIONAL VALUATION STANDARDS DEVELOPMENT

The International Valuation Standards Committee also is based in London. It was founded in Melbourne, Australia in 1981. The objectives of IVSC are stated as follows:

> *The principal IVSC objective is to formulate and publish, in the public interest, valuation Standards and procedural guidance for the valuation of assets for use in financial statements, and to promote their worldwide acceptance and observance.*
>
> *The second objective is to harmonize Standards among the world's states, and to make disclosures of differences in standards statements and/or applications of Standards as they occur.*
>
> *It is a particular goal of IVSC that international valuation Standards be recognised in statements of international accounting and other reporting standards, and that Valuers recognise what is needed from them under the standards of other professional disciplines.* (IVSC's website www.ivsc.org)

From the perspective of the application of the IFRS, IVSC can be viewed as an important small sister to IASB. IVSC is developing the standards for valuation of assets that are reported at *fair (market) value* under IFRS. The Investment Property Standard recently released by IASB, references and quotes from IVS in its instructions for determination of *fair value*. However, the intended applications for the IVSC standards cover the broader spectrum of uses for formal valuations.

IVSC published the first edition of the IVS in 1985. By the 1997 edition a useful core set of standards was available, and the IVS was now recognised throughout the world and had already been incorporated into the domestic Standards of many nations. In recent years the pace of development has accelerated. The 2001 edition, which the author estimated as being approximately three times the size of the 1997 edition, is a very comprehensive, well organised, 458 page book (IVSC, 2001a). It is written in a relatively easy to read style, considering the nature of its content. The 2000 edition is available in a number of languages, as will be the 2002 edition. It contains guidelines for valuation of the four generally recognised Property Types (categories of assets), these being Real Property, Personal Property, Businesses, and Financial Interests (Intangible Property). It also includes a Code of Ethics and Competency Provisions for the Valuer, though IVSC and IASB have no enforcement mechanism of their own (Ellis, 2001). Ten Guidance Notes sections address specific valuation topics, and work is in progress towards developing additional sections.

The development of the International Valuation Standards (IVS) has been guided by three principal objectives:

> *To facilitate cross-border transactions and contribute to the viability of international property markets by promoting transparency in financial reporting as well as the reliability of valuations performed to secure loans and mortgages, for transactions involving transfers of ownership, and for settlements in litigation or tax matters;*
>
> *To serve as a professional benchmark, or beacon, for Valuers around the world, thereby enabling them to respond to the demands of international property markets for reliable valuations and to meet the financial reporting requirements of the global business community; and*
>
> *To provide Standards of valuation and financial reporting that meet the needs of emerging and newly industrialised countries*. (IVSC, 2001, p. 15).

National valuation associations from 35 countries maintain full IVSC membership, and another 11 countries have observer status representation. IVSC is a Non-Governmental Organisation member of the United Nations, and like IASB works closely with many influential international bodies, such as the World Bank, the Organisation of Economic Cooperation and Development, the International Monetary Fund and the World Trade Organisation.

IVSC's EXTRACTIVE INDUSTRIES INITIATIVE TO ASSIST IASB's PROJECT

IASC Extractive Industries Issues Paper

The IASC in April 1998 appointed a 12 person Extractive Industries Steering Committee to investigate the development of one or more accounting standards for use by mining and petroleum industry enterprises. Development of the Extractive Industries Accounting Standard(s) is occurring at the specific request of the International Organization of Securities Commissions. After 30 months of research, in November 2000 the Steering Committee released a 412 page Issues Paper containing a wide variety of discussion to consider and about 100 questions (IASC, 2000). Submissions in response were sought by 30 June 2001.

The author found that the tentative views expressed by the Steering Committee have a disconcerting *deja vu* resemblance to the U.S. Securities and Exchange Commission's perspective expressed in its highly restrictive *Industry Guide 7* (SEC, 1992). The Steering Committee's tentative recommendation is that primary accounts of extractive industries companies must be reported on an historic cost basis only. Disclosure of the current value of Reserves would be restricted to a supplemental information section and likely be based on a specified method for calculation of a pseudo value as is done now for U.S. petroleum industry reporting. The question of whether to allow quantitative reporting of Resources that are not Reserves, as supplemental information, was only barely included, despite this being an item of great importance for the mining industry. The possibility of reporting an estimate of the current value of any category of such Resources was not included (Ellis, 2001a-b).

If the Extractive Industries Accounting Standard is finalized with this perspective, the restriction to an historic cost accounting basis for Reserves and Resources will greatly handicap the financial abilities of the mining and petroleum industries relative to all other industries that will be allowed current value accounting of their assets (Ellis, 2001b). Research reviewed in the Issues Paper, partially based on the Australian experience, shows that investors react very favorably to current value reporting of reserves in the primary financial accounts of extractive industries corporations, resulting in "a significant effect on the value that the market places on an enterprise's shares" compared to disclosure of the current values in the supplemental information.

IVSC's Extractive Industries Submission to IASB

In late January 2001, the author was contacted by the IVSC to assist it in developing its response to the Issues Paper. Due the long, close relationship with the IASB, the IVSC's input can be expected to receive careful consideration. An IVSC representative has often been appointed to IASC committees that develop standards.

With the author's assistance, the following volunteer Task Force of independent expert minerals valuers was quickly assembled:

Trevor Ellis as the U.S. representative and Task Force leader. President, American Institute of Minerals Appraisers.

Michael Lawrence as the Australasian representative. Chairman, AusIMM's VALMIN Code Committee.

William Roscoe as the Canadian representative (Ross Lawrence, alternate). Co-Chair, CIM's Special Committee on Valuation.

Roger Sawyers as the U.K. representative. Chartered member, Royal Institute of Chartered Surveyors.

Raymond Westwood, Retired Valuer-General, Tasmania, Australia, provided enormous assistance and advice as Technical Editor, having a strong knowledge of the applications and interaction of IVS and IAS.

The response document drafted by the Task Force addressed issues pertaining to the nature of mineral deposits and their valuation. It did not respond to questions about some of the more esoteric areas of accounting. The response document was submitted by the IVSC to the IASB in June 2001 (IVSC, 2001b). Through this, the Task Force hopes to influence the IASB Steering Committee to modify the outcome to an appropriate current value accounting standard for the extractive industries, based on an international minerals valuation standard.

The IVSC has allocated some financial sponsorship for international travel expenses to the Task Force to assist it in composing on a timely basis an Extractive Industries addition to IVS, and for providing additional support to the IASB as may be requested. IVSC is seeking minerals and petroleum industry financial support to provide the Task Force with additional sponsorship for this very time consuming undertaking (but no support had been received at the time of this writing in late February, 2002). An expanded IVSC Task Force should begin drafting the Extractive Industries addition soon after the IASB announces the results of its review and consideration of the submissions, which is expected by May 2002.

In the review of mining and petroleum industry practice in the IASB Issue Paper, Steering Committee members expressed considerable concern about the lack of tight industry standards for the inputs into reserve and resource estimates, particularly economic inputs. Confusion by the Steering Committee is apparent in the document over what, if any, similarities might be drawn between the petroleum industry's reserve definitions (developed by the Society of Petroleum Engineers and World Petroleum Congresses) and the mining industry's Reserve and Resource reporting Standard (the Australasian JORC Code, adopted internationally through the Council of Mining and Metallurgical Institutions and incorporated in United Nations' definitions) (JORC, 1999; Miskelly, 2001). In addition to the lack of "quality" that Steering Committee members perceive in reserve and resource estimates, they express concern about the difficulties and inconsistencies in valuation of those reserves and resources. The petroleum industry has much more distance to cover in addressing these concerns than the mining industry. The petroleum industry's reserve definitions are looser than those of

the mining industry; the petroleum industry lacks an equivalent of the Reserve-Resource reporting Standard of the mining industry based on defined Competent Person requirements; and no equivalent of the Australian mining industry's VALMIN Code is present for petroleum (AusIMM, 1998). In drafting the submission, considerable effort was directed at explaining and demonstrating those differences and attempting to remove the confusion.

The following, directly quoted, are the main recommendations made in the IVSC submission:

- There should be a single reporting Standard for the extractive industries with differences between the mining and petroleum industries covered by individual rules.
- The *fair value* of Proved and Probable Mineral Reserves and proved petroleum reserves should be the preferential reporting definition in the primary financial accounts, with *historic cost* reporting for these reserves as an option. No reporting of value of probable or possible reserves for petroleum, or any Mineral Resource categories should be allowed in the primary accounts.
- For mining industry enterprises, quantitative and qualitative information should be included in the supplemental statements for all Mineral Reserve and Mineral Resource categories.
- For petroleum industry enterprises, quantitative information should be included in the supplemental statements for all proved and probable reserves. No reporting for possible petroleum reserves should be allowed, nor should such for any petroleum resource category. The IVSC Task Force has concluded that the content of the petroleum possible reserves category is much too speculative for public disclosure as reserves, while the potential for profitable extraction from the contents of the resource classes within a reasonably foreseeable timeframe is too low for public disclosure.
- For mining industry enterprises, reporting of the *fair value* of Measured and Indicated Resources should be encouraged in the supplemental notes, with mandatory *historic cost* reporting required as the alternative. *Fair value* reporting for Inferred Mineral Resources and exploration properties lacking defined Mineral Resources should also be allowed, subject to careful review for reasonableness, and only if such value does not compose a large portion of the value of the company, with *historic cost* basis being the alternative.
- *Fair value* disclosure for probable petroleum reserves should be allowed in the supplementary notes. Such disclosure should also be allowed for exploration properties lacking proved or probable reserves, subject to careful review for reasonableness, and only if such value does not compose a large portion of the value of the company. In both cases, *historic cost* basis disclosure should be the alternative.
- The IASB standard should specify that reports of Mineral Resource and Mineral Reserve estimates must be developed and reported in compliance with one of the CMMI-based standards. A Competent Person similar to that specified in the CMMI-based standard must take responsibility for the report. Reports of petroleum reserve estimates should comply with the SPE/WPC definitions. IASB should encourage the petroleum industry to develop a petroleum reserve reporting standard containing a competent person provision similar to that in the JORC Code.
- *Fair value* valuation of all mineral and petroleum properties should be performed by defined Competent Persons and the name and qualifications of such persons should be disclosed by notation in the supplemental statements. Guidance by a comprehensive internationally respected mineral and petroleum valuation standard should be specified. Presently the Australasian VALMIN Code is the only standard available that meets those criteria. However, the Task Force does not view it as suitable for direct application to meet such wide ranging needs. Development by IVSC of the Extractive Industries guidance section of the International Valuation Standards using VALMIN and CIMVal as a base will allow a truly international extractive industries standard suitable for all jurisdictions to be referenced by the IASB Standard.
- The proposed IASB Standard must allow changes in the value of mineral and petroleum assets to be made in the financial statements without being reflected in the profit and loss statements. A requirement to reflect such changes in the profit and loss statement will discourage reporting of negative corrections, while positive changes could frequently mask operating results.
- *Fair value* revaluation of mineral and petroleum properties should only be expected at four or five yearly intervals for inclusion in the primary accounts and supplemental disclosures or when major quantitative changes in reserves or resources occur that are not due to production.
- Any enhancements to the petroleum industry's resources and reserve reporting definitions which IASB determines are needed, or possible future development of a reserve reporting standard, should be coordinated through SPE/WPC or a successor international body representative of the petroleum industry as may exist at the time.
- Any enhancements to the mining industry Mineral Resource and Mineral Reserve reporting Standards which IASB determines are needed must be made through CMMI or its successor.
- The proposed Standard should clearly differentiate the current valuation requirements for *fair value* and *value in use*, the former being entirely market related and the latter being entity specific. *Value in use* should conform to existing IASB definitions to take account of account trading connections, contractual arrangements and management attributes and be related to identifiable cash flow units. *Value in use* calculations should not include internally generated goodwill in the cash flows.

Industry Support Needed

The negative attitude of the IASB Steering Committee expressed in the IASC Issues Paper towards disclosure of current value estimates and resource estimates for mineral deposits has considerable momentum. If not reversed, this negative attitude will result in the Extractive Industries IFRS being drafted to allow only historic cost accounting in the pri-

mary financial accounts and preventing quantitative disclosure of Resources and other non-Reserve mineralization. Discouragingly, it presently appears that the large majority of submissions received by IASB recommended limiting the extractive industries to historic cost accounting. Even Australasia's Joint Ore Reserve Committee (JORC) has campaigned for only historic cost accounting, which appears to have resulted from a lack of understanding of the relevant accounting and valuation goals, principles and practice (JORC, 2001).

For this negative momentum to be reversed so as to result in a favorable current value accounting outcome based on fair value reporting of Reserves in the primary financial accounts, there will need to be a great increase in interest and involvement from the mining industry, and particularly the petroleum industry at this late date. This must be reflected in moral and financial support for the IVSC's Extractive Industries Task Force's development of an Extractive Industries Guidance section for incorporation in the IVS, their meeting with IASB Steering Committee members during the drafting of the IFRS, and their critiquing of the IASB drafts of the standard(s) when it is published. The author has already made tentative arrangements with the IASB's lead person on this project to meet in London once the results of the analysis of the submissions is available.

A positive outcome from these efforts will provide immense financial benefits for the mining and petroleum industries internationally, especially when compared to the financially depressing alternative. In essentially one coordinated action, this can put in place Reserve-Resource reporting standards, Valuation Standards, and Competent Person requirements, for the mining and petroleum industries, for financial reporting for the securities markets worldwide, and similarly standards for valuations for private and public sector purposes unrelated to company financial reporting.

CONTENT OF THE IVS EXTRACTIVE INDUSTRIES ADDITION

The IVS and IFRS are nonprescriptive standards. They provide principles, concepts and general direction, then expect good judgment, honesty and professionalism in determining how to accomplish the goals. They provide few rules and little in the way of detailed guidance or benchmarks. Selection of this route to developing standards has been a very important philosophical decision regarding how to write the IVS and IFRS.

By comparison, the U.S. GAAP accounting standards are detailed and specific, because U.S. companies and auditors prefer them that way. This prescriptive accounting approach of the U S. GAAP is viewed by some experts as a reason behind some of the recent spectacular accounting disasters such as the collapse of Enron Corporation. In contrasting the two standards development policies, Sir David Tweedie, Chairman, IASB, recently told the U.S. Senate Banking Committee:

> "Companies want detailed guidance because those details eliminate uncertainties about how transactions should be structured. Auditors want specificity because those specific requirements limit the number of difficult disputes with clients and may provide a defence in litigation. Securities regulators want detailed guidance because those details are thought to be easier to enforce.
>
> "The IASB has concluded that a body of detailed guidance (sometimes referred to as *bright lines*) encourages a rule-book mentality of "where does it say I can't do this?" We take the view that this is counter-productive and helps those who are intent on finding ways around standards more than it helps those seeking to apply standards in a way that gives useful information. Put simply, adding the detailed guidance may obscure, rather than highlight, the underlying principle. The emphasis tends to be on compliance with the letter of the rule rather than on the spirit of the accounting standard.
>
> "We favour an approach that requires the company and its auditor to take a step back and consider whether the accounting suggested is consistent with the underlying principle. This is not a soft option. Our approach requires both companies and their auditors to exercise professional judgement in the public interest. ..... There will be more individual transactions and structures that are not explicitly addressed. We hope that a clear statement of the underlying principles will allow companies and auditors to deal with those situations without resorting to detailed rules." (Tweedie, 2002).

In drafting the extractive industries addition to the IVS, the Task Force will have to maintain the same nonprescriptive philosophy, instead including principles, concepts, general direction and goals. Specific instruction, recommendations and examples pertaining to analysis and methods should be kept out of the draft. If the valuer doesn't know what verification, analysis or methods his peers would consider appropriate, he needs to get appropriate experience or education elsewhere. We may look to the CMMI or national mining institutes to provide valuers with more detailed guidance.

The CIMVal Committee has done very good work in laying out the Draft CIMVal Standards so that the document reads easily, embodies the Generally Accepted Valuation Principles and the "Fundamental Principles" from the VALMIN Code, provides the necessary links to the relevant regulations, and ends with a useful "Recommended Table of Contents" for a valuation report. However, it will be difficult to take much material directly from the Draft CIMVal Standards since much is based on Canadian specific definitions and regulations; the Recommended Table of Contents fails the prescriptiveness test; and all other paragraphs would need to be reviewed to assure that they are not too prescriptive.

The Extractive Industries Guidance addition will also need to be structured very differently to the structure used in Draft CIMVal Standards document, though this does not cause any significant change in the application of the valuation principles. The layout will need to follow the same heading structure and style as the other IVS Guidance sections while also fitting within about a 20 page length. Thankfully the CIMVal Committee has already shown us how to keep the document concise. Also, general valuation definitions and concepts are provided elsewhere in IVS and will not be repeated in this section.

Important definitions and rules pertaining to mineral and petroleum properties, such as concise Mineral Resources and Petroleum Reserve definitions and general mineral industry valuation concepts and principles must be included. In particular, the important Competent Person concept for Mineral Reserve and Mineral Resource estimation must be included. Mineral Reserve and Mineral Resource category definitions and the Competent Person definition must be written in such a way that they are not country or mineral institute specific. Rather than including the various comprehensive definitions and tables pertaining to reserves, resources and exploration properties of SPE-WPC and CMMI-UNFC, it seems that they should be listed as important references. However, a review of the IVS shows that IVSC practice is to exclude such comprehensive material entirely. References to such external documents are not used.

Some guidelines should be included to aid the valuer in correctly classifying mineral and petroleum properties into the appropriate Property Types prior to valuation. Mineral and petroleum property holdings are generally real property, while certain interests in them will be considered financial or intangible. An operating mining business or mining company may need to be divided into its real property, personal property and intangible property components before valuation.

Similarly, once the draft extractive industries IFRS becomes available, it will be necessary to provide guidelines within IVS on how to conduct and report valuations to the requirements of that IFRS. It may prove appropriate to incorporate such guidance in the International Valuation Applications, where IVA 1 already covers financial reporting. It may be found that definitions and instructions within that IFRS conflict with or override the equivalent definitions within IVS. For example, the Extractive Industries IFRS could include a more stringent definition of the qualification and experience requirements of a valuator for mineral or petroleum properties.

CONCLUSIONS

Mineral industry institutes in countries such as the U.S. and South Africa should cease their initiatives to develop national valuation standards for mineral properties. Instead they should support the efforts of the International Accounting Standards Board and the International Valuation Standards Committee to develop extractive industries standards for inclusion with their existing standards. The IASB's International Financial Reporting Standards and the IVSC's International Valuation Standards are rapidly achieving complete global coverage and will likely make national valuation standards largely irrelevant within just a few years.

Based on tentative views expressed against resource reporting and current value accounting in the IASC Extractive Industries Issues Paper, and that a majority of submissions received favored historic cost accounting, it is likely that the IASB's Extractive Industries Steering Committee is disinclined to allow current value accounting in the Extractive Industries with fair value reporting for mineral and petroleum reserves. Due to this, the mining and petroleum industry companies will be handicapped relative to almost all other financial sectors, due to their stock prices being relatively depressed because of the historic cost accounting rules.

Mining and petroleum companies have not yet provided IVSC with any sponsorship for its Extractive Industries Task Force's effort to develop the IVS Extractive Industries Standard and the submissions to the International Accounting Standards Board on the development of the Extractive Industries International Financial Reporting Standard. Mining and petroleum industry companies should financially support the IVSC and its Extractive Industries Task Force to help assure a favorable outcome for the industry from these standards development initiatives. The author is hopeful that through IVSC's cooperation with the IASB's Extractive Industries Steering Committee, the outcome will be a favorable current value Extractive Industries International Financial Reporting Standard.

The author has provided his initial suggestions regarding the appropriate content for the IVS Extractive Industries Guidance addition. He has also proposed that the Council of Mining and Metallurgical Institutions and the World Petroleum Congresses develop supplemental valuation guidelines to support the IVS. National mining institutes should adopt the IVS and develop disciplinary procedures for members who violate the Standards. National mining and petroleum institutes or national regulatory bodies may find it beneficial to develop supplemental guidelines for application of the extractive industries valuation standards in their country.

Problems have arisen within South Africa due to the impending cutoff of 30 September 2003 on Valuation of mineral properties for capital gains tax purposes. The problem is due to the lack of an enforceable mineral property valuation standard within the country. The author suggests that SAIMM consider immediately adopting IVSC's International Valuation Standards and making it binding on its membership. Despite the fact that IVS does not yet contain specific instructions for extractive industries valuation, the author expects that most mineral property valuations can satisfactorily be performed under the existing Real Property Valuation provisions. The instructions for the other Property Types should also be found satisfactory. The author expects the existing IVS will be found superior for this purpose to the Uniform Standards of Professional Appraisal Practice that he has applied to mineral property valuation in the U.S. for many years, which also has no specific instructions for the extractive industries.

REFERENCES

Australasian Institute of Mining and Metallurgy (AusIMM), 1998, (VALMIN Code), Code and Guidelines for Technical Assessment and/or Valuation of Mineral and Petroleum Assets and Mineral and Petroleum Securities for Independent Expert Reports: 1998 Ed., Carlton, Vic., Australia, 23 pp; see also the AusIMM website: www.ausimm.com.

Australasian Institute of Mining and Metallurgy (AusIMM), 2001, Proceedings VALMIN '01–Mineral Asset Valuation Issues 2001: Sydney, Australia, 25-26 October 2001, The Australasian Institute of Mining and Metallurgy, Carlton, Victoria, Australia, Publication Series 5/01, 215 pp.

Canadian Securities Administrators (CSA), 2001, Financial Reporting in Canada's Capital Markets: Discussion Paper 52-401, Mar. 16, 2001, available at www.osc.gov.on.ca.

CIMVal, 2002, Draft Standards and Guidelines for Valuation of Mineral Properties: CIM Special Committee on Valuation of Mineral Properties, CIM, Montreal, Quebec, Canada, February 2002, 27 pp; available at: www.cim.org/committees/valuation_minerals.html.

Ellis, T.R., 2001a, U.S. and International Valuation Standards - The Future: Preprint # 01-161, SME Annual Meeting, Denver, Colorado, February 26-28, 2001, 10 pp.

Ellis, T.R., 2001b, Funding Dangers Posed by Extractive Industries International Accounting Standard: www.minevaluation.com, March 2001, 8 pp.

International Accounting Standards Committee (IASC), 2000, Extractive Industries: Issues Paper, London, November 2000, 412 pp; available at www.iasb.org.uk.

International Valuation Standards Committee (IVSC), 2001a, International Valuation Standards 2001: London, UK, 458 pp.

International Valuation Standards Committee (IVSC), 2001b, A Submission to the International Accounting Standards Board in Respect of: an Issues Paper Issued for Comment by the IASC Steering Committee on Extractive Industries: London, June 2001, 35 pp; available at www.ivsc.org/-pubs/submission0106-A4.pdf.

Joint Ore Reserve Committee (JORC), 1999, (JORC Code), Australasian Code for Reporting of Mineral Resources and Ore Reserves: 1999 Ed., The AusIMM, Carlton, Vic., Australia, 16 pp; available at www.jorc.org.

Joint Ore Reserve Committee (JORC), 2001, Submission by the Australasian Joint Ore Reserves Committee (JORC) to the International Accounting Standards Committee on the Issues Paper Extractive Industries: 7 pp; available at www.jorc.org/assubmission.htm.

Miskelly, N., 2001, Accelerated Progress on International Mineral Reserves Reporting Standards: The AusIMM Bulletin, No. 5, Aug.-Sept. 2001, pp 44-51.

Tweedie, Sir David, Prepared address to U.S. Senate Committee on Banking, Housing and Urban Affairs, 14 February 2002; available at: www.iasb.org.uk.

U.S. Securities and Exchange Commission (SEC), 1992, Industry Guide 7, first published in *Federal Register*, Vol 57, p. 36442, July 30, 1992; available at: www.sec.gov/divisions/corpfin/forms/industry.htm#secguide7.

Volcker, P., 2002, Prepared address to U.S. Senate Committee on Banking, Housing and Urban Affairs, 14 February; available at: www.iasb.org.uk.

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Control Report: End the PE Death March

Streamlining qualification would lead to more power and respect for engineers

By Dan Hebert, PE, Technical Editor

Engineers have no political voice. The legal system thwarts design and product innovation. Liability insurance rates for consulting engineers are sky high. The engineering profession is systematically devalued by the legal and legislative system. Politically powerful groups such as lawyers, unions, and large corporations determine the role of technology in our society while engineers stand by and watch.

What can be done to change this situation? A large group of professional engineers (PEs) must be established, and these PEs must be encouraged to create a community by joining an organization such as the National Society for Professional Engineers (NSPE, http://www.nspe.org). The first step to establishing such a community is to eliminate the PE death march. The PE exams will be given next month and again in April, so now is a good time to look at the grim statistics.

Only 959 control-systems engineers have passed the PE exam since its inception in 1992. This minuscule number represents less than 1% of the estimated 150,000 contro- systems engineers in the U.S. There are two main reasons why virtually no one is interested in becoming a controls PE: 1. PE registration is not required to practice most types of control-systems engineering; and 2. the PE death march.

These reasons also hold true for other branches of engineering. In theory, one must hold a PE license to practice engineering. In practice, politically powerful groups have added so many exceptions to this rule that there is in effect no licensing requirement for the majority of engineering activities. The lack of a licensing requirement depresses the salaries and status of engineers by opening the "profession" to all comers. The PE death march prevents the establishment of a critical mass of PEs, and this ensures that professional engineering organizations will remain weak, impotent, and politically powerless.

Engineers should have tremendous political influence. According to Dept. of Labor year 2000 statistics, there are approximately 2.1 million engineers and appoximately 881,000 lawyers in the U.S. There were approximately 100,000 new engineering graduates in 2000 (http://www.asee.org) as compared to approximately 40,000 new law school graduates (http://www.abanet.org). Why then does the American Bar Association (ABA) wield immense political power, while engineers struggle to make themselves heard?

It is because lawyers have straightforward, logical, and simple procedures for admission to the bar. Bar members consider themselves to be a community of professionals and they join their national organization in large numbers. About 50% of the lawyers in the U.S. join the ABA, making it the world's largest voluntary professional organization with more than 400,000 members.

Only approximately 20% of the 2.1 million engineers are PEs. Only approximately 15% of these 402,267 PEs are members of the NSPE. Close to half of the lawyers in the U.S. are ABA members, but only approximately 3% of U.S. engineers are members of NSPE. It is hard for the NSPE to fight and win legislative battles with the ABA and with other professional groups with only 60,000 members.

Of course, there is a Catch-22 here. Engineers cannot act as a cohesive and powerful group until professional status is easily attained and is a prerequisite for the practice of engineering. Such a prerequisite cannot be established without a cohesive and powerful group of professional engineers. Is there a way out?

The way out is for engineers to follow the path of lawyers. Attainment of professional status must be made straightforward and simple. Bar exam pass rates for first-time test takers are approximately 75% (http://www.ncbex.org). This number overstates the difficulty of the exam because many test takers are graduates of correspondence courses and other unaccredited law programs. More than 5,000 lawyers are admitted to the bar every year by motion or by diploma privilege with no exam required.

Contrast this procedure to the PE death march:

1. Graduate from an accredited four-year engineering program.
2. Pass the Fundamentals of Engineering (FE) Exam (the pass rate is approximately 75% despite the fact that only highly motivated individuals take the test).
3. Work for four years, preferably under the tutelage of a PE.
4. Negotiate a Byzantine application procedure requiring recommendations from past and present supervisors and coworkers, some of whom must be PEs.
5. Pass the PE exam (the pass rate is about 65%).

It impossible to precisely determine overall pass rates with the data available from the National Council of Examiners for Engineering and Surveying (http://www.ncees.org), so these pass rates are approximations, but an estimate of overall pass rates for first-time takers of both exams is sobering: The FE pass rate of 75% must be multiplied by the PE pass rate of 65%, and this yields an overall pass rate of only approximately 49% for a self-selected group of highly motivated engineers.

What would be a reasonable set of requirements? Follow the lead of lawyers. Enlist universities to persuade students to take the FE exam during the last few weeks of school. Make sure exam pass rates for first-time test takers are at least 75%. Let all students who pass the exam become PEs in their

respective states. Grandfather in all practicing engineers with four-year degrees and more than two years of experience.

If the ABA is any guide, approximately 50% of these PEs will join the NSPE, eventually creating an organization with more than a million members. The NSPE will then have the political strength to make PE licensing a requirement for the practice of engineering. They will also be able to broadly define what constitutes engineering work by removing the hundreds of exceptions that have been inserted through the years.

The NSPE is promoting a new model licensure law that relaxes current standards, but is still very stringent. The new procedure eliminates the technical portion of the PE exam, but all other requirements are maintained. This is a step in the right direction, but it does not go far enough. Critics (found at the forums on http://www.nspe.org) charge that the NSPE is just trying to expand its membership, increase its influence, and become more powerful. We can only hope that the NSPE is guilty as charged on all counts.

An oft-stated concern is that recent graduates will immediately begin to act as lead designers and engineers for large projects. Recent law school graduates aren't assigned to prosecute or defend multi-million dollar cases, and recent engineering school graduates will not be entrusted to design $500 million bridges. Logic and common sense will prevail over licensing laws, just as they always have.

Objections concerning the importance of work experience prior to licensing are outweighed by other factors. Lawyers know less about their particular field of practice after three years of school than engineers know about their discipline after four years of school. The difference is that lawyers realize that the value of a large and cohesive organization exceeds the value of work experience prior to licensing.

Some engineers believe stringent licensing requirements promote public safety. Public safety would be better served by a politically powerful engineering organization that could help to define and promote the proper role of technology and innovation in our society. The alternative is to let other more politically savvy groups set the agenda and make the decisions while engineers stand by and lament.

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Martian Surface Features Were Eroded by Liquid Carbon Dioxide, not Running Water, Researchers Say

WASHINGTON - Scientists have provided new evidence that liquid carbon dioxide, not running water, may have been the primary cause of erosional features such as gullies, valley networks, and channels that cover the surface of Mars. Research suggesting that condensed carbon dioxide found in Martian crust carved these features is reported by Kenneth L. Tanaka and colleagues at the U.S. Geological Survey in Flagstaff, Arizona, and the University of Melbourne, Australia, and will appear this month in Geophysical Research Letters, published by the American Geophysical Union.

Using Mars Orbiter Laser Altimeter (MOLA) data, Tanaka and his colleagues constructed elevation profiles of the Hellas basin, which, at 2000 km (1,240 mi) wide and 9 km (6 mi) deep, is the largest well-preserved impact basin on Mars. By examination of digitally created elevation profiles with 500-m (2,000 ft) resolution, they found that the volcanic regions of Malea and Hesperia Plana, along the rim of the Hellas basin, are several hundred meters (yards) lower than adjacent rim sectors. Additionally, these areas lack the prominent triangular peaks, called massifs, that are common in nearby areas.

Along the inner slopes of these regions, the researchers found, however, evidence of old massifs covered by volcanic rocks. They are too low to be covered, if there were volcanic activity today.The researchers suggest as an explanation that prior to volcanic activity, these regions along the rim of the basin resembled nearby areas, but were eroded to their present-day elevations following the emplacement of the volcanic rocks.

Tanaka and his colleagues propose a "magmatic erosion model" to explain the features of the volcanic areas of Malea and Hesperia Plana, suggesting that they underwent catastrophic erosion associated with explosive eruptions of molten rock.They suggest that liquid in the Martian crust was heated when molten rock, or magma, rose to the surface. As the liquid was heated, it expanded, until the pressure of overlying material was too great, and an explosive eruption occurred, shattering overlying rock, and causing it to move with the magma in an erosive debris flow.

The authors believe that the fluid in the crust along this area of the rim of the Hellas basin was mainly liquid carbon dioxide. A debris flow dominated by carbon dioxide would flow faster and farther than a water-based flow, they say. Also, carbon dioxide is more volatile than water at lower temperatures, and the cold temperatures found on Mars would mean that less carbon dioxide-based magma would be required to produce the observed erosion than magma containing mainly water.

The researchers suggest that this mechanism of erosion also can explain collapse features and channels elsewhere on Mars. They also note, however, that their model is based on a variety of assumptions that must be further tested.

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Rational Science for Rational Policy: The Endangered Species Act and the Law of Unintended Consequences

(Scientific Problems of the Endangered Species Act)

Lee C. Gerhard, CPG-03461 and Victor John Yannacone, Jr., Attorney and Advocate

The General Case

Legislation that addresses popular concerns often contains wording that creates problems greater than those the law was meant to address. Sometimes these unintended consequences occur inadvertently through failure to assess the long term impact and effects of present day actions, but sometimes the "unintended" consequences were really the result of deliberate efforts to accomplish agendas that may not have been otherwise favorably received at the time the legislation was considered. Legislators face the daunting task of supporting the major cause while opposing the hidden agendas.

The Endangered Species Act

The *Endangered Species Act* as currently implemented is ineffective. Some important endangered fauna may not be protected and others appear overprotected. There is no clear standard for population analysis and the definition of species is not scientifically valid. It is ineffective because actions taken under the act are now creating controversy rather than protecting biodiversity.

When the *Endangered Species Act* was proposed in 1966, it met with general approbation. People understood that the game animals of the African Veldt were declining in numbers, that other "headline" animals around the world were less numerous, and that it is an ethical responsibility of human beings not to unnecessarily impoverish the biodiversity of the Earth.

Estimates of human impact on global biodiversity vary greatly. At one recent meeting (Gerhard *et al*, 2000), participating biologists argued that the rate of extinction was 4,000 species per day, based on statistical studies of tropical rainforest diversity and loss of rainforest. The same biologists accepted 36 million as the number of species that presently exist. At that rate of extinction, no life would exist on earth in 25 years. Other people, such as Lomberg (2001), point out that the most likely consensus scenario is loss of 0.7% in biodiversity over the next 50 years, a far cry from 100% over 25 years. Credible analysis of the issue is needed, but is not available.

The 1966 *Endangered Species Act* (ESA) was only the first step down a legislative path that gradually expanded both the scope and the impact of the original 1966 act in 1969, 1973, 1978, 1979, 1982, and 1988. Today the amended ESA no longer stands as the beacon of environmental responsibility it was intended to be. Whether the ESA is viewed as the club of choice to bludgeon those who would develop land or resources, or the ultimate protection for plants and animals against the unbridled destruction of their habitat depends on the point of view of the observer in any particular controversy (Baur and Irvin, 2002). One thing is clear, however, the ESA has contributed greatly to the acrimony between environmental preservationists and resource users.

Purposeful or unintended, the ESA often pits urban wealth against rural poverty, and the American West against the East. According to a 1999 report from the House Resources Committee, 543 species were listed in the five Far West states, but only 39 were listed in the Northeast. Critical habitats were designated for 96 species in the West, but just nine in the East, despite the effects of eastern urbanization (*Wall Street Journal*, 2002).

Rarely has one well-intentioned and popular piece of legislation created so much rancor over so many years. Even in scientific journals, we have seen articles questioning a particular application of the legislation immediately followed by personal attacks on those who wrote the articles rather than reasoned arguments against the positions stated. The bitter and escalating emotional rhetoric is often the result of failure to understand the law or even read its language carefully.

Certainly it is rational to protect the biosphere from wanton species destruction. But it is no less rational to provide human beings with the resources they need to maintain the quality of their lives and improve their standard of living.

The Arkansas River Shiner

Consider the designation of the *Arkansas River Shiner* as a threatened species. This small fish has been extinct in most of the Arkansas drainage for many years and the actual original range of the shiner is not known. Dewatering of the Arkansas River in Kansas began during the last half of the 20th Century as a result of federal dams in Colorado. Subsequent withdrawals for irrigation from the stream aquifer along the river course in Colorado completed the dewatering, and except in times of very high runoff, surface water did not reach the Colorado/Kansas border. Thus, no fish of any kind were present in much of the Arkansas drainage.

In the mid-1990s the State of Kansas sued Colorado charging violation of water rights under the Arkansas River Compact. Kansas won the lawsuit and water was added to the Arkansas River system. Now water does flow though most of the Arkansas Channel most of the time.

Subsequent to the improvement in the river flow regime, the U. S Fish and Wildlife Service began the process of listing the shiner as a threatened or endangered species. The USFWS completed its listing in 1998. Since the actual range of the

shiner was then restricted to non-Kansas portions of the river, USFWS argued at the time that the designation of "critical habitat" was not prudent (Southwest Kansas Groundwater Management District, 2001). Thus, no significant public opposition was mounted to listing the shiner as an endangered species.

Once the listing was final, however, the USFWS rescinded its earlier determination and designated 1,148 mi of river and the 300 ft of adjacent land to be critical habitat for the shiner; 98% of the now "critical habitat" is private land.

Twenty-six grassroots groups have formed a coalition and filed a "notice of intent to sue" to reverse that listing of the shiner as an endangered species and the designation of the entire river as its critical habitat.

Unscientific, and inconsistent application and interpretation of laws that depend on scientific determinations has created citizen conflict with government.

It is not our place to decide for others what their standard of living should be, or to make more difficult the struggle of less fortunate people to attain their goals. It is, however, our obligation as citizens and scientists to point out some of the scientific problems with the ESA and to suggest how they can be resolved.

We believe we can have rational legislation protecting endangered species and their habitat, a sound rural economy, and an upwardly mobile society. To arrive at such a balanced position we will have to focus on the scientific rationale for the law and the constraints that can be fairly imposed on freedom of economic action.

There are three areas of scientific concern over the existing ESA: the definition of "species," the definition of the term "conservation," and determination of what characteristics define a species. The relatively new phenomena of defining species statistically, based on DNA, is yet another area of concern for scientists.

Definition of species: Most of us learned that the taxonomic term "species" referred to the basic building block of Linneaic taxonomy— the lowest formal taxonomic level at which an organism could be distinguished from all other organisms. Any subdivision of that taxonomic level was informal and poorly defined, often merely a way of honoring the scientist who first discovered or identified the organism. Our biology teachers defined species as organisms "incapable of interbreeding and producing fertile offspring." The standard example was the interbreeding of a horse and a donkey to produce the infertile mule.

However, the definition of species in the ESA is:

"The term "species" includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." (*The Endangered Species Act*, 93-205 et. seq).

It has been suggested that "The legal language of the Endangered Species Act contains a scientifically fraudulent definition of species, and does not provide at all for examination of the basis of designation of therein defined species." (Gerhard, 1998). The term fraudulent means "purposeful misrepresentation," a test that the ESA definition appears to meet.

The subspecies designation included in the federal definition of species is the root cause of the acrimony over protecting biodiversity. Some of the organisms protected are not necessarily those in danger of extinction as a true species, but are rather variants in a larger community. "Subspecies" are not sufficiently distinct taxonomically to justify their definition as species for the purpose of protection under a federal law.

Using population segments that may interbreed when mature as a definition also has its problems. Since species has already been defined in the ESA as subspecies, segments of subspecies can then be defined as separate species. Thus, each salmon run and each separate prairie dog town, can be considered a separate "species" for purposes of the ESA. Carried to extremes, New York City cannot eliminate its Norwegian rat population, because that population fits the definition of a "population segment that interbreeds when mature," and is not an insect "pest," the only recognized exception in the ESA (as a result of a 1988 amendment) (Littell, 1992. p. 16). The "distinct population segment" part of the species definition, if strictly applied to human populations, would result in the subdivision of humans into a significant number of species, based on the remoteness of some populations and other social factors.

Also, by act of Congress in 1978, invertebrates may not be divided into population segments (Littell, 1992, p. 16.).

An additional problem is the lack of "naturally occuring" in the definition, as we more frequently encounter invasions of exotic species that form distinct population segments.

The most obvious rational way to fix the definition of species is to make a simple change in the circuitous and scientifically unsupportable language of the existing statute: "The term "species" includes any species of fish or wildlife or plants which interbreeds when mature and whose viable offspring of such union are themselves fertile, and which naturally occur."

Any acceptable species definition must evoke positive responses to the query, "if the legal definition of species were to be extended to human populations, would it be socially acceptable?"

Standard of practice: *The Endangered Species Act* does not establish any scientifically justifiable criteria for designating species, much less subspecies. Nor is "distinct population segment" ever defined with any scientific rigor. Instead, the Secretary of Interior is empowered to use "the best scientific and commercial data available" in making decisions (Littell, 1992. p. 59).

The consequences of these oversights allow any individual to designate an organism to be a subspecies in taxonomic rank, and then by demonstrating rarity, argue for its listing as an "endangered species" entitled to protection against all human activity under the ESA.

There is clearly need to write into the Act a standard of practice for taxonomic designation, whether by legislative amendment or by judicial decision. One such standard might be acceptance by the International Commission of Zoologic Nomenclature, another general acceptance by widely recognized peer-reviewed scientific journals.

Definition of "Conserve:" Although accurately defined, the use of the term "conserve" in the Endangered Species Act

is misleading to the reader who does not follow the arcane language of the act. "Conserve" has traditionally meant "wise use." The ESA defines the word "conserve" as "preserve." The word "preserve" should be substituted in the act to clearly reflect the intent of Congress and the public.

Use of genetic codes for taxonomy: Cracking the genetic code of life has been a continuing process for a number of years. The results are showing up in both theoretical and practical applications such as genetically modified organisms. Advances in the science have been huge.

One of the results of the DNA research has been its application to taxonomy. In the last year, African elephants have been split into two species (Roca et al, 2001), based on DNA differences without regard to interbreeding. This is a strong indication that DNA may well be the device used to designate species for purposes of the ESA in the future. However, this is not a step to be taken lightly.

Currently, in both biology and paleontology, there is a tendency towards splitting taxonomic divisions, leading to more taxons, and with less important criteria used to differentiate taxons. While one can now argue physical resemblances as criteria for either maintaining or splitting one species into several, once statistical DNA methods are permitted, then mathematics can play a larger role in taxonomy than natural divisions. The legal ramifications of this advance in technology must be carefully considered.

Summary

Although the divisions between people and organizations over the *Endangered Species Act* are deep, more careful use of language and a few relatively simple technical modifications in the current act could mitigate the effects of overzealous implementation and lead to a consensus that protection of biodiversity is important and benefits all.

As Congress continues to debate reauthorization of the ESA, there is an opportunity for all concerned scientists to make the act work better and more equitably. Protecting biodiversity is a goal that should unite people rather than divide them.

References cited

Baur, D.C., and W.R. Irvin, 2002, Endangered Species Act: American Bar Association, Chicago, 582 p.

Gerhard, L.C., 1998, The Dilemma of the Geologist: Earth Resources and Environmental Policy: in, A Paradox of Power: Voices of Warning and Reason in the Geosciences, Welby, Charles, and Monica Gowan, eds.: Reviews in Engineering Geology, Geological Society of America, p.1-7.

Gerhard, L.C., P.P. Leahy, V.J. Yannacone, Jr., 2000, Sustainability of Energy and Water Through the 21st Century: Sponsored by the American Association of Petroleum Geologists Division of Environmental Geosciences, United States Geological Survey, United States Department of Energy, Geological Society of America, American Geological Institute, and the Energy Research Center of the University of Kansas. Taos, New Mexico, October 8-11, 2000. (Report in press, 2002.)

Littell, R., 1992, Endangered and Other Protected Species: Federal Law and Regulation: The Bureau of National Affairs, Washington, D. C., 185 p., 6 appendices.

Lomberg, B., 2001, The Skeptical Environmentalist: Cambridge University Press, 515 p.

Roca, A.L., N. Georgiadis, J. Pecon-Slattery, and Stephan J. O'Brien, 2001, Genetic Evidence of Two Species of Elephant in Africa: Science, v. 293, p. 1473-1477.

Southwest Kansas Groundwater Management District, 2001, The Pipeline, August, 2001,Garden City, KS, 2 p.

The Endangered Species Act, (P.L. 93-205, approved December 28, 1973; as amended by P.L. 100-707, approved November 23, 1988) (16 U.S.C. §§1531-1543), §1532.

Wall Street Journal, January 10, 2002, Dow Jones and Company, Inc., New York

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CONGRATULATIONS!

The American Institute of Professional Geologists Announces the Award Recipients for 2002

The American Institute of Professional Geologists is pleased to announce that the following individuals have been named the recipients of this year's Honors and Awards.

BEN H. PARKER MEMORIAL MEDAL
Larry D. Woodfork, CPG-02370

MARTIN VAN COUVERING MEMORIAL AWARD
Madhurendu B. Kumar, CPG-02370

JOHN T. GALEY, SR. MEMORIAL PUBLIC SERVICE AWARD
Thomas M. Berg, CPG-08208

AWARD OF HONORARY MEMBERSHIP
Michel T. Halbouty, CPG-00010
(Charter/Emeritus Member)
John W. Rold, CPG-00448
(Charter/Emeritus Member)
Roy J. Shlemon, CPG-01766

Awards will be given to recipients at the AIPG • AEG Annual Meeting in Reno, Nevada. The Awards Banquet will be held on **September 25, 2002**.

Utah Legislature Passes Bill to License Geologists

Janet S. Roemmel, CPG-09248, Acting Treasurer UCPG

House Bill (HB) 96, *Licensure of Geologists*, was passed with about 1.5 hours remaining in the 2002 Legislative General Session. Just before 10:30 pm on March 6, 2002, HB 96 was read on the Senate floor after several delays, in part due to the shortened legislative session caused by the Olympic Winter Games. Sen. Dan R. Eastman, our Senate floor sponsor, spoke in favor of the bill to the other 28 senators. The bill was one of the more contentious issues discussed that evening, with several senators speaking for and against the bill. A proposed amendment to strike the grandfather provision, and probably meant to cause the bill's demise, was defeated. HB 96 was referred to the governor's office and Governor Mike Leavitt sign the bill into law on the March 26, 2002 deadline.

The Utah Council of Professional Geologists (UCPG) was formed to coordinate the effort of passing the bill. In addition, the bill sponsors, Rep. Ralph Becker, Rep. Lamont Tyler, and Sen. Dan Eastman advised, testified, and advocated in committee and on the House and Senate floors. Rep. David Ure provided early and constant support from the initiation of the legislative process. Success also is a result of the UCPG's lobbyist, Frank Pignanelli, of Jones, Waldo, Holbrook, and McDonough and the UCPG's communications and public relations consultant, Jon Weisberg of Weisberg Communications. More information about the UCPG can be obtained at www.utahpg.org.

The new law will require geologists who practice before the public to hold a license. Although many geologists working for minerals and oil and gas companies will be exempt, state employees are not. The full text and current status of the bill can be obtained at the following URL:

http://www.le.state.ut.us/~2002/htmdoc/hbillhtm/HB0096.htm

Schedule for Implementation

HB96 specifies an ambitious date for implementation of licensure with the stipulation that a professional geologist practicing before the public in Utah must hold a license on January 1, 2003. Thus, the grandfather period (the timeframe during which applicants are not required to pass an examination as a requirement of licensure) will begin this year, with applications likely accepted in the fall. The grandfather period will extend through next calendar year. HB 96 states that on January 1, 2004, applicants must successfully pass an examination as an initial qualification of licensure.

Although HB 96 does not include exam specifics, the recommendations of the UCPG to the Division of Occupational and Professional Licensing (DOPL), have been to adopt the standardized American State Boards of Geology (ASBOG) examination. Twenty-six other state boards are members of ASBOG and offer the exam, usually two times per year, as a requirement of licensure. Using this exam will increase the probability of reciprocity with licensure programs in other states.

Qualifications

HB 96, *Licensure of Geologists*, will modify the existing *Occupations and Professions Code*, 58-1, the umbrella licensing act, by enacting the *Professional Geologist Licensing Act*, 58-77. The *Occupations and Professions Code* addresses general concerns of all licensed professions, such as reciprocity and penalties. The new *Professional Geologist Licensing Act* will set forth the qualifications for licensure. The qualifications include:

- Submit an application,
- Pay a fee,
- Be of good moral character,
- Hold a bachelors or graduate degree in the geosciences with 30 semester or 45 quarter hours of geoscience coursework,
- Have 5 years of experience with a bachelors degree OR 3 years experience with a masters degree OR 1 year experience with a doctorate degree, and
- Pass an examination if applying on or after January 1, 2004.

Professional Licensing Board

The *Professional Geologist Licensing Act* creates the Professional Geologist Licensing Board. The Act designates that the Board will be comprised of three professional geologists, the state geologist (Rick Allis), and one member representing the general public. The volunteer Board will designate one member to assist DOPL with complaints concerning the unlawful or unprofessional conduct of professional geologists.

Because DOPL will administer the program to license geologists in Utah, their first responsibility is to coordinate the creation of the Licensing Board. DOPL has solicited nomina-

tions from local and regional geological organizations, whose members may be interested in applying for a Board position. The composition of the Board will likely reflect different disciplines of geology.

The first Board will be charged with crafting and getting approval for regulatory rules to provide the specificity the law does not. DOPL and the Board will develop an application process that will be in place by later this year. DOPL will solicit, receive, and review applications, with the assistance of the Licensing Board, BEFORE the end of the year. Licenses must be awarded to practice geology before the public by January 1, 2003.

In contrast to many states with independent boards of geology, the Utah Professional Geologist Licensing Board will fulfill an advisory role in conjunction with DOPL. As the program administrator, DOPL will provide the primary review for applications, whereas the Board will assist DOPL when questions arise.

The Future of UCPG

The UCPG looks forward to its goals of education and awareness of the public and agencies as the community strives to understand the role and benefits of using the licensed professional geologist. In addition to tracking legislative activities that may affect licensed geologists, the UCPG considers pubic awareness a vital mission for the future of the profession.

AIPG•AEG PREMEETING FIELD TRIP
ONE DAY TRIP TO YUCCA MOUNTAIN, NEVADA
MONDAY – SEPTEMBER 23, 2002

Led by John Peck, AEG and Bob Levich, AIPG

Participants in this field trip will travel by bus from Las Vegas, Nevada to the U.S. Department of Energy's (DOE) Yucca Mountain site, located ca. 150 km (90 mi) northwest of Las Vegas on and adjacent to the Nevada Test Site. On 10th January, 2002, the Secretary of Energy informed the Governor of Nevada that he intends to recommend the Yucca Mountain Site to President Bush for a mined geologic repository for spent nuclear fuel and high-level radioactive waste. The potential repository is located more than 200 m above the water table in unsaturated rhyolitic tuffs of Miocene age. Field trip participants will visit the underground Exploratory Studies Facility, which includes an 8 km main exploratory tunnel, a 3 km Cross Drift and a number of alcoves and niches for conducting tests. We will examine the welded tuff of the proposed repository horizon 200 – 350 m below the land surface and visit several locales where Project scientists conducted hydrologic, geochemical, and thermal tests.

The field trip also will visit the crest of Yucca Mountain where participants will view and discuss the surface geology of the site including the volcanic and pre-volcanic stratigraphy, the tectonic setting including several faults and nearby basaltic eruptive centers of Pliocene to Recent age. The field trip will emphasize the hydrogeology of the unsaturated and saturated zones and its effect on the ability of the potential repository to isolate radionuclides from the biosphere. A symposium on Yucca Mountain will be held in Reno during the annual meeting. This trip will acquaint participants with the regional and site geologic and hydrogeologic settings.

A major topic will be the engineering geology of tunnels and alcoves in the densely welded rhyolitic tuffs of Miocene age. The main tunnel was constructed using a 25-ft diameter tunnel-boring machine (TBM). A smaller (16.5 ft) TBM was used for the second exploratory tunnel, known as the Cross-Drift. The trip also will visit the sites of various surface investigations.

Participants should plan to arrive in Las Vegas on or before Sunday, September 22nd. The field trip will depart at ca. 6:00 am on the morning of Monday, September 23rd. The trip will last all day and will return to Las Vegas late on Monday afternoon. AEG-AIPG Annual Meetings participants should plan to fly to Reno on Monday evening or early Tuesday morning. Robust footwear, long pants and sleeved shirts are required for underground access. Hard hats, eye and ear protection, lamps and self-rescue gear will be provided at the tunnel entrance.

This trip is on a DOE restricted-access facility. Non-U.S. citizens are welcome on the trip, but must provide ALL requested information at least eight weeks prior to the trip for access approval. U.S. citizens need to provide a photo-ID, social security number, date and place of birth, and current address on the day of the trip.

For additional or clarifying information contact John Peck at peckj1@juno.com [phone: (702) 255-5285] or Bob Levich at bob_levich@ymp.gov [phone: (702) 794-5449]. More information on the Yucca Mountain site and the Yucca Mountain Project can be found on the web at http://www.ymp.gov www.ymp.gov

Scientifically Speaking

Lawrence A. Cerrillo, CPG-02763

This past month I had the opportunity to attend a three-day conference where numerous technical papers were being presented. I was duly impressed by the amount of research being done, and by the quality of that research overall. What really disturbed me was the number of papers, though well researched and valuable to science, were so poorly delivered. It is unfortunate that those with the most to offer, seem to have the most difficulty in conveying that knowledge to us mortals that are computer challenged, and a bit long-in-the-tooth. **It need not be!**

If you are planning to present a scientific paper on a subject that took a considerable amount of time to research, and that contains a lot of data, you should be proud and excited about sharing what you learned. It stands to reason that you should demonstrate some level of excitement, some enthusiasm. Have fun in presenting your findings. There is nothing that says you cannot inject a bit of humor into a scientific presentation. It could be about some incident that you experienced while doing the research. Humor will connect you with your audience and let them know you as a human being. What a concept!

Power pointless! Everyone is using it and laser pointers. Great technology, and great for the presenter. Unfortunately, most presenters end up lecturing to the screen as though that were the audience. The same old problems persist with this new technology as with the old, namely illegible graphs, charts, maps, and whatever. If you are planning to use visuals, be sure that they enhance or add to the points you are trying to present, and most importantly be sure they are appropriate for the room in which you are presenting.

I am truly grateful for those individuals that take the time and energy to present a paper, but I would be extremely grateful to come away having been able to hear and see all that was intended to be presented. I have rambled a bit –most of you already know of what I speak, but because we still hear, or almost hear, many poor to mediocre presentations, let me list a few suggestions.

- Be excited and enthusiastic about your subject, and let your audience know that.
- Do not be afraid to use humor or to tell about yourself. Lighten-up.
- Practice, Practice, Practice.
- When using visuals, be sure they serve the purpose you intended, and they are legible in the room in which you are to present—even from 20 rows back!
- Make eye contact with your audience—this could be folks in the first couple of rows. The rest of us will get the message.
- Speak loudly and clearly. If microphones are available, use them. Do not be macho and expect everyone to hear your beautiful, natural voice. Do not talk to a screen off to your side, while the microphone is set up for you to speak into it while facing your audience.
- When asked questions, **ALWAYS** repeat the question before answering.
- If using notes, do so in a manner that does not detract. **AVOID** reading your entire presentation—better to hand-out your paper and sit down—most of us can still see well enough to read.
- Dress appropriately! This does not mean Armani or Versace, but if you look a mess it detracts from what you have to say.
- Practice, Practice, Practice.

My last comment comes from A Cowboy's Guide to Life by Texas Bix Bender, "You don't need decorated words to make your meanin' clear. Say it plain and save some breath for breathin'. " Make it a Great Day! Keep Presentin'.

SPONSOR A STUDENT!

To sponsor a student membership, simply fill out the form on page 23 of this issue, provide the name of the student along with your own, and return with the appropriate payment of $20 to AIPG National Headquarters. If you do not personally know a student to sponsor, but are interested in the program, the AIPG Executive Committee has compiled a list of students, and one will benefit from your generosity.

PROFESSIONALISM and GEOLOGY

William J. Siok, CPG-04773

There are many facets to the practice of geology. I'd like to suggest placing each aspect of our practice into one of two categories, either the technical (including applied) or the professional.

The technical portion would include most classroom training and whatever it is we do for a living as geologists. There are opportunities in the classic arenas of energy and mineral exploration and production: many find satisfying careers exploring for, developing, and protecting groundwater resources there is a continuing need for competent earth science teachers on the secondary level and for university level professors and researchers; and many other niches in law, business, and management. Of course, each of these career paths span the spectrum from government through the private sector.

The professional side is perhaps a bit more difficult to define. For some, the word "professional" simply connotes an achievement of a certain minimal level of competency and stature within the community. In truth, the definition of the term "professional" goes far beyond the ability to do good geology or to be recognized by peers or others.

Most of us would, in response to an inquiry, be able to describe our conception of those attributes which define "professional". Consider these definitions.

"Profession"—A calling requiring specialized knowledge and often long and intensive academic preparation. A principal calling, vocation, or employment. The whole body of persons engaged in a calling. (From ***Merriam-Webster Collegiate Dictionary 1998****)*

"Professional geological work"—Application of the principles, theories, laws, and body of knowledge encompassed in the science of geology at an advanced and skillful level requiring education, experience, and the capability of interpretation and evaluation. (From ***AIPG Definitions*** *January 12, 1991)*

"Professional"—a) of, relating to, or characteristic of a profession b) engaged in one of the learned professions c) (1) : characterized by or conforming to the technical or ethical standards of a profession (2) : exhibiting a courteous, conscientious, and generally businesslike manner in the workplace. (From ***Merriam-Webster Collegiate Dictionary 1998****)*

"Professional Geologist"—A geologist who has accumulated a minimum of eight (8) years' post-baccalaureate experience in the practice of geology as a vocation, and who has a sustained record of adherence to exemplary standards of professional and ethical conduct. (From ***AIPG Definitions*** *January 12, 1991)*

The concept of "profession" treats exclusively, at least by definition, of the body of knowledge pertaining to a vocation and those who practice that vocation taken together.

The concept of "professional", the adjectival form of the word, describes something other than mere competence in the subject matter. "Professional" suggests appropriate comportment on the part of the practitioner. Developing the concept "professionalism" a bit further, consider the following pronouncements.

"General Obligations:—Members should be guided by the highest standards of personal integrity and professional conduct.

"Obligations To The Public:—Members should uphold the public health, safety, and welfare in the performance of professional services, and avoid even the appearance of impropriety.

"Obligations To Employers And Clients:—Members should serve their employers and clients faithfully and competently within their overall professional and ethical obligations.

The AIPG web site <aipg@aipg.org> includes AIPG member resumes and employment opportunities. If you would like to post your resume on the AIPG web site or have an employment opportunity please e-mail it to <wjd@aipg.org>. Employment opportunities are listed on the members only portion of the web site.

"Obligations to the Institute and the Profession:—Members should continually strive to improve the profession of geology so that it may be of ever increasing benefit to society." (Canons 1-5, AIPG Code of Ethics)

and

"(a) Geology is a profession, and the privilege of professional practice requires professional morality and professional responsibility.

"(b) Honesty, integrity, loyalty, fairness, impartiality, candor, fidelity to trust, and inviolability of confidence are incumbent upon every member as professional obligations.

"(c) Each member shall be guided by high standards of business ethics, personal honor, and professional conduct." (From AAPG Code of Ethics)

It seems that there's quite a bit more to being a "professional" than simply having the intellectual capacity to practice the science competently. Perhaps a few questions will suggest topics for further consideration.

- Do you consider yourself a professional?
- What is professionalism?
- What is your concept of professional and professionalism?
- Is there a relationship between professionalism and ethical behavior?
- Does professionalism refer only to technical competence?
- Does professionalism include active participation in professional associations?
- Is there an obligation for professional practitioner to mentor students?
- Is there an obligation for the professional to 'give-back' to the profession?
- What does professionalism imply about conduct in the context of job, of career?
- Is one's manner of dress a reflection upon one's "professionalism"?
- Is there an obligation for the professional to maintain currency with technical, business, and social developments, particularly as these relate to job responsibilities?

SPONSOR A STUDENT

Lawrence A. Cerrillo

Lawrence A. Cerrillo,
AIPG 2002 National President

"AIPG provides a forum for geologists with a broad range of specialties to come together. As professional geologists, we promote public awareness of the effects of geology and geologic processes on the quality of life."

To sponsor a student membership, simply complete the form below, provide the name of the student along with your own, and return with the appropriate payment of $20 to AIPG, 8703 Yates Dr. #200, Westminster, CO 80031-3681. If you do not personally know a student to sponsor, but are interested in the program, the AIPG Executive Committee has compiled a list of students, and one will benefit from your generosity.

Full-time students pursuing a career in geology are immediately rewarded when becoming an AIPG member. Each will receive the journal *The Professional Geologist*, free access to the members only portion of the AIPG National Web site, and discounts on all AIPG publications.

AIPG STUDENT SPONSOR APPLICATION

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Return to form and $20 to: AIPG, 8703 Yates Dr., #200, Westminster, CO 80031-3681, or fax to (303) 412-6219.

President's Budget Request Recommends Reduced Funding for USGS

Submitted by John J. Dragonetti, CPG-02779

It should come as no surprise that the president' fiscal year (FY) 2003 budget request would substantially reduce funding for the U.S. Geological Survey (USGS), especially considering how last year's proposed USGS cuts were not only restored, but also increased by congressional action. Budget cuts seem to be a perennial problem for the USGS, in light of the fact that many of the agency's programs are national in scope. The White House Office of Management and Budget (OMB) has noted in both last year's and this year's budget documents that the key customer for USGS products should be Department of the Interior (DOI) bureaus. Obviously DOI is more interested in support for its own land and resource management bureaus than with external customers, despite the range of cooperative programs undertaken by USGS. Fortunately for the Survey, many of the externally focused programs have considerable support in Congress.

Another issue of concern is the lack of funding for USGS's significant activities in support of homeland security and the overseas war on terrorism. All four divisions of the USGS have been heavily involved in national security, but neither the emergency supplemental appropriations passed last fall nor the FY 2003 budget provide funds directly for these activities. This situation would require that all such costs be absorbed within the existing decreased allocation.

What is particularly significant is that the proposed reductions for USGS are housed within the largest DOI budget request ever. Mind you, a part of that figure is due to an accounting system that would require the agencies to list employee retirement and benefits as part of its annual budget, which is a new system for the federal government. Funding for DOI activities within the Interior and Related Agencies appropriations bill would total $9,704.2 million, but $245.6 million of this figure is in fact from the new accounting system. Without the employment benefits amount, funding for DOI activities would still increase, but only by $20.5 million to total $9,458.7 million. Department priorities seem to be focussed on restoring natural areas, rebuilding national parks and refuges, improving American Indian education and trust reform, and supporting the new Cooperative Conservation Initiative, more than sound science on which to base resource management decisions.

THE USGS BUDGET

The largest cuts in the president's request are proposed within the water resources programs. It is recommended that these programs receive a $28 million cut, which would result in a 13.6% decrease. The National Water Quality Assessment (NAWQA) program, which collects information on the quality of streams, ground water, and aquatic ecosystems, is marked for a significant cut. Currently the program gathers data from 42 large river basins and aquifers. The suggested $6 million decrease in funding would cause the termination of six study units, unless the program is able to follow the OMB recommendation that USGS obtain greater cost-sharing contributions from its partners and customers. Another program targeted for reduction is the National Streamflow Information Program (NSIP), which would see a decrease of $2 million (or 14.6%) under the budget proposal. This decrease would eliminate funding for 130 of the existing 7,200 streamgages. NSIP is a partnership between the USGS and more than 800 federal, state, tribal, and local agencies.

Two additional water programs are targeted for elimination —one via transfer out of the agency and the other via zero funding. The Toxic Substances Hydrology program would be cut by $4 million with the remaining $10 million in funding transferred to the National Science Foundation, where it would be absorbed into other programs. The Toxics program supports long-term research concerning surface and ground water contamination. It is a collaborative effort between USGS, local, state, and other federal agency scientists as well as university and private-sector researchers. Under the proposal, the funding for Toxics would be transferred to the Geoscience Directorate within NSF. Marked to receive zero funding, the Water Resources Research Institutes have had a history of being zeroed out in budget requests, then having Congress restore the cuts. An institute is situated in each of the 50 states, the District of Columbia, and the federal territories, making members of Congress especially fond of the program. Historically, the institutes have been a cooperative undertaking between USGS and states, with states matching two dollars for each one from the Survey.

Minor reductions are requested for geological programs. One program that was not saved from proposed cuts is the National Cooperative Geologic Mapping Program. The budget request would cut almost $6 million from this program, which is designed to produce digital geological maps as a cooperative effort between the USGS, the state geological surveys, and universities.

CONCLUSION

At the House Subcommittee on Interior and Related Agencies hearing held in March, committee members voiced strong opposition to the administration's plan to reduce funding for the USGS. Director Charles "Chip" Groat, who testified at the hearing, obviously constrained by his political leaders, defended the administration's request. He indicated that the decreased budget would require the reduction of 249 staff, but that he hoped this decrease could be accomplished through attrition and early retirements, rather than using the extremely unpopular reduction-in-force procedures. Subcommittee chairman Joe Skeen (R-NM) and ranking member Norm Dicks (D-WA) were extremely critical of what they considered to be substantial reductions in the agency's budget. Dicks indicated that the subcommittee had wisely rejected the same kind of proposal the year before. Other subcommittee members expressed concern about the impacts on specific programs involving water quality, flood monitoring, fire suppression, indicator species, energy exploration, and volcanic monitoring. It appears the Congress will not support the president's USGS budget proposal. However, the White House Office of Management and Budget, the agency responsible for crafting the federal budget, has made it clear that even though the FY2003 budget will require deficit spending, the government must show constraint in the growth of discretionary spending. The subcommittee hearing is just the beginning of the congressional appropriations process, so there are several more months before definitive action is taken.

The Government Affairs column is a bimonthly feature written by John Dragonetti, CPG-02779, who is Senior Advisor to the American Geological Institute's Government Affairs Program. E-mail: dragon@agiweb.org. For more information on the president's FY 2003 budget request and its impact on the geosciences, visit the AGI Web site at http://www.agiweb.org/gap.

BALLOT IN JUNE ISSUE

The June issue of *The Professional Geologist* will include the AIPG Candidate Articles, Biographicals, and the BALLOT to elect AIPG National Officers.

Only AIPG Members that have the right to vote will receive a ballot in their **JUNE** issue.

PLEASE REMEMBER TO VOTE!

Geologist Licensing Deadline Approaches

June 30th marks end of no-exam requirement for Washington state

Since July 2001, people practicing geology or advertising geologist services in Washington state are required to get a license form the Department of Licensing. This includes geologists working for businesses, state and local governments, non-profit organizations, and those who are self-employed.

Through the end of June, people with a minimum of five years experience in geology or geologist specialty field may apply for a Washington state geologist license without talking the national ASBOG exam or the state-specific engineering geologist and hydrogeologist specialty exams.

All completed applications must be postmarked by June 30, 2002 to the mailing address below. Applications also may be delivered in person to the DOL offices located at 405 Black Lake Boulevard in Olympia by Friday June 28. Please note that June 30 is a Sunday, and the office will be closed.

Complete applications must include:

- Application
- Application fees (first year initial license can be submitted at the same time)
- Sealed college transcripts or documentation of completion of educational equivalents
- Signed "Employment and Experience Verification" forms

Click on the Initial Application for Geologist and Specialty licensing to obtain the application and instructions.

Mail application to: Geologist Licensing Program, P.O. Box 9045, Olympia, WA 98507-9045. For more information, call (360) 664-1497 or to the geologist web site at <www.wa.gov/dol/bpd/geofront.htm.

AGI GOVERNMENT AFFAIRS MONTHLY REVIEW—FEBRUARY

Monthly review prepared by Margaret Baker, David Applegate, MEM-0002, AGI Government Affairs Program, and AGI/AAPG Geoscience Policy Intern Heather Golding.

FEBRUARY 2002

Yucca Mountain is President's Choice for Repository

On February 15th, President Bush announced his official decision to recommend the Yucca Mountain site to Congress for construction of a geologic repository for the nation's high-level nuclear waste. The president acted less than a day after receiving Energy Secretary Spencer Abraham's official recommendation, which was the culmination of 20 years and $4 billion of site characterization activities by the Department of Energy (DOE). Abraham noted in his letter to Bush: "The results of this extensive investigation and the external technical reviews of this body of scientific work give me confidence for the conclusion, based on sound scientific principles, that a repository at Yucca Mountain will be able to protect the health and safety of the public when evaluated against the radiological protection standards adopted by the Environmental Protection Agency and implemented by the Nuclear Regulatory Commission."

Nevada Governor Kenny Guinn (R) has until mid-April to submit a Notice of Disapproval to Congress, which he will certainly do (in addition to suing DOE for failing to follow proper procedures). Congress then must vote on the notice within the next 90 days that they are in session ("in the first period of 90 calendars of continuous session"). Unlike a presidential veto, the state's notice can be overturned by a simple majority vote in both houses. If it is overturned, then the Secretary of Energy has 90 days to submit a license application to the U.S. Nuclear Regulatory Commission. This series of actions could be over in a matter of months, although a recent General Accounting Office report suggested that DOE would not be ready to submit a license application for several years. Moreover, Nevada is launching a full-court press, both legally and politically, to stop the project. For more on developments related to Yucca Mountain, see http://www.agiweb.org/gap/legis107/yucca.html.

The March 2002 issue of Geotimes focuses on this country's nuclear legacy, including an article on Yucca Mountain by DOE scientists and a Comment on the site's unsuitability by Sen. Harry Reid (D-NV). Another article addresses contamination from nuclear tests at Amchitka Island in the Aleutian chain, and the issue also includes a photo essay on the Nevada Test Site. The Yucca Mountain article and comment are on the web at http://www.geotimes.org/mar02.

California School Board Ignores Geoscience Concerns

On February 1st, the American Geological Institute sent out an alert about a looming vote by the California State School Board on the implementation plan for the state's science education standards. Unlike the standards, which gave earth science an equal footing with other scientific disciplines in the curriculum, the implementation plan ("California Science Framework for K-12 Public Schools") recommended high-school graduation requirements for science under which earth science could only count in very specific circumstances, marginalizing the subject. The purpose of the alert and a letter to the school board president from AGI Executive Director Marcus Milling and Stanford Dean of Earth Science Lynn Orr was to encourage the board to delay action and address concerns about negative consequences for earth science instruction. The American Geophysical Union, Geological Society of America, and Seismological Society of America also sent out alerts on this issue. Other AGI member societies and California geoscience societies took action as well. Despite many e-mails and faxes sent by California geoscientists requesting a delay, the school board voted in favor of the Framework at its February 6th meeting. Subsequently, consultants for the board told geoscientists that their concerns were in error; however additional scrutiny suggests that this response is misleading. More on this topic, including AGI's rebuttal of the school board's response, can be found at http://www.agiweb.org/gap/legis107/cal_ed.html.

Special Updates Address FY 2003 Budget Request

As reported in a series of AGI special updates, President Bush released his fiscal year (FY) 2003 budget request on February 4th. Funding for the National Science Foundation (NSF) would increase by 5% over last year's allocation, but nearly half of the increase is due to program transfers from other agencies rather than new funds for existing NSF programs. All of the transfers are directed at the Geosciences Directorate, so that an apparent 13.4% increase is only 1.2% without the transfers, which Congress is not likely to approve. The biggest boost for the geosciences is the requested $35 million funding of the EarthScope project in the Major Research Equipment account.

The U.S. Geological Survey (USGS) would receive a 5% decrease under the president's budget. Water programs take the largest hits: the Toxic Substances Hydrology Program would be eliminated with a portion of its funds transferred to NSF, the Water Resources Research Institutes are zeroed out, a $6 million cut; the National Water Quality Assessment (NAWQA) program is to be reduced by a similar amount; and the federal streamgage program funding would drop by $2 million. Among geologic programs, the biggest cut is to the National Cooperative Geologic Mapping Program, which would lose nearly $6 million.

The budget request for DOE's Office of Fossil Energy (FE) looks remarkably similar to last year's request. The overall

FE request is down 5.2% from last year's allocation, and R&D activities are down 12.6%. Once again, natural gas (down 50%) and oil (down 37%) research programs are faced with particularly large cuts. The geoscience program within DOE's Basic Energy Science division would receive flat funding. The president's fiscal year (FY) 2003 budget requests a 40% increase (to $527 million) for DOE's Office of Civilian Radioactive Waste Management, anticipating a shift from site characterization to activities supporting submission of a license application to the U.S. Nuclear Regulatory Commission.

More information on the budgets for geoscience programs in NSF, NASA, NOAA, USGS, EPA, and DOE is available at http://www.agiweb.org/gap/.

Administration Proposes Clear Skies Initiative

The Bush Administration unveiled a new climate change policy called the Clear Skies Initiative on February 14th. This initiative plans to use voluntary industry participation to reduce U.S. emissions of greenhouse gases by 18% in the next 10 years. The initiative also sets targets to cut sulfur dioxide by 73%, nitrogen oxides by 67%, and mercury emissions by 69% in the same time period. All of these emission targets are to be met by using a cap-and-trade program. This market-based approach to clean air establishes a maximum industry emission "cap." The electricity generators must comply with a score card of allowance versus tons of pollution they produce. The government would regulate the amount of allowances for industry and gradually reduce them. To demonstrate the capability of the Clear Skies Initiative, EPA Administrator Christie Todd Whitman introduced the Climate Leaders program, which includes 11 corporations that have volunteered to participate. Sen. Joseph Lieberman (D-CT) responded to the Bush Administration's Clear Skies Initiative by saying, "Breathing the air isn't optional, and therefore reducing the greenhouse gases in it shouldn't be either." Lieberman and Sen. John McCain (R-Ariz.) are currently developing legislation that would set mandatory reductions.

Energy Legislation Too Heavy to Fly?

The long-awaited Senate debate on energy policy began at the end of February, but was quickly shelved due to complications with election reform legislation and the possibility of swift passage of a campaign reform bill coming over from the House. The Democrat's comprehensive energy bill, which has been folded into S. 517, is expected back on the Senate floor in early March with over 1,000 amendments possible. The bill includes tax incentives for fuel efficiency, an increase in the CAFE standards, climate change provisions, and renewable energy mandates (plus a whole lot more, weighing in at over 500 pages). The bill also includes up to $10 billion in loan guarantees for construction of a natural gas pipeline from Alaska's North Slope, and Senate Majority Leader Tom Daschle (D-SD) recently announced his support for a route that would parallel the Trans Alaska Pipeline System rather than go through Canada. The Democrats' focus on Alaskan natural gas is an attempt to shift focus away from opening the Arctic National Wildlife Refuge (ANWR) for petroleum exploration, which remains the most contentious aspect of the energy debate.

Rumors have swirled around the Capitol that the two sides are considering a compromise that would involve swapping Republican support of higher CAFE standards for Democrat support of limited drilling in a portion of ANWR's coastal plain, but those rumors are unconfirmed. The House-passed bill, H.R. 4, includes a 2,000-acre limit on drilling, but the acreage can be spread out over the entire 1.5 million acres of the coastal plain. Democrats claim that they have the necessary votes to block any ANWR legislation. However, Senate Republicans insist that the Democrats unwillingness to compromise will prevent attaining consensus on a national energy policy. Campaign issue, anyone? For background on the current debate, see http://www.agiweb.org/gap/legis107/energy.html.

House Science Committee Considers R&D Budget Request

On February 13th, the House Science Committee held a hearing on the research and development (R&D) budget proposed by the Bush administration for FY 2003. Committee Chairman Sherwood Boehlert (R-NY) expressed concern that the request was out of balance with almost all the increase going to the National Institute of Health, up $3.9 billion, and the Department of Defense, up $5.4 billion. Boehlert stated that other federal agencies have a great deal to offer to the administration's biomedical and national security priorities. The chair expressed concern about the transfers of EPA, NOAA, and USGS programs to NSF, expressing plans to investigate further. The committee heard testimony from John Marburger, the president's science advisor and Director of the White House Office of Science and Technology; Deputy Secretary of Commerce Samuel Bodman; NSF Director Rita Colwell; and DOE Chief Financial Officer Bruce Carnes. An alert from the American Geophysical Union provides additional details on the hearing at http://www.agu.org/cgi-bin/-asla/asla-list?read=2002-06.msg

On February 28th, the House Science Subcommittee on Environment, Technology, and Standards held a hearing on NOAA's Sea Grant program, one of the programs slated for transfer to NSF in the president's budget. Sea Grant is up for reauthorization, and the subcommittee looked both at the administration's transfer proposal and at a proposal to combine activities of the Sea Grant and Coastal Oceans programs within NOAA. Panelists at the hearing, with the exception of NOAA Administrator Conrad Lautenbacher, were strongly against the idea of transferring Sea Grant to NSF due primarily to the unique setup of the program — it uses 2 to 1 matching funds from states and has a large outreach and education component built into the research activities. Panelists did show some interest and support for the idea of merging Sea Grant and the Coastal Oceans programs within NOAA. More information on the subcommittee hearing, including testimony, is available at http://www.house.gov/science/-welcome.htm. The day before that hearing, the House Resources Committee passed H.R. 3389, the National Sea Grant College Program Act, which authorizes steady increases for the program through 2008.

New Material on Web Site

The following updates and reports were added to the Government Affairs portion of AGI's web site http://www.agiweb.org since the last monthly update:

- Earth Science Education in California (2-25-02)
- High-Level Nuclear Waste Disposal (2-25-02)
- Special Update: The President's FY 2003 Budget Request: DOE (2-23-02)
- Special Update: The President's FY 2003 Budget Request: NOAA, NASA & EPA (2-21-02)
- Oceans Legislation (2-20-02)
- Special Update: The President's FY 2003 Budget Request: USGS (2-7-02)
- Special Update: The President's FY 2003 Budget Request: NSF (2-6-02)
- Geotimes Political Scene: Anthrax in the House (by AGI 2000-2001 Congressional Science Fellow Katy Makeig; 2/02)

Sources: American Geophysical Union, Greenwire, Department of Energy, Library of Congress, National Center for Science Education, USBudget.com, U.S. House of Representatives website, U.S. Senate website, Washington Post, White House website.

This monthly review goes out to members of the AGI Government Affairs Program (GAP) Advisory Committee, 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 web site under "Government Affairs" <http://www.agiweb.org>.

AGI Launches Web Site Providing Free Information on Geoscience Careers and Employers

ALEXANDRIA,VA - This week, the American Geological Institute (AGI) launched a new web site highlighting information on all aspects of geoscience employment. This free publication, Guide to Geoscience Careers and Employers, is accessible online at http://guide.agiweb.org.

The Guide presents information on choosing, maintaining, and advancing a career specifically in the geosciences and provides useful geoscience-employer information that students need in order to find geoscience employment. It is designed as a "living" document—one that will be updated and expanded as new information becomes available. "This web site is a valuable resource for students, geoscience departments, and career centers," says Dr. Marcus E. Milling, AGI's Executive Director. "In today's rapidly changing world, knowledge of real-life work experiences and current workforce patterns are vital for anyone wanting to make informed educational and career choices."

The Guide's overview provides a summary of past and projected geoscience job markets, trends in college enrollments and degrees, employment trends and statistics, and job-hunting hints and strategies. Six employer categories are featured: oil and gas industry, mining industry, consulting firms in water resources and the environment, federal and state government agencies, national laboratories, and K-12 education. For each of these sectors, an experienced professional provides insight into employment trends, skills needed, and future directions applicable to that employment category. Also included are profiles of major companies and agencies, along with contact information, job descriptions, the recruiting process, and summer internship opportunities.

A companion publication, the free Guide to Geoscience Departments, also can be accessed from this site. This web-based guide lists detailed information on almost 200 college and university geoscience departments, including contact information, admission procedures, degree requirements, financial information (including housing), available financial assistance, field-camp information, research and support facilities (computers, labs, libraries), faculty teaching and research specialties, department geoscience specialties, and historical enrollment and degree data.

PROFESSIONAL ETHICS AND PRACTICES - COLUMN 74

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Our Inherent Biases: Global Warming as an Example

In chapter 2 of *Voodoo Science: the road from foolishness to fraud* (2000, Oxford University Press), physicist **Robert Park** discusses the bias introduced by the worldview held by scientists. He illustrates his point with a discussion of the current debate over global warming. Park briefly reviews some of the data and conclusions that have been collected to date and then states:

> If scientists all claim to believe in the scientific method, and if they have access to the same data, how can their be such deep disagreements among them? If the climate debate were just about the laws of physics, there would be little disagreement. What separates the two sides in the controversy in not so much an argument over the scientific facts, scientific laws, or even the scientific method. The climate is the most complicated system scientists have ever dared to tackle. There are huge gaps in the data for the distant past, which combined with uncertainties in the computer models, means that even small changes in the assumptions result in very different projections far down the road. Neither side disagrees with that. Both sides also agree that CO_2 levels in atmosphere are increasing. What separates them are profoundly different political and religious worldviews. In short, they want different things from the world.
>
> The great global warming debate then, is more an argument about values than it is about science. It sounds like science, with numbers and equations and projections tossed back and forth, and the antagonists believe sincerely that they are engaged in purely scientific debate. Most scientists, however, were exposed to political and religious worldviews long before they were exposed in a serious way to science. They may later adopt a firm scientific worldview, but earlier worldviews "learned at their mother's knee" tend to occupy any gaps in scientific understanding and there are gaps aplenty in the climate debate.[1]

Park goes on to state that our scientific training helps us separate the scientific worldview from "other ways of knowing to use a currently fashionable euphemism." Nevertheless, Park separates the sides in the global warming debate into those holding a Malthusian pessimistic view and those holding a technological optimistic view. The Malthusian pessimists suggest that we should proceed cautiously, that human behavior changes only slowly, and, thus, that we should act now to avoid a possible catastrophe of our own making in the future. The technological optimists insist that we should first understand what we are doing before taking action. Technologic optimism also can be viewed as cautious approach of a different type. If we don't know what we are doing, we may change things in different ways.

I believe that Park is correct that our fundamental worldviews constitute an important source of interpretational bias. However, I suggest that there may be other worldviews that introduce bias. We as geoscientists have developed a worldview that takes in our understanding of earth history and long time spans.[2] We recognize that climates have changed in the past and that geologically historic data should be considered in the global warming debate. Other scientific disciplines lack our view of history but, I suggest, have their own biases stemming from there individual characteristics. Physics might be characterized as demanding a very mathematical and quantitative approach to science.

Park notes that political views are important, but doesn't really delve into the issue. I believe they are very important. In a simplified version of the dichotomy, there are those who believe that individuals are smart enough to collectively act in their best interests, the "conservative view," while "liberals" are more inclined to believe that the "wise" among us should decide and take care of the rest of us. This conservative versus liberal dichotomy as presented is obviously very simplified, but I believe captures something inherent in these two political worldviews. Our cultural heritage, whether familial, tribal (by which I mean a larger but still relatively local grouping, which may or may not be identifiable with a traditional trib-

1. I trust that it is understood that by "religious worldview" Park is using a very loose definition of "religious." While many of us received traditionally recognized religious training while growing up, others of us did not. Nevertheless, I believe Park is correct in stating that all of us received some sort of worldview describing our place in the scheme of things along with relevant moral training. In this sense, even agnostics have a worldview that functions in the same way as a more traditional religious worldview.
2. The combination of Hutton's uniformitarian view of earth history with "no vestige of a beginning and no prospect of an end" and William Smith's recognition that fossils provided a useful method of stratigraphic correlation at the end of the 18th century provided the basis for geology's discovery of deep time (John McPhee's appropriate name for the concept) that is arguably geology's greatest contribution to western thought. Hutton and Smith provided the basis for the development of a very different worldview from that provided by study of the Bible as a guide to the Earth's history.

al grouping), regional, or national, also provides part of our individual worldviews.[3] You may be able to identify other worldviews.

While the foregoing discussion is brief and simplified, I believe that Park is correct in stating that our individual worldviews, which are an amalgam derived from a variety of sources, do provide an inherent source of bias. As Park pointed out in the second of the two paragraphs quoted above, although we may sincerely believe that we are acting strictly according to the scientific method, our individual worldviews affect our interpretations.

The existence of biases stemming from our individual worldviews do not harm scientific inquiry over the long term. Others with differing worldviews will examine our work and point out any mistakes we have made. This is science's self-correcting mechanism for dealing with biases, recognized or not, and is one of the things distinguishing scientific inquiry from other forms of inquiry.

Advocating Policy with Incomplete Data: Global Warming and Fault Line

The preceding discussion began with a summary of the effect of the bias stemming from one's worldview on one's view of the global warming debate. One side of the global warming debate believes that we must act now before the scientific inquiry is complete if we are to avoid the consequences of the perceived anthropogenic contribution to global warming. This side argues that we cannot wait to initiate changes in human behaviors through legislative and other actions. The other side argues that we don't know enough about the global climate system to either (a) confirm that there is an anthropogenic component and/or (b) that recommended changes might not be adequate or will result in adverse consequences, let alone the societal impacts of the recommended changes.

Sarah Andrews, in her latest Em Hansen mystery, *Fault Line*, presents a different example of the conflict between incomplete scientific knowledge and the need to take action. The technical issue presented in *Fault Line* involves landslide and seismic hazards in Salt Lake City and the siting of homes and buildings being constructed for the Salt Lake Winter Olympics–the book was written in 2001. The primary issue involves the projection of a strand of the Wasatch front faults coming south towards the downtown area where a number of fictional buildings, a shopping mall and a public arena, are proposed. The fictional state geologist is the murder victim due to her objections to granting building permits without adequate allowances for these hazards. Andrews, in an Author's Note at the end of the book, states:

> ... [T]he plot of this book was derived from a true story. In that true story, no state geologist was actually killed, but one was compelled to quit his job when he was told to keep his mouth shut regarding construction of a public building over the possible—many would say probable—location of a geologic hazard. The names and particulars herein have been changed to protect the geologist—whom I consider an ethical hero—from a slander suit. I find it frightening to note that those who muzzled this man got their way and built their building. If a large earthquake hits Salt Lake City within your lifetime, you'll witness the results of that folly.

I know another state geologist who some years ago warned a meeting of Utah attorneys of the seismic hazards of the Wasatch front and who suggested that many of the buildings in downtown Salt Lake City, which were not built with the seismic hazard in mind, would be destroyed by an earthquake within the buildings' useful lifetime.

The ethical issue in both the global warming and *Fault Line* examples involves advising on or advocating public policy on the basis of incomplete geologic data and knowledge when there is not time to resolve the scientific debate like global warming or seismic hazards in Salt Lake City.[4] Regardless of the position adopted, there will be those who can reasonably argue the other side. Should this uncertainty prevent us from advocating a position based on what we know? We have an ethical duty to protect the public's health, safety, and welfare above all other considerations. However, divided, reasonable scientific opinion dilutes our effectiveness as advocates. Furthermore, given the existence of the worldview biases we all have, we will probably be perceived by opponents of our position as being biased. I don't have all the answers to this question. Certainly the facts of particular cases will affect the answers. Nevertheless, I believe the question should be discussed. Your contributions are welcomed.

Topical Index to the Professional Ethics and Practices Columns

I have prepared a topical index covering columns 1 through 74 that has been placed on the AIPG web site in the ethics section. The index is in PDF format. The original file is in Microsoft Excel format. If you would prefer the Excel file, send me an e-mail and I'll send it to you. I'll update this index periodically and post the new copy on the AIPG web site. If you have suggestions on organization, please let me know.

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303-394-0321, fax 303-394-0543, DMAgeol@aol.com

3. For example, there are regional differences within the United States, western, eastern, southern, yankee, rural versus urban, etc. that affect our views on a variety of topics.
4. This contrasts with scientific debates that do not affect the public such as the debates over continental drift and plate tectonics; see Naomi Oreskes, 1999, *The Rejection of Continental Drift, theory and method in American earth science:* Oxford University Press, 420 p.

LETTER TO THE EDITOR

Project Reviews

Dear Editor:

I am a member of both AIPG and the Society of Economic Geologists and I receive *The Professional Geologist* and the *SEG Newsletter* from the respective organizations. The *SEG Newsletter* contains a section entitled "Exploration Reviews," from which I learn the current state of mineral exploration activity; I find the section very interesting and useful.

When I read *The Professional Geologist* I learn that there are issues that are receiving a lot of thoughtful examination but very little on what geologists are actually doing. Adding a section, perhaps titled "Project Reviews," to *The Professional Geologist* would provide those not directly involved with information on what our fellow geologists are doing. The difficulty of course is lining up correspondents who have the perspective to write the reviews by region or discipline.

Henry Truebe, CPG-10431

Editor's comment: I agree with Mr. Truebe's ideas. Are there any volunteers to help with this column?

CONGRATULATIONS!

The American Institute of Professional Geologists Announces the Award Recipients for 2002

The American Institute of Professional Geologists is pleased to announce that the following individuals have been named the recipients of this year's Honors and Awards.

BEN H. PARKER MEMORIAL MEDAL
Larry D. Woodfork, CPG-02370

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Madhurendu B. Kumar, CPG-02370

JOHN T. GALEY, SR. MEMORIAL PUBLIC SERVICE AWARD
Thomas M. Berg, CPG-08208

AWARD OF HONORARY MEMBERSHIP
Michel T. Halbouty, CPG-00010
(Charter/Emeritus Member)

John W. Rold, CPG-00448
(Charter/Emeritus Member)

Roy J. Shlemon, CPG-01766

Awards will be given to recipients at the AIPG • AEG Annual Meeting in Reno, Nevada. The Awards Banquet will be held on **September 25, 2002**.

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EDUCATION: 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

EXPERIENCE: 8 years beyond bachelor's degree, or 7 years beyond master's degree, or 5 years beyond doctorate

SPONSORS: 3 required from professional geologists, 2 of whom must be CPG's (see Section 2.3.1.4 of the Bylaws for exceptions)

CERTIFICATION/REGISTRATION: None required

SCREENING: Section and National

APPLICATION FEE: $50 (to upgrade from Registered Member or Member to CPG, the fee is $35)

ANNUAL DUES: $120 plus Section dues; both pro-rated for remainder of year when accepted

REGISTERED MEMBER

EDUCATION: No proof required

EXPERIENCE: No proof required

SPONSORS: 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

CERTIFICATION/REGISTRATION: Proof of current registration/licensure/ certification must be submitted with application and with annual renewals and must include expiration date

SCREENING: National

APPLICATION FEE: $30

ANNUAL DUES: $70 plus Section dues; both pro-rated for remainder of year when accepted

MEMBERS

EDUCATION: 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

EXPERIENCE: No proof required

SPONSORS: 2 required from professional geologists, one of whom must be a CPG, Registered Member, or Member

CERTIFICATION/REGISTRATION: None required

SCREENING: Section and National

APPLICATION FEE: $30

ANNUAL DUES: $70 plus Section dues; both pro-rated for remainder of year when accepted

STUDENT

EDUCATION: Currently enrolled in a geological science degree program*

EXPERIENCE: None required

SPONSOR: 1 letter from geological science faculty member

CERTIFICATION/REGISTRATION: None required

SCREENING: Headquarters can approve

APPLICATION FEE: $5

ANNUAL DUES: $15

ASSOCIATE

EDUCATION: None required

EXPERIENCE: None required

SPONSORS: 1 CPG, Registered Member, or Member

CERTIFICATION/REGISTRATION: None required

SCREENING: Headquarters can approve

APPLICATION FEE: $5

ANNUAL DUES: $60 plus Section dues; both pro-rated for remainder of year when accepted

**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.

CCGO Holds Its 3rd Sacramento Drive-In

The California Council of Geoscience Organizations (CCGO) delegation, including CPG Jim Jacobs (third from right), President of CCGO representing the AIPG, traveled to Sacramento on March 13. As part of CCGO's geological sensitivity awareness program, legislators were given copies of the CCGO Mission Statement and objectives, annual reports from the State Mining and Geology Board, and a copy of the American Institute of Professional Geologist's popular Homebuyer's Guide to Geologic Hazards.

The CCGO delegation included Richard Blake, Secretary of CCGO, representing AAPG Pacific Section; Betsy Mathieson, Past President of CCGO representing AEG - San Francisco; Jennifer Carbuccia, Legislative Committee, representing the Groundwater Resources Association of California; James Jacobs, CPG-7760, President of CCGO representing the AIPG; Tim Parker, Legislative Chairman representing the Groundwater Resources Association of California; and Sue Jogoda, Vice President and President Elect of CCGO, representing the California Earth Science Teachers Association.

Michel Halbouty to Receive Legendary Geoscientist Award

ALEXANDRIA,VA — Michel T. Halbouty, CPG-00010 (Charter/Emeritus Member), Chairman and Chief Executive Officer of the Michel T. Halbouty Energy Company, will receive the Legendary Geoscientist Award of the American Geological Institute (AGI) and AGI Foundation during the American Association of Petroleum Geologists' (AAPG) All-Convention Luncheon on Monday, March 11 in Houston. M. Ray Thomasson, President of Thomasson Partner Associates, Inc., President-Elect of AGI, and Past President of AAPG, will be the citationist. Halbouty is recognized as one of the world's preeminent geologists and petroleum engineers whose contributions to the petroleum industry and to society are virtually unparalleled.

He is the "perennial wildcatter" who has had a remarkable and distinguished career spanning more than 70 years as a geologist, engineer, businessman, and author. "Your commercial ventures have provided the essential energy resources that support our society, your research contributions enrich our academic community, and your service to Presidents help guide our country," said Thomasson.

Halbouty says, "I consider my profession and the science it represents as one of the most vital to the welfare of the world's people." Throughout his professional career, Halbouty has given a significant amount of his time and his expertise to ensure the economic stability of the U.S. and has been a member of numerous government panels and committees. He chaired President Reagan's Energy Policy Advisory Task Force during the 1980 presidential campaign and then served as leader of the Transition Team on Energy. He also served on the Board of Earth Sciences of the National Research Council.

Halbouty has been instrumental in the discovery of many oil and gas fields throughout the world and was the first independent to make a discovery in Alaska. He has written more than 300 papers on geology and petroleum engineering and is the author of several books including Salt Domes – Gulf Region, United States and Mexico, the only such single volume on the subject in the scientific literature. Several of his papers have been translated into Spanish, Russian, Chinese, and German.

With a double major in geology and petroleum engineering, Halbouty earned his Bachelor of Science and Master of Science degrees from Texas A&M University. He returned 25 years later to receive his Professional Geological Engineering degree. Halbouty was awarded an honorary Doctor of Engineering degree from Montana College of Mineral Science and Technology and an honorary Doctor of Geoscience degree from the USSR Academy of Sciences, the only honor the academy has bestowed to a scientist outside the Soviet Union. The University of Nanjing, People's Republic of China, presented Halbouty with an honorary Professorship in Geology to recognize his numerous contributions to the advancement of petroleum geology in China.

In January 2002, Halbouty was inducted into the Texas Science Hall of Fame. He is a member of the National Academy of Engineering as well as many professional and technical societies, including the American Association of Petroleum Geologists, where he is a past president; the Geological Society of America, where he is a fellow; the Society of Exploration Geophysicists; the Seismological Society of America; the American Institute of Mining, Metallurgical and Petroleum Engineers; the Society of Petroleum Engineers of AIME; the American Association for the Advancement of Science; the International Association of Sedimentologists; and the Association Mexicana de Geologos Petroleros.

AGI and the AGI Foundation created the Legendary Geoscientist Award in 1999 to recognize lifetime achievements in the geosciences. Previous recipients are J. David Love and Konrad Krauskopf.

NEW APPLICANTS AND MEMBERS (03/06/02) - (04/04/02)

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.

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CPG - Retired	507	497
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Registered Memb.	18	18
Associate Memb.	7	8
Student Adjunct	87	112
Honorary	20	21
TOTALS	4,555	4,514

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