Platinum Group Elements–Metals of the New Millennium
Quarry Reclamation and Reversionary Value
GPS and Geologists - A Ruling from the State DCA
Is the Climate Really Changing, and Why Do We Care?
The Northern Miner
Responsibility Affects Entire Capital Market
CPGs Accepted as “Qualified Persons” in Canada
SPONSOR A STUDENT MEMBER
AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
NATIONAL SCHOLARSHIP PROGRAM

Purpose
To assist students with college education costs and to promote student participation in the American Institute of Professional Geologists (AIPG). Four scholarships will be awarded to declared undergraduate geological sciences majors who are at least sophomores. Details for applying for these scholarships are provided below.

Scholarship Awards
Scholarship awards in the amount of $1,000.00 each will be made to eligible students attending a college or university in the U.S. Scholarships are intended to be used to support tuition and/or room and board. Awards will be made by September 1, 2002.

Eligibility Requirements
Any student who is majoring in geology (or earth science), is at least a sophomore, and is attending a four-year accredited college or university in the U.S. can apply. Also, the student must be either a student member of AIPG or must have applied for student membership at the time the application for the scholarship is submitted.

Each student who is awarded a scholarship agrees, by accepting the scholarship, to prepare a 600 to 800 word article for publication in TPG. The subject of the article must be related to a timely professional issue.

Application Process
Applicants must submit a letter of interest with name, address, and telephone number, proof of enrollment in an eligible geological sciences program, transcripts, and an original one-page essay on why she or he wants to become a geologist. The letter and essay should be submitted to the following individual:

American Institute of Professional Geologists
Attn: Education Committee Chair
8703 Yates Drive, Suite 200
Westminster, CO 80031-3681

Questions regarding the application process can be directed to either William Siok or Cathy O’Keefe by telephone (303) 412-6205 or e-mail: <aipg@aipg.org>.

Application Deadline and Award Date
Applications must be received by February 15, 2002.

Basis of Awards
Awards will be based on the content and creativity of the essays as judged by the Education Committee. The decisions of the Education Committee are final.

Miscellaneous
Application requirements for student membership to AIPG are as follows:
1. Student must be currently enrolled in a geological science degree program (as defined by the American Geological Institute).
2. Sponsorship is required via one letter from a geological science faculty member.
3. The application fee is $5.00.
4. Annual dues are $15.00.

AIPG student membership applications can be obtained from
American Institute of Professional Geologists
8703 Yates Drive, Suite 200, Westminster, Colorado 80031-3681
(Application forms are also available on the AIPG web site <www.aipg.org>.)
The Professional Geologist

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Photograph submitted by Daniel R. Heldenreich, CPG-10085.

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Introduction

During the last 24 months, a previously ignored group of metals has forced its way into the collective consciousness of the world's minerals industry. These metals are referred to as Platinum Group Elements (PGEs) and normally include platinum, palladium, rhodium, ruthenium, osmium, and iridium (Table 1). Of these elements, only platinum and palladium are mined as primary metals. The other four PGEs are recovered as byproducts, primarily from platinum, palladium, and/or copper-nickel production. Alaska has produced its share of PGEs and evaluation by Avalon Development suggests Alaska still contains significant potential to host economically attractive PGE occurrences in a wide variety of geologic settings. With few exceptions, there has been little targeted exploration of the over 200 known Alaskan PGE occurrences. Favorable current and future PGE supply-demand fundamentals suggest Alaska's prospective PGE potential will come of age in the new millennium.

Table 1: Platinum Group Element Factoids (WebElements, 2001)

<table>
<thead>
<tr>
<th>Metal</th>
<th>Atomic #</th>
<th>Spec. Grav.</th>
<th>Melting Point (°C)</th>
<th>Crustal Abundance (ppb)</th>
<th>Discovery Date</th>
<th>Source of Element Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platinum</td>
<td>78</td>
<td>21.4</td>
<td>1,769</td>
<td>37</td>
<td>1735</td>
<td>Platina, Spanish for &quot;little silver&quot;</td>
</tr>
<tr>
<td>Palladium</td>
<td>46</td>
<td>12.0</td>
<td>1,554</td>
<td>0.6</td>
<td>1803</td>
<td>Pallars, Greek god of wisdom</td>
</tr>
<tr>
<td>Rhodium</td>
<td>45</td>
<td>12.4</td>
<td>1,960</td>
<td>0.4</td>
<td>1844</td>
<td>Rhodon, Greek word for &quot;rose&quot;</td>
</tr>
<tr>
<td>Iridium</td>
<td>77</td>
<td>22.6</td>
<td>2,443</td>
<td>1.0</td>
<td>1844</td>
<td>Iris, Greek word for &quot;rainbow&quot;</td>
</tr>
<tr>
<td>Osmium</td>
<td>76</td>
<td>22.6</td>
<td>3,050</td>
<td>0.6</td>
<td>1844</td>
<td>Osme, Greek word for &quot;beauty&quot;</td>
</tr>
<tr>
<td>Ruthenium</td>
<td>44</td>
<td>12.4</td>
<td>2,310</td>
<td>0.1</td>
<td>1844</td>
<td>Osme, Latin word for &quot;Russia&quot;</td>
</tr>
</tbody>
</table>

PGE Production - Past and Present

Platinum use dates back at least 2,700 years where it has been found as hieroglyphic adornments on the burial casket of the Egyptian High Priestess Schepenupet (Platinum Collection, 2000; Johnson-Matthey, 2000a). The source of this platinum probably was the Yubdo deposits of western Ethiopia (Figure 1, Mogessie et al., 1999). It also was mined and fabricated with surprising sophistication as a gold-platinum alloy in pre-Columbian times by South American native inhabitants. It was in the Choco region of what is today Columbia that the Spanish Conquistadors discovered native platinum in alluvial gold mining operations in 1590 (Tisti, 1994, Platinum Guild, 2000). They named the curious metal "platina", or "little silver" because of its physical resemblance to native silver. Oddly enough, the Conquistadors considered platinum a worthless nuisance because it interfered with gold recovery in their crude placer mining operations. Ingenious forgers quickly learned that a gold-platinum alloy could be fabricated to look identical to Spanish gold coins thereby greatly increasing the number of coins that could be minted with a given amount of gold (Platinum Guild, 2000).

Platinum was first mentioned in European literature in 1679 by a Jesuit priest in Bohemia (Platinum Collection, 2000). It was this priest who named the curious metal “white gold”, a name platinum has retained in jewelry circles to this day. By the early 1700's platinum's high melting point (1,769°C) and resistance to corrosion caught the eye of the scientific community. The metal was rediscovered in South America by Antonio de Ulloa in 1735 (WebElements, 2000) but it was not until 1751 that platinum was isolated by a Swedish assayer named Scheffer and named after Mother Russia (WebElements, 2000).

By the early 1800's, demand for platinum had spurred exploration for the metal, particularly after Columbia, the world’s only significant producer of the metal up to that time, ceased exports in 1820. In 1819 alluvial platinum was discovered in the Ural Mountains of central Russia (Sedler et al., 1999). It was here that platinum was first minted as a coin of the realm, introducing the world to the notion that platinum, like gold, was a store of value. Throughout the second half of the 19th century and into the first decades of the 20th century Russian alluvial deposits continued to supply the world with most of its platinum.

By the 1920's, Russian alluvial deposits were in decline and the search for new sources of platinum eventually lead prospectors to the remote Taymyr Peninsula in northern Siberia. In 1935, the world's largest reserves of palladium were discovered at the now famous Noril'sk copper-nickel-PGE deposit (Fig. 1, Johnson-Matthey, 2000a). Recovery of PGEs as a byproduct of copper and nickel mining continues to this day.
at Noril’sk and at the more recently discovered district of Talnakh nearby. The Noril’sk – Talnakh region is currently the world’s largest producer of palladium and the world’s second largest producer of platinum and rhodium (Table 2
Johnson-Matthey, 2000b). Minor amounts of PGEs are produced from base metal operations on the Kola Peninsula near Russia’s border with Norway and from alluvial deposits at Kondyor in the Amur region and Koryak on the Kamchatka Peninsula. Johnson-Matthey (2001) estimates Russia supplied 1,100,000 ounces of platinum, 5,200,000 ounces of palladium, and 290,000 ounces of rhodium in 2000.

PGE exploration in the early 1900’s also lead to discovery of the world’s largest platinum reserves in the two billion year old Bushveld igneous complex of South Africa. Samples of a heavy silver-white metal were found by a local farmer and shown to Dr. Hans Merensky in 1924 (Johnson-Matthey, 2000b). Merensky traced these samples back to an outcrop of the main PGE-bearing horizon, which thereafter became known as the Merensky Reef. This outcrop turned out to be on the eastern edge of the 230-mile diameter Bushveld intrusive complex, host to the world’s largest known resources of PGEs. Continuous production began in 1925, with total historic production now topping 80 million ounces of platinum. Operations started in the Merensky Reef and have expanded to the metallurgically more difficult Upper Group 2 (UG2) reef. Both the Merensky and UG2 reefs are mined primarily by underground operations from PGE-bearing layers that average only one meter in thickness. Historic mining of the Bushveld Complex has been concentrated on the western end of the complex, although a number of new mine projects are scheduled for start-up in the next five years on the eastern end of the reef. The Platreef area on the northeast edge of the Bushveld complex is the only area of the Bushveld currently mined by open pit methods. The Bushveld complex is the world’s largest producer of platinum and rhodium and the world’s second largest producer of palladium (Johnson-Matthey, 2001). Current proven and probable resources in the Bushveld complex are estimated at 1.64 billion ounces of combined platinum plus palladium, equivalent to 125 years production at current annual production rates (Schouwstra et al., 2000). Johnson-Matthey (2001) estimates that South Africa production will increase by approximately 500,000 ounces of platinum in 2001 with proportionate increases in palladium and rhodium production. Additional production increases are planned over the next five years.
Although Alaska's Goodnews Bay alluvial platinum deposits were the United States' primary domestic source of platinum from the mid-1930's through the mid-1970's (Mertie, 1969), PGE exploration in North America in the 1970's revealed significant lode PGE potential in Montana and Minnesota. It was about this time that exploration of the Stillwater layered mafic-ultramafic complex in Montana began to focus on the potential of its PGE resources rather than its copper-nickel content. By 1986 the Stillwater PGE mine was in production and is now the world's third largest primary PGE producer, contributing 4% of the world's palladium and 2% of the world's platinum production (Johnson-Matthey, 2001). The mine boasts average grades in excess of 0.7 ounces of PGE per ton, making it the highest grade deposit of its type in the world (Table 1). The mine is expected to produce approximately 500,000 ounces of platinum plus palladium in 2001. Expansion plans are in progress that should bring production up to 665,000 ounces per year by 2002 (Johnson-Matthey, 2001). Additional production of approximately 330,000 ounces per year are forecast from their the deposit's East Boulder expansion program which should come on-line in 2001 (Stillwater Mining, 2001).

North America's only other currently active primary PGE mine is the Lac des Iles open pit mine in southern Ontario (Fig. 1). PGE mineralization was first discovered here in 1963, but significant resources were not defined until the late 1980's. The mine began commercial production in 1993 and has produced approximately 500,000 ounces of combine platinum plus palladium since commercial start-up (North American Palladium, 2001). Total resources at the mine now stand at about 7.3 million ounces of palladium at 0.05 ounces per ton. Expansion plans are in progress to bring production to 250,000 ounces of palladium per year, or 5% of world production.

Although platinum reserves and resources are closely guarded secrets in some parts of the world, estimates from various public sources indicate that more than two-thirds of the world's known PGE resources are in South Africa (Table 1). Total worldwide production in 2000 was estimated by Johnson-Matthey (2001) at 5.3 million ounces of platinum, 7.8 million ounces of palladium, and 766,000 ounces of rhodium. Barring supply disruptions from Russia, 2001 worldwide production of platinum should increase by 500,000 ounces, while palladium and rhodium production should remain relatively unchanged.

**PGE's in Alaska**

Although, Alaska now stands second only to Montana in total historic United States PGE production, in comparison to the rest of the world, the history of Alaska's PGE exploration and production is a short story. Over the past two years, Avalon Development compiled public records on PGE prospects in Alaska. Our database now contains 203 known mines, prospects, and occurrences that reportedly contain PGEs (Fig. 2). Of this total only 87 are lode occurrences. Our knowledge of the PGE contents of these lode occurrences is minimal since the PGEs were discovered only as an afterthought to copper, nickel, uranium, or chromium exploration. The remaining 116 PGE-bearing occurrences are alluvial in nature, primarily associated with placer-gold prospects that reported minor PGEs in heavy-mineral concentrates. The lode source of these PGEs is unknown and virtually unexplored.

Of the 87 known lode PGE occurrences in Alaska, only the Salt Chuck copper – palladium mine in southeastern Alaska had recorded production (approximately 20,500 ounces of palladium and 2,500 ounces of platinum) all of which took place prior to 1942 (Foley and others, 1989). Mining at Salt Chuck...
began prior to 1908 but platinum was not discovered until 1915 and palladium was not known to be present in the mine's copper-gold-silver ore until 1917 (Maas et al., 1995). The mine operated from 1908 to 1926 and from 1929 through 1942. During the latter period the mine produced 325,181 tons of ore grading 0.95% copper, 0.033 opt gold, 0.154 opt silver, and 0.057 opt palladium (18,300 ounces of palladium; Foley et al., 1997). Exploration of the Salt Chuck property was conducted by various parties between 1944 and 1998. Santoy Resources acquired the property in 1999 and conducted field work on the project in 2000. This program and earlier programs identified numerous untested Pd-Cu soil geochemical anomalies and IP/magnetics geophysical anomalies on the property (Santoy Resources, 2001).

The only other significant producer of PGEs in Alaska was the Goodnews Bay placer platinum operations in southwestern Alaska. Platinum was discovered in the area in 1926 and numerous small placer operations recovered placer platinum starting the next year (Fechner, 1988). Large-scale mechanized placer mining began with a dragline in 1934 and moved to a floating dredge in 1937. As the smaller creeks were mined out, dredging moved downstream to the main valley and east benches on the Salmon River where dredging continued uninterrupted through 1975 and intermittently from 1976 through 1986. Total estimated production from the Salmon River, and its tributaries is 646,312 ounces of platinum (Fechner, 1988). Additional placer resources totaling nearly 200,000 ounces are present in a number of deposits on the property. Lode exploration efforts conducted in the 1990s on the property have identified a number of untested geophysical and soil anomalies. The property is controlled by Corral Creek Corp. under lease from Calista Corp.

The remainder of the PGE production from Alaska is from poorly documented placer occurrences such as those on the Seward Peninsula and from beach sands in the Yukatat area. Total production of PGEs from these sources is estimated by Avalon Development to be less than 500 ounces, mostly as platinum metal. Total lode resources of platinum in Alaska are estimated at approximately 525,000 ounces of platinum at Brady Glacier where resources are 100 million tons grading 0.5% nickel and 0.3% copper with 171 parts per billion total PGEs (approx. 0.005 oz/ton, Foley et al., 1989).

**General Geology of Alaska PGE Deposits**

There are five main geologic settings that are favorable for PGE deposition in Alaska (Table 3). These classification and summary data are derived in part from Foley et al. (1997):

1. **Ural-Alaska type complexes**: There are 36 known PGE-bearing Ural-Alaska type occurrences in Alaska. Ural-Alaska type complexes are mafic to ultramafic plutonic bodies that commonly are associated with basal portions of Mesozoic volcanic arc terranes. These complexes commonly are associated with linear orogenic belts as much as 625 miles in length. Ural-Alaska type complexes normally are concentrically zoned, with dunite or peridotite cores surrounded by pyroxene-bearing rocks (pyroxenite, websterite, and lherzolite), which are in turn rimmed by more differentiated rocks including gabro and norite. Ural-Alaska complexes commonly range in size from 1 to 10 miles in diameter and cause variable sized contact metamorphic aureoles in surrounding country rocks. The world’s first platinum producers were the Choco placers derived from Ural-Alaska type complexes in Columbia (Tistl, 1994) however these types of complexes are best known from their type localities in the Ural Mountains of west-central Russia and from southwestern and southeastern Alaska and western British Columbia. Several of these complexes, including the Goodnews Bay complex in southwestern Alaska and the Kondyor deposits in the Urals, have been deeply eroded resulting in formation of significant placer PGE deposits. With the exception of the Salt Chuck and Goodnews Bay prospects, little recent exploration has been directed toward PGE mineralization in Ural-Alaska type complexes in Alaska.

2. **Differentiated sill-form complexes**: There are 34 known PGE-bearing differentiated sill-form type occurrences in Alaska. The best known Alaskan sill-form complexes are of Late Triassic age and are interpreted to be comagmatic feeders to the extensive Nikolai basalts of the Wrangellia terrane of south central Alaska. This belt of rocks extends into the western Yukon where it hosts the past producing Wellgreen copper-nickel-PGE deposit. These complexes consist of ultramafic and lesser mafic rocks with associated PGE mineralization in placer deposits, as well as, lode deposits associated with copper - nickel sulfide mineralization. Recent exploration in the central Alaska Range has identified a number of untested prospects containing anomalous PGEs. A number of these prospects were known to contain copper and nickel mineralization, but were not evaluated for their PGE content until recently.

3. **Ophiolitic complexes**: There are 78 known PGE-bearing ophiolite-type occurrences in Alaska. Ophiolitic complexes originate at ocean ridge spreading centers and are commonly composed of a basal unit consisting of differentiated ultramafic and mafic rocks overlain by sheeted mafic dikes which are in turn overlain by submarine basaltic lava flows often associated with deep-water marine cherts. Ophiolites are typically more complex structurally than other PGE-permissive settings due to transport on the host oceanic plate and their subsequent obduction at convergent plate margins. Jurassic-age ophiolites are common throughout Alaska’s major mountain belts. Ophiolites commonly contain anomalous chromium, copper, and nickel but the distribution of PGEs in Alaskan ophiolites is poorly documented. Ahtna Minerals recently discovered significant platinum and palladium in ophiolitic rocks on their Tonsina prospect in south central Alaska (Freeman, 2001).
4. **Synorogenic layered complexes**: There are 10 known PGE-bearing synorogenic layered occurrences in Alaska. The bulk of the world's platinum production is mined from synorogenic, mafic intrusive layered, complexes, primarily the Bushveld and Stillwater complexes. Sulfide and/or chromite and/or PGE minerals accumulate in distinct layers which form under quiescent conditions within a large magma chamber. In Alaska, all known layered complexes are Tertiary in age and are composed primarily of gabbro and norite with lesser gabbro-norite, troctolite, and anorthosite. Alaska deposits are hosted within the allochthonous Chugach Terrane in northern southeast Alaska. These prospects are essentially copper-nickel sulfide deposits with secondary amounts of PGEs. For example, the Brady Glacier deposit contains 100 million tons grading 0.5% nickel and 0.3% copper with 0.005 oz/ton total PGEs (Foley et al., 1989).

5. **Alkaline-to-subalkaline composite plutons**: There are 33 known PGE-bearing alkaline to subalkaline composite plutonic occurrences in Alaska. Composite plutons are the least well-documented and least understood of the potential PGE hosts in Alaska. These composite plutonic complexes are highly variable in age and their associated igneous rocks range from granitic to mafic to ultramafic. Alkaline and silica-saturated plutonic rocks are volumetrically more common than mafic to ultramafic intrusives. Many are concentrically zoned, with granitic cores and more alkaline and mafic outer zones. They form above active subduction zones in convergent plate margin tectonic settings and are thought to be the result of interaction between mantle and crustal melts. There is a growing body of evidence that suggests composite plutons and Ural-Alaska plutons are end-members of a range of plutonic complexes whose gross tectonic origins are similar. Zoned plutonic bodies which exhibit alkaline to subalkaline plutonic phases may have been generated under extensional conditions within a back-arc basin setting. Zoned plutonic bodies which are dominated by mafic and ultramafic rocks (Ural-Alaska) have chemical and physical characteristics suggestive of derivation within compressive regimes above active subduction zones. A number of the Alaskan composite plutons are associated with substantial placer gold deposits, which contain PGEs in minor amounts in heavy mineral concentrates.

PGE Supply and Demand

Although platinum is normally thought of as a precious metal, its industrial uses and those of palladium and the other PGEs, are helping to fuel an unprecedented worldwide growth in demand and price for the PGEs. Worldwide demand for PGEs increased at an average of 5% per year in the 1990s, outstripping the growth of every other metal by a large margin (Platinum Guild, 2000). Prices for the PGEs have moved up steadily and peaked in early 2001 at record levels before moving down to more reasonable levels. The most robust growth was in palladium whose average price was $127 per ounce in 1996 and whose average price traded above $1,000 per ounce in early 2001. Johnson-Matthey (2001) estimated that 2000 PGE demand reached 5.6 million ounces of platinum, 8.9 million ounces of palladium, 870,000 ounces of rhodium, 439,000 ounces of ruthenium, and 127,000 ounces of iridium (Fig. 3, 4).

The demand for PGEs in jewelry has increased by an astounding 82% in the last ten years but shows signs of leveling or dropping as higher metal prices have had a negative impact on the lower end of the platinum jewelry market. Global
jewelry consumption is expected to increase modestly in 2001, primarily on the strength of demand from Europe and North America (Johnson-Matthey, 2001).

Demand in 2001 should be at or above 2000 levels except for platinum, which is expected to increase as consumers substitute platinum for the higher-priced palladium in catalytic converter applications. Worldwide, platinum, and palladium demand for autocatalyst use is increasing, particularly outside of the United States as more countries are enforcing automobile clean-air standards which can only be met by use of palladium and/or platinum in catalytic exhaust converters (Johnson-Matthey, 2001). Platinum demand for this application is particularly strong in Europe since platinum is a more efficient catalyst for cleaning exhaust gasses from diesel engines. Sales of platinum for autocatalyst use are expected to increase again in 2001, while sales of palladium for the same use is expected to fall for the first time in over 10 years (Johnson-Matthey, 2001). The projected decline in sales of palladium for autocatalysts is the result of automobile makers drawing down stocks of palladium previously purchased at lower prices. Despite this drop in demand for new production, the actual amount of palladium used in autocatalysts in 2000 increased by over 20% compared to 1999. Substitution of platinum for palladium in autocatalysts and substitution of other rare metals for palladium in electronic applications is likely to cause sharply curtailed palladium buying in 2001, particularly if the price remain, above $500 per ounce.

On the horizon is perhaps the largest future growth sector for PGEs, that of fuel cell technology. The fuel cell concept, previously used in NASA’s Apollo and Space Shuttle programs, is driven by demand for cleaner, more efficient energy sources. A fuel cell is an electrochemical engine that converts the energy of a chemical reaction directly to electricity. Hydrogen (from a hydrocarbon source such as hydrogen, gasoline, or methane) is combined with oxygen (from the air) in the presence of a catalyst to produce electricity, heat, and water (Ballard Power Systems, 2001). The catalyst is platinum. Drastic price reductions and coincident increases in power-to-weight ratios are making fuel cells increasingly attractive for use in automobiles, for domestic power and heat generation and for a wide variety of medium and light duty electrical power applications. Equally important is the fact that fuel cells are mechanically simple and environmentally friendly, since they create electricity with virtually no moving parts and drastically reduced hydrocarbon emissions. Automobile manufacturers estimate they will have commercially available fuel cell-powered cars on the market by 2004 with up to one million fuel cell-powered cars on the road by 2010. Fuel cell-powered domestic electric production modules with outputs of 3 to 10 kilowatts are expected to be widely available by 2002. Alaska is leading the way in this technological revolution; the largest platinum catalyzed fuel cell in the United States, a 1 megawatt phosphoric acid fuel cell, was installed in Alaska in 2000 (Johnson-Matthey, 2001).

While demand for PGEs has been rapidly increasing, supplies of the PGEs have only recently begun to creep upward. In 1999 platinum supplies hit their lowest levels in five years while palladium supplies fell 400,000 ounces short of demand. Despite plans to increase production in 2000, South African platinum and palladium production actually decreased due to a strike and flooding, which affected production from both Anglo Platinum and Impala Platinum operations. A prolonged strike at Falconbridge caused decreased PGE production from their Sudbury operations in Canada. Despite reduced supplies of platinum from Russia in 1999, sales in 2000 topped 1 million ounces and are expected to remain at this level in 2001. Barring extraordinary problems such as those experienced in 2000, worldwide PGE production is expected to rise in 2001 such that supply and demand will become nearly equal (Johnson-Matthey, 2001).

Alaska PGE Potential

Alaska is well positioned to take advantage of a unique situation in the metals industry. Unlike virtually every other metal, the PGEs are facing a strong future demand coupled with relatively restricted supplies. Conditions such as these encourage active exploration for and development of PGE resources. Alaska’s diverse geology has left it well endowed with prospective PGE prospects, which have been ignored for most of the last century. With few exceptions, what we know about Alaska PGE occurrences was derived as a secondary benefit of exploration for other metals such as copper, nickel, chromium, or gold. This information, while valuable from an historic context, is often misleading with respect to the potential for PGE resources.

Avalon Development has taken the first steps to identify, categorize and prioritize the most promising PGE prospects in Alaska. The first two targets acquired for our clients have returned extremely encouraging results from properties that were previously open to location and acquisition. Additional PGE discoveries are expected to be announced in 2001. These discoveries promise to increase our understanding of the geology and mineralization of Alaskan PGE occurrences and hopefully locate economically viable PGE deposits for future development.

PGE’S for the New Millennium

The future of PGE exploration, development, and production seems bright despite the difficult political, social and environmental hurdles, which face the mining industry on a global scale. Some of the factors that contribute to this conclusion include:

1. Platinum is still the rarest of the precious metals and retains its historic role as a store of value and as an investment commodity.
2. Platinum and palladium remain two of the most useful, versatile and economically cost-effective industrial metals known.
3. Both the growing autocatalyst technology sector and several platinum-group mines now in and nearing production are the direct result of government intervention to improve air quality by cleaning vehicle exhaust emissions. This is a rare, in fact, unique instance in which an environmental policy is the cause of expanded mining activity.
4. In contrast with gold and silver, there are no large above-ground platinum stockpiles that can be sold onto the market to fill the gap against significant supply shortfalls or disruptions.
5. The only known above-ground palladium stockpiles are in Russia and these are thought to be rapidly dwindling, as Russia has met annual demand shortfalls over the last 10 years from their above-ground stockpiles.
6. Platinum is an integral component in the production of approximately 20% of all consumer goods. Platinum's unique physical properties make many industries dependent upon its use.

7. Roughly 90% of all platinum supplies come from South Africa and Russia. Virtually all of the platinum mined in South Africa is sold to industrial users.

8. Unlike gold, silver, and base metal deposits, the geologic settings that are conducive to PGE deposition are relatively rare. As a result, demand for PGEs is unlikely to result in a flurry of new discoveries that have the potential of flooding the markets with raw PGEs.

9. Products that contain PGEs commonly utilize extremely small amounts of PGEs per unit produced. This means that the firms that manufacture the products and the consumers that buy them are relatively insensitive to significant increases in the price of platinum or palladium. As a result, substitution of other cheaper metals for the PGEs is not expected to be a significant factor affecting PGE demand or price.

10. New clean air legislation in the United States (Tier II Emissions Standards) and in many of the world's fastest growing economies is significantly increasing the total demand for PGEs used in automotive catalytic converters.

11. Daimler/Chrysler, Ford, General Motors, and Toyota have announced plans to market automobiles powered by PGE-catalyzed fuel cells by 2004.


13. Platinum demand for jewelry has increased worldwide by 82% in the last decade and is expected to continue to be strong in the foreseeable future.

14. New PGE demand has outstripped new mine production by significant margins over the last decade. Even with planned new mine production increases scheduled for the next few years, supply and demand dynamics suggest strong prices for PGEs over the next 5–10 years.

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Quarry Reclamation and Reversionary Value

Earl G. Hoover, CPG-02739

Introduction

In the mid-1970s the rallying cry sent out by the aggregate trade associations to aggregate operators was come to Washington and help design national legislation mandating reclamation of pits and quarries. This collective effort paid off in that aggregate operators were able to assist in the design of “livable” legislation that came about because the public perceived that industry did not properly value environmental quality and as a result the government became the policeman.

Mined Land Reclamation and Planning

Ironically, in 1991, the National Stone Association (NSA) noted that of all the trends impacting the aggregate industry, the most dramatic is the trend toward the subsequent uses of mined-out pits and quarries viable second uses. No other single development carried out by the aggregate industry in the past nine years has bought it greater acclaim (Barksdale, 1991). The NSA noted that reclamation is a booming business, and nobody is happier to see worked-out mining sites turned into viable subsequent uses than the people who mined the material in the first place.

Pit and quarry operators are in agreement that reclamation costs are difficult to assess prior to the start of aggregate operations. One never knows what the costs will be to reclaim the land after mining ceases. Such factors as inflation, possible environmental damage, a change in regulations, and a citizen suit cannot be predicted in the planning stage. However, a reclamation plan based on geology, competent engineering and landscaping principles at the start of an operation is a strong foundation for achieving an enhanced value when mining operations cease.

A Rock Products (Carter, 1989) survey of operating expenses indicated that reclamation expenditures vary widely from producer to producer, ranging from less than one percent to as much as ten percent of total operating costs. More than 40 states have enacted laws regulating aggregate extraction operations, and reclamation plans are required by most permitting authorities before mining can begin.

Reclamation as a condition of the mining permit is an ongoing activity throughout the life of a pit or quarry operation. Successful companies treat reclamation as they would any other aspect of their operations—as a cost of doing business subject to analysis as market conditions warrant. As a consequence, costs for reclamation are passed on to the customer, as is the case in any other enterprise. Rock Products (Carter, 1989) also found that the directors of aggregate industry state associations noted that their members would rank reclamation as less important than other day-to-day operating concerns, such as noise, dust, truck-traffic control, blasting vibration reduction, or hours of operation.

Despite local pressures, trade association recognition programs, and the possibility of financial returns, reclamation is not a universally accepted concept, even within companies that have established a history of rehabilitation and development. The propensity of American management to focus on short-term results make it difficult to justify rehabilitation expenditures that may be slow or unable to turn a profit. However, most experts agree that a sure way to incur excessive rehabilitation cost is to begin mining without an ultimate end-use plan in mind (Carter, 1989).

It is a common perception that mining destroys land values and makes land unusable for wildlife and for human use. While mining alters the shape of the land, it locally provides a reconfigured piece of land that is of more interest and value than it was in its premined state. In addition, few other land uses present the opportunities to create new and productive wildlife habitats, marshes, and wetlands than exist through mining. It is often the very characteristics of a pit or quarry that are cited as unwanted that evolve into the most attractive and valuable features for the end use, namely, irregular topography, steep walls, rock outcroppings, and recreational bodies of water (Bauer, 1991).

Economic Incentive and Reversionary Value

Economic incentive is the overriding accelerator for corporate interest in reclaiming a quarry or pit. Capital investment requirements are high, financial returns are normally long-term, and market fluctuations have a severe impact on allocating money to a reclamation project. Because of the long life of a pit or quarry, developers often are reluctant to commit to a project that is 20 or more years away. The present value, or present worth, method of measuring investment proposal desirability is a widely used technique. The present value (PV) simply represents an amount of money at the present time (t=0), which is equivalent to some sequence of future cash flows discounted at a specified interest rate. This technique recognizes the time value of money and provides for the calculation of an amount at the present time, which is equivalent in value to a series of future cash flows (Gentry and O’Neil, 1984).

Present value calculations are most frequently performed to determine the present worth of income-producing property, such as an existing pit or quarry. However, they also can be used to estimate the potential income from a reclaimed pit
or quarry. If the future annual cash flows can be estimated, then by selecting an appropriate discount rate, the net present value of the property can be calculated. This should provide a reasonable estimate of the price at which reclaimed property could be bought or sold.

AIREA (1979) defines reversionary as being the net proceeds of resale of the real estate at the end of a period of ownership. Paschall (1993) authored a compact reference on the appraisal of aggregate operations and one of the topics mentioned was post-mining use and reversionary value. He also included a discussion on deriving a discount rate, noting that it is the most contentious element in appraisal cases and the one most subject to unprofessional conclusions.

The following example for arriving at a reversionary value for a reclaimed quarry is strictly illustrative and has no basis in fact. The example assumes a five year life for the aggregate operation, an annual reclamation expense of $20,000 the first four years, a 12 percent discount rate and the sale of reclaimed property to a real estate developer for $200,000 in year five. The pre-tax net present value of this example is $52,700. Obviously, in the case just presented, there is an economic incentive to reclaim. But as noted previously, an aggregate operator is production oriented, what matters most is “cash-in-hand”, not “pie-in-the-sky”. Nevertheless, in recent years, land values have skyrocketed in much of Florida and this has caused a major rethinking of reclamation. Of considerable interest are the changes in mine reclamation laws and regulations issued by the state of Florida.

Florida has been a trendsetter in pit and quarry reclamation laws. An overriding factor for reclamation is the fact that many pits and quarries are located near fast-growing population centers and as a result, the properties after mining are like money in the bank.

Another interesting trend in Florida is the fact that there are old quarries that were abandoned without reclamation prior to strict reclamation requirements. Because it is easier to obtain permits to quarry the remaining reserves, which in many cases are too small for the large operators, smaller companies are applying for permits to reopen the old quarries with the object of reclaiming the land as the remaining reserves are quarried or to simply reclaim the land and reap a reversionary profit. The permit process includes a plan for reclamation; therefore, the regulatory agencies are more than pleased to assist an operator who will reclaim an abandoned site and restore it to the tax base and, in turn enhance the environment. In many cases, these ventures are in partnership with a real estate developer.

**Land Reclamation In Florida**

Prior to presenting details found in Chapter 378, Florida Statutes, Land Reclamation, it is fitting to summarize the pioneering effort by Dade County, Florida. In February 1961, the Dade County Environmental Resource Management Department reported upon their criteria to review lake excavations in Dade County. Rock pits are defined as: “a lake resulting from the mining of limestone from the Biscayne Aquifer. Rock pits are usually in undeveloped areas, but later may be developed”.

All lake excavations in the unincorporated area of the county require an “unusual use” zoning approval. There are several criteria applicable to all lake excavations; however, only a few will be mentioned. Grading, leveling, sloping of the banks, and perimeter restoration is to be on a progressive basis as the project develops and the excavation progresses. A cash or surety bond is required in order to insure compliance with all terms and conditions. The use permit is renewable every two years by the Dade County Environmental Resource Department Management. The regulations that are reviewed next include provisions for lakes created by aggregate mining. These regulations were first implemented in July 1987, and are administered by the Florida Department of Environmental Protection.

Partly in response to state mined land and reclamation laws and public pressure that has put teeth into reclamation laws regarding mined-out pits and quarries, Florida has been a leader in the southeast in regards to reclamation of mined properties. Chapter 378, Florida Statutes: Land Reclamation addresses: Part I, General Land Reclamation; Part II, Phosphate Mining and Reclamation—Research; Part III, Phosphate Land Reclamation; and Part IV, Resource Extraction Reclamation. Part IV: “Resource Extraction Reclamation Act” is the section of the statutes that applies to construction aggregate operations. In promulgating Part IV, the Legislature stated that Florida is endowed with varied natural resources that provide recreational, environmental, and economic benefit to the people of the state.

The statutes also provide, in case of non-compliance, for civil liability for any operator who begins resource extraction without meeting the requirements. Under the statute, the operator is liable to the state for any damages caused to the water or property, including animal, plant, or aquatic life of the state, and is liable for reasonable costs and expenses of the state for restoration.

Rather than discuss in detail the various provisions in the statutes regarding limestone mines, I refer the reader to Chapter 62C-36 of the statutes which are the rules of the Department of Environmental Protection, Bureau of Mine Reclamation, regarding limestone reclamation requirements.

The Legislature recognized, as previously noted by others, that the rehabilitation and conservation of resources will be assured only through proper planning and through consideration of the impact of resource extraction upon the environment, as well as, upon the land use of the surrounding areas. They noted that reclamation as provided for in this part will allow the extraction of valuable resources while still providing for the protection of the public’s health, safety and welfare, the protection of the state’s environment, and the subsequent beneficial use of the disturbed and reclaimed land.

It is most interesting to note that the requirements stipulate that an operator holding title to lands mined may request the department to accept a donation of such lands as part of completing reclamation pursuant to the rules. Such request is to be accompanied by an offer to transfer to the state, the title to the land involved and suitable ingress and egress therefrom. If accepted as donations, such land may be leased back to the operator for mining operations.

It was the concern of operators that the expense of complying with the reclamation requirements would drive the cost of construction aggregates sky-high. The state mined-land reclamation law was enacted in 1987, and during the intervening years the increase in unit value of crushed stone sold or used in Florida has been less than the percentage of inflation—going from $4.20 per ton in 1987 to $5.14 in 1995, or approximately two percent per year. Pit and quarry operators
have found that they can live within the law and, in fact, find that being a good steward of the land pays dividends at the end of the mine life.

Conclusion

Clearly, pre-mine planning is a basic component of mining and reclaiming the land after mining. The economic incentive for planning and incorporating a reclamation plan increases reversionary value. The Florida land reclamation law has been good for the public and it has not resulted in higher than ordinary costs for construction aggregates. Although the state has grown more politically conservative, there is no way the politicians can roll back land reclamation laws without incurring the wrath of those who vote and are active, namely, older residents who came to Florida seeking quality of life in the Sunshine State.

References Cited


AIPG Reviewers: Robert A. Stewart, CPG-08332 and Jennifer J. Johnson

U.S. Geological Survey Mendenhall Postdoctoral Research Fellowship Program

The U.S. Geological Survey (USGS) invites applications for the Mendenhall Postdoctoral Research Fellowship Program for Fiscal Year 2003. The Mendenhall Program provides an opportunity to conduct research in association with selected members of the USGS professional staff. Through this Program the USGS will bring current expertise in science to assist in implementation of the science strategy of its programs. The Program also is intended to provide research fellows with experiences that enhance their personal scientific skills and accomplishments. Fiscal Year 2003 begins in October 2002.

Opportunities for research are available in a wide range of areas including: application of stable isotope and trace element techniques to ecological studies; hydrogeology of fractured-rock aquifers; gas hydrate field and lab investigations; bitumen generation and oil expulsion; landslide process studies; exploring active volcano-tectonic processes; in situ studies of faulting and earthquake generation; carbon dioxide sequestration; carbon cycling; remote sensing research; applications of numerical modeling; and developing magnetic models linking geophysics and geology.

The postdoctoral fellowships are two-year USGS appointments with full benefits and salaries. The closing date for applications is January 18, 2002. Appointments will start between October 2002 and May 2003, depending on availability of funds. A complete description of the program, research opportunities, and the application process are available via the internet at http://geology.usgs.gov/postdoc. The U.S. Geological Survey is an equal opportunity employer.

Colorado Geological Survey Releases Evaluations of Mineral and Mineral Fuel Potential of State Lands in Jackson County

The Colorado Geological Survey (CGS) recently released a report on the mineral and mineral fuel potential of Jackson County. Open File Report 01-15; Evaluation of Mineral and Mineral Fuel Potential of Jackson County State Mineral Lands Administered by the Colorado State Land Board, contains a summary of the geology and mineral resources of Jackson County and an evaluation of each state-owned tract. The report also includes maps showing tract locations, oil and gas tests, coal occurrences and mineral prospects.

This publication, in CD-ROM format, is the latest in a series of reports prepared by CGS on the 4,000,000+ acres of land administered by the State Land Board, and contains information useful to individuals and commercial entities as well as local, state, and federal agencies.

Colorado Geological Survey
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HAVE YOU PAID YOUR 2002 DUES?

Please look at your label on the cover of this issue of The Professional Geologist to see if your 2002 Membership Dues have been received. If “2002 DUES NOT RECEIVED” is on your label we have not received your dues as of December 17, 2001. Please contact us if your records show otherwise.

In accordance with Article 8, Section 8.2.1, of the Bylaws, Annual Membership dues are due and payable January 1, 2002. Those Members whose dues are not paid by February 15, 2002, will be suspended.
Note: What happened in California regarding GPS services should be a reminder to other AIPG sections to be aware and act before it becomes time to re-act.

The California Council of Geoscience Organizations (CCGO), which the California Section of AIPG is an active member, is pleased at the response from Department of Consumer Affair’s (DCA) attorney on the Global Positioning System (GPS) issue in which professionals can use GPS in their work. CCGO actively supported the use of GPS data by registered geoscientists, as well as engineers, licensed surveyors and others. A few quotes have been taken out of the DCA letter for AIPG’s members’ review. The entire letter can be viewed at www/ccgo.org.

“This is in response to your request to the Board for Professional Engineers and Land Surveyors (Board) for a legal opinion regarding the applicability of Business and Professions Code section 8726 to emergency regulations recently adopted by the State Water Resources Control Board (SWRCB). Cindi Christenson, the Board’s executive officer, requested (the DCA) to respond to (the) inquiry. Specifically, (the) question is as follows:

“Question: Does the collection of information required by emergency regulations adopted by SWRCB (California Code of Regs. §§ 2729-2729.1) constitute "land surveying," as the term is defined in section 8726 of the Business and Profession Code, and therefore require a license issued by the Board?

“Conclusion: The collection of information related to the exact location of ground water monitoring wells, required by Title 12,California Code of Regs. §§ 2729-2729.1, constitutes "land surveying," as the term is defined in section 8726 of the Business and Profession Code and requires a license issued by the Board unless an exemption from licensure applies. Among the statutory exemptions are the following:

“Civil engineers registered prior to January 1, 1982. (Bus. & Prof. Code§ 8731.) To the extent that a survey can be characterized as being made "exclusively for geological" purposes and do not involve the determination of any property lines, such surveying does not fall within the meaning of the Professional Land Surveyors’ Act and may be performed by registered geologists or others persons authorized to practice geology, such as civil engineers. (Bus. & Prof. Code§§ 8727 and 7838.)

“(DCA is) not aware of any restriction on use of the "tools" typically used by land surveyors. For instance, the simple use of new GPS technology is not restricted to any one licensed occupation, however, the use of such equipment for the collection of data for input into GeoTracker does necessitate the responsible charge of a licensed land surveyor, a licensed civil engineer or petroleum engineer, or a licensed geologist. Consequently, the simple use of surveying tools does not require licensure but using the data derived from such tools may require professional judgment (and licensure) depending upon its intended use.”

Again, CCGO is pleased that the use of a tool like GPS can be used by a variety of professionals, including, but not limited to geoscientists, engineers, surveyors, and others. DCA’s ruling benefits and encourages the professions to use newly developed tools, which ultimately benefits the California public.


American Geological Institute Inducts New Officers for 2002

Alexandria, Virginia - The American Geological Institute (AGI) inducted Steven M. Stanley as President for 2002 during its reception and awards ceremony on Tuesday, November 6, at the annual meeting of the Geological Society of America (GSA), an affiliated member society. The ceremony took place from 5:30-7:30 p.m. in the Independence West Ballroom of the Sheraton Boston Hotel in Boston, Massachusetts. He begins a one-year term of office.

The 2002 Executive Committee that Stanley will lead includes: President-Elect M. Ray Thomasson, President of Thomasson Partner Associates, Inc. in Denver; Treasurer Steven L. Veal, CPG-06436, President of DCX Resources, Ltd. in Denver; Secretary-John Steinmetz, State Geologist of Indiana and Director of the Indiana Geological Survey in Bloomington; Member-at-Large Rhea L. Graham, CPG-06858, manager with the New Mexico Interstate Stream Commission in Santa Fe; Member-at-Large Joseph A. Briskey, researcher at the U.S. Geological Survey in Reston, Virginia; Member-at-Large R. Heather Macdonald, Professor of Geology at the College of William and Mary in Williamsburg, Virginia; and Past President Larry D. Woodfork, CPG-02370, Director and State Geologist of the West Virginia Geological and Economic Survey.
Invitation from
The Professional Geologist

TPG is in need of news, articles, commentary, and technical articles of geologic interest.

You are cordially invited to take advantage of the opportunity to use your news journal to publically express your point of view or explain work products related to the science, practice, regulation of, and profession of geology.

Some decry the lack of articles appearing in TPG about one subject or another, or the particular content of an article which is published.

TPG is a service to you as AIPG members. TPG is your news journal. The material that appears in TPG is yours to choose. All the material appearing in TPG is elicited from members. AIPG cannot publish that which is not available.

Please consider submitting a thought provoking or informative article relating to your chosen profession or to the political issues that affect the profession.

R.S.V.P.

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First, our section has substantially completed a census of geologists in Ohio, not only for general information and recruiting purposes for our section, but also to help us with our registration effort and simply to better serve the professional geologists (AIPG and otherwise) in our state. We believe this will greatly assist us now and for years to come. Perhaps this exercise also would be beneficial to other states. Secondly, the Ohio Section is continuing its effort to work with and mentor our first student chapter at Wright State University in Dayton. This chapter is now several years old and is quite active and enthusiastic. We also are beginning to coordinate with very interested geology students and faculty at Ohio State University for the startup of a student chapter in Columbus. The Ohio Section hopes to add several other student chapters (i.e., in addition to Ohio State) over the next few years. We believe that student chapters are vital to the current and future health of our section. Such an effort would likely benefit many sections. Next, our section is fairly well along in developing a strategic plan that, when completed, we believe will greatly assist us in our continuing development and growth, in providing a wide range of support to the geologists in our state, and in promoting our science. The Ohio Section believes that this task of focusing thoughts, energy, and action, although arduous, time consuming, and, at times, frustrating, will prove to be a very worthwhile effort. We suspect that other sections have already or will eventually reach the same conclusion. The successful completion and practical implementation of such long-range/big picture plans is, without a doubt, essential to the present health and successful future of every section. Finally, we recently updated and significantly enhanced our web site in order to make it a more effective all-around resource for our section. We believe that this will be an invaluable tool for outreach (i.e., to our own members, other professional geologists, students and universities, governments, and the general public) and, eventually, a substantive source of revenue for our section Ohio Section. We would encourage other sections to view our site (www.aipg-ohio.org) for the purpose of both gaining web site ideas and, more generally, to exchange ideas between and learn more about our sections.

In closing, with regard to how National can assist our section (and probably many other sections), it has always been very helpful, both from a practical, how-things-can-be-done standpoint and simply for encouragement, for National to share, in TPG and in other ways, success stories. Such stories, from both National and the other sections, have included in the past and will likely include in the future, those regarding membership advances and recruitment triumphs, state professional registration successes, successful educational initiatives, and general advocacy issues for professional geologists.
Yes, the climate is changing. It changes every year. Sometimes it’s warmer, sometimes it’s cooler, but it is never the same. It is entirely natural for climate to change, cooler and warmer, a little bit or a lot. Do humans have an influence on global climate? Perhaps, but human effect is so small that we probably can never measure it, human additions to atmospheric carbon dioxide notwithstanding.

Why do people worry about small and short term climate changes? Because people relate climate changes to a very short time span. For instance, many people are worried about an apparent warming over the last 10 years, or even over the last 150 years. But Kansas records show that the 1990’s warming was no more, and probably less, than the warming that took place in the 1930s that created the Dust Bowl. That temperature jump was widespread, then our climate cooled for nearly 50 years. A millennia ago, long before the industrial revolution, Vikings colonized Greenland during a 300 year-long warm spell, the Medieval Climate Optimum. Two farming communities prospered on Greenland’s southern coast. Today, this coast is icy. The Vikings were frozen out during the Little Ice Age, which ended only about 1850. During the warm period, wine vineyards flourished in England, now gone because of the cold. Russian and South American climates demonstrate the same changes. China and Japan, however, never got the warming. Typically, climate changes are not uniform around the earth.

What causes climate to change? Many natural dynamic earth processes. Some change the climate over millions of years, such as drifting continents and changing ocean currents. Others change climate over decades, such as individual volcanic eruptions or meteorite impacts. In terms of human history and human life spans, solar activity and earth orbit perturbations are probably the most important climate drivers, followed by volcanic eruptions, ocean cycles (La Nina, El Nino), and short ocean tidal cycles (North Atlantic Oscillation, etc.). The volcanic eruption of Mt. Pinatubo in the Philippines cooled the climate for two years. Human intervention would be at the bottom of the list.

Sun spot cycles correlate with climate changes over the last few hundred years, with nearly 100% correspondence. We finished an 11-year sun spot cycle last fall. I had to use my snow blower in January for the first time in several years.

Computer models are not information. They are scientists’ ideas set to mathematical music. Real information is what we can actually measure. What we measure does not indicate a significant human contribution to present climate change.

We are coming out of the Little Ice Age, and we should expect that it would get somewhat warmer, and appreciate it. It is, and we do.

Despite short term up and downs of climate, the unfortunate truth is that the climate is cooling in the long term, over the last 8,000 years, and we are likely to sometime return to the glacial Ice Ages. The usual gap between major glacial ages has been about 10,000 to 11,000 years. We are now at over 10,000 years since the last glacial advance. So, while we are likely to see natural episodic warming over the next 200 years, at any time the climate could turn the other direction and slide us into much colder times.

Our society is based on agricultural growth over the last 8,000 years. When the climate turns distinctly colder, how will we feed the world’s people?

Geologists take a longer term view of the world than most, as we should. We routinely work backward through hundreds of thousands and millions of years. Placing human history in the appropriate earth process setting eliminates much human effect on the Earth. We may be important, but Earth processes are largely independent of human intervention. The vast amounts of energy in our natural systems still greatly outweigh our puny attempts to control nature. We should continue our efforts to minimize our waste products, but be careful to insure that benefits exceed costs.

Natural climate variability overshadows any human climate effect. We cannot control climate except by controlling the sun, the earth’s orbit, and the dynamic processes that drive continents and oceans.

Science operates by advancing ideas, then trying to disprove them. In geology, during the early 1900’s the idea of drifting continents was proposed, but never accepted until the mid-1960’s, when new oceanographic data eliminated objections to the concept. Thus, we test hypotheses of human influence on the earth. Some have validity, others do not. Human control of Earth’s climate does not appear to be valid.

Dr. Lee C. Gerhard, Kansas Geological Survey 1930 Constant Avenue, Lawrence, Kansas 66047.
Damage to Buildings Near World Trade Center Towers Caused by Falling Debris and Air Pressure Wave, Not Ground Shaking, Seismologists Report

WASHINGTON - On September 11, seismographs operated by Columbia University's Lamont-Doherty Earth Observatory in Palisades, New York, recorded seismic signals produced by the impacts of the two aircraft hitting the Twin Towers of the World Trade Center and the subsequent collapse of the 110 story towers. While the ground shaking was consistent with the energy released by small earthquakes, it was not sufficient to cause the collapse of, or damage to, surrounding buildings, as some have thought. Rather, seismologists report, the buildings around the Twin Towers were impacted both by the kinetic energy of the falling debris and by the pressure exerted on them by a dust- and particle-laden blast produced by the collapse.

Writing in the November 20 issue of EOS, published by the American Geophysical Union, seismologists from Lamont-Doherty outline the sequence of seismographic recordings from that tragic day. They argue that vibrations recorded on September 11 were of a magnitude believed too low to cause structural damage to buildings, especially in the northeastern United States.

The authors add, however, that because there were no seismographic stations in or even near the World Trade Center, it is impossible to know for sure that the ground-shaking had no effect on neighboring buildings. Ultimately, they say, officials should consider the importance of placing seismographic stations in high density urban areas.

“Our recordings were made at considerable distance,” says Won-Young Kim, who is in charge of seismological network operations for Lamont-Doherty. “However, plans are pending for an Advanced National Seismic System [ANSS] that calls for placing seismic instruments in such urban areas as New York City,” he said. “The tragic events of September 11 show that such instrumentation can serve a purpose that sometimes transcends strict earthquake applications.”

The EOS paper was written by 12 researchers at Lamont, including Kim, Lynn Sykes, Klaus Jacob, Paul Richards, and Arthur Lerner-Lam, director of Columbia's new Center for Hazards and Risk Research. Lerner-Lam explained what happened once the planes hit the World Trade Center and why they resulted in relatively small seismographic readings.

“The energy contained in the amount of fuel combusted was equivalent to the energy released by 240 tons of TNT,” said Lerner-Lam. “This energy was absorbed by the buildings and produced the observed fireballs, but did not immediately cause the collapse. During the collapse, most of the energy of the falling debris was absorbed by the towers and the neighboring structures, converting them into rubble and dust or causing other damage, but not causing significant ground shaking.”

Seismographic recordings of the WTC tower collapses were made in five states, as far away as 428 kilometers [266 miles] in Lisbon, New Hampshire. Lamont's home station, in Palisades, New York, is located above the Hudson River, 34 kilometers [21 miles] from downtown Manhattan, where the towers stood.

The aircraft impacts registered local magnitude (ML) 0.9 and 0.7, indicating minimal earth shaking as a result. The subsequent collapse of the towers, on the contrary, registered magnitudes of 2.1 and 2.3, comparable to the small earthquake that had occurred beneath the east side of Manhattan on January 17, 2001. The Lamont seismographs established the following timeline:

- 8:46:26 a.m. EDT [1240 UTC] - Aircraft impact - north tower - Magnitude 0.9
- 9:02:54 a.m. EDT [1302 UTC] - Aircraft impact - south tower - Magnitude 0.7
- 9:59:04 a.m. EDT [1359 UTC] - Collapse - south tower - Magnitude 2.1
- 10:28:31 a.m. EDT [1428 UTC] - Collapse - north tower - Magnitude 2.3

In addition, the seismic waves were short-period surface waves, traveling within the upper few kilometers [miles] of the Earth's crust. They were caused by the interaction between the ground and the building foundations, which transmitted the energy from the impacts and collapses.

The authors also noted that, as seen in television images, the fall of the towers was similar to a pyroclastic flow down a volcano, where hot dust and chunks of material descend at high temperatures. The collapse of the WTC generated such a flow, though without the high temperatures.

The Lamont-Doherty Earth Observatory operates 34 seismographic stations in the northeast in collaboration with several institutions. Network operations are supported by the U.S. Geological Survey. The network is part of the Advanced National Seismic System, a national seismological monitoring initiative being implemented through a USGS-university partnership.

AGU Release No. 01-28
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Geoscientists sea to sea

With the passage in May of the Geologists Act in Quebec, the introduction of the new Engineering and Geoscience Professions Act in Nova Scotia, and this month’s announcement of regulations under the Professional Geoscientists Act in Ontario, the last few pieces are falling into the jigsaw puzzle of geoscientist registration in Canada.

This newspaper has consistently supported registration for a number of reasons. A recognized geoscience profession is one of the essentials of an efficient capital market in the mining industry. A system that ensures that earth science is done by qualified and experienced people is an important guarantor of public safety and public welfare, as well as a safeguard for the environment. And a body of people that chooses to submit itself to codes of conduct and professional practice is infinitely preferable to a tangle of regulations and the wet blanket of government oversight.

That Ontario and Quebec—the two most populous provinces, with the two senior stock exchanges—should have been among the last to pass these laws is unusual and a little embarrassing. Geoscientists in Quebec first approached the provincial government for inclusion in the Board of Professions in 1973; rebuffed at least three times by the Order of Engineers, the Association of Professional Geologists and Geophysicists of Quebec has at last been granted status under the Professions Code.

In Ontario, the Association of Geoscientists of Ontario had a long mating dance with the Professional Engineers of Ontario that ended badly in 1998. The result stood in stark contrast to the experience in every other province, where professional engineering bodies (perhaps more conscious of their own relationship with the resource industries) welcomed the opportunity to build an umbrella organization that included geoscientists.

Much of the political will that made the Ontario and Quebec registration acts happen came from well-received reports of Ontario’s Mining Standards Task Force and Quebec’s Study Committee on Financing, set up by each province’s securities commission and major stock exchange. Both the regulators and the exchanges were rightly concerned to bolster their own credibility after the excesses we saw during the mineral exploration boom of the late 1990s.

The central recommendation of both reports, the designation of a “Qualified Person” for disclosures that go to the capital markets, could not work unless geoscientists were registered. Governments, once their minds were concentrated, found that to be a workable and uncontroversial measure, easily accepted by all political parties. And to the ordinary voter—or at least any voter who happened to be aware of the issue—the promise of having a responsible, self-regulating profession in the resource, construction, and environmental-protection industries played well.

But the industry cannot imagine that professional responsibility will stop at registration acts and the distribution of rubber stamps. There will have to be consistent application of the principles and spirit of self-regulation in order for venture capital to take mineral exploration seriously as an investment.

Most specifically, the legal burden placed on the Qualified Person will not relieve boards of directors of their own responsibilities under existing principles of corporate governance. And investment houses may find their clients demanding they take more legal responsibility in recommendations and in portfolio management.

That will mean that not just geoscientists and engineers, but everyone involved in the capital markets, will have to understand that professionalism matters, and that following National Instruments and task force recommendations is more than a matter of watching someone else tick boxes on a form.
Incoming

Lawrence A. Cerrillo, CPG-02763

For those with a military background this is probably not a good heading during these times, but incoming I am. I want to express my appreciation and extend thanks to Bob Fakundiny and the 2001 Executive Committee for the groundwork they established. There are many programs to initiate and issues to resolve, but we have a jump-start for 2002. In this, my first missile-or-epistle or whatever, I would like to reiterate some of the objectives of the brainstorming that resulted from Bob’s session back in January 2000. Some of these may sound familiar on the surface, but the impetus behind them has taken on renewed force. Three areas that were identified as requiring immediate attention are:

1. Improved and reinvigorated direct services to the membership,
2. Development of new sources of revenue, and
3. Increase in membership.

Fourteen additional services to members were identified for consideration, six additional sources of revenue, and 18 ideas were generated for increasing membership. All are worthy goals, and WE should work toward implementing them. Committees have been formed and we will be hearing from them in these pages in near future.

Remember it is not headquarters job to make things happen, it is our job. It will take all of us doing a small part in our respective sections. Think of your section as state or local government, and headquarters as the Federal government—well maybe not quite so drastic. Headquarters, with three people (3 and ¾ at this writing, Cathy O’Keefe is expecting anytime), does a lot for us, but the real implementation of goals must occur within each and every section.

Our membership will grow and be active only to the extent that each section is active. It is not just “what is AIPG doing for me,” but “what is AIPG doing.” People are attracted to and want to belong to organizations that are doing stuff. What it is doing can only be identified from what is happening within each section. Not in any particular order, but for consideration, does your section have:

- A legislative reception for educating legislators on the benefits geologists bring to the economy of the state,
- A student career day to help geology majors know what is going on in the industry,
- A speakers bureau that gets out to the K-12 and the Universities to talk-up geology,
- Someone in the section that could contribute to TPG each month,
- A posting of job openings or jobs needed in your local newsletter or for publication in TPG for that matter,
- An annual picnic or gathering for members, spouses, and families,
- A poster session for students, and
- Other activities that you have found beneficial to members that you could share with other sections.

Do some brainstorming in your section! Let’s turn the phrase “have a nice day” into Make it a Great Day! Let’s make it a great year and build on the work of our predecessors to get the profession of geology the recognition it deserves. Let’s start by MAKING it a great day, being kind to others, and getting fanatical about MAKING things happen!
2002, Another Productive AIPG Year in the Making

William J. Siok, CPG-04773

It's appropriate to start 2002 by again thanking all AIPG volunteers. AIPG Volunteers can never, in my estimation, be given sufficient recognition. An attempt to list all those who serve AIPG would fill many pages. Each year dedicated members serve as Section Executive Committee Members, Section Officers, National Executive Committee Officers and Advisory Board Representatives, ad hoc and standing committee members, and Task Force members. It is impossible for AIPG to accomplish anything of significance, for AIPG or the profession, without member volunteers. AIPG had a very successful 2001 thanks largely to member volunteers.

AIPG's success is measured by its effectiveness as an advocate for the entire profession and as an organization focused on ethical practice and continuing professional development. The focal points for AIPG are advocacy, ethics in practice, and continuing professional development. AIPG efforts during 2002 will be even more sharply focused upon activities to increase AIPG visibility and credibility in arenas where successful pursuit of these issues is most likely to benefit both the practicing geologist and the public.

In 2002, two major AIPG advocacy activities will include the annual springtime pilgrimage to Washington, D.C. for the Fly-In and exhibiting at the annual National Conference of State Legislators (NCSL). The Fly-In is scheduled for early May and NCSL will be held in Denver July 22 through 28. All AIPG members who have a genuine interest in the future role of geology in our national and state economies and development are encouraged to make a commitment to participating in both of these events. Through the years, AIPG has been able to develop increasing recognition among federal and state legislators, their staffs, and agency directors and staff. The professional and personal relationships that have been forged transcend political cycles in many cases, and AIPG volunteer members have been instrumental in helping to create these ties.

It's an encouraging development too, that although some AIPG Sections are not particularly active, the majority are. Many are actively engaged in either promoting geologist registration or working to ensure equitable rules and practice requirements. Others, having engaged in successful registration efforts, are now focusing on continuing education for practitioners, monitoring proposed changes in regulations that might impact the ability to practice, supporting educational efforts through scholarships, and formalizing advocacy efforts on the state level with activities such as legislative receptions to provide insight into geologists' work to legislators.

All activities, and only a few are mentioned here, are organized and successfully carried out by AIPG member volunteers. In 2002, as in previous years, these geologists recognize that in donating their time and energy, they in fact enhance their personal knowledge, network of like minded professionals, and sense of pride in their chosen profession.

Best wishes to all for a Happy and Prosperous New Year!
When Congress amended the Safe Drinking Water Act (SDWA) in 1996, it directed the Environmental Protection Agency (EPA) to develop a new standard for arsenic levels in the nation's drinking water. For nearly fifty years the national standard has been set at 50 parts per billion (ppb). Under the amended act, EPA was to establish a $750 million fund for States and Native American Tribes to help meet the revised standard. Several members of Congress have applauded the EPA action, but believe that there needs to be more done to address the issues facing smaller water systems and regions with extremely high levels of naturally occurring arsenic. Bipartisan legislation has been introduced that would provide grants to help meet the revised standard. Senator Harry Reid (D-Nevada), who introduced the Senate version of the legislation (S. 305), praised the new limit, but stated in a press release that “communities will need help if they are to comply with the standard.” S. 305 and its House companion bill, H.R. 1178, introduced by Rep. Jim Gibbons (R-Nevada), would amend the SDWA to establish a $750 million fund for States and Native American Tribes to help provide the needed capital to improve infrastructure and achieve the new 10 ppb standard.

In June 2000, the EPA requested public comments on the four possible options for a revised limit: 3, 5, 10, and 20 ppb. After reviewing the comments and other reports on both the health and cost aspects of decreasing the standard, the EPA announced that it would move forward with the adoption of a 10 ppb national standard. On January 22, 2001, the EPA reported in the Federal Register that the 10 ppb regulation would go into effect starting in March and that water systems would have until 2006 to fully implement the standard. The incoming Bush Administration placed a hold on this announcement, and several other standards, in order to review them and possibly revise them further. As part of the review, the administration commissioned the NRC to do a second study, specifically addressing any new data available that might require any modification in the proposed standard. The study update, which was released in September 2001, noted that the studies in Taiwan and northern Chile used in previous attempts to develop a lower limit for arsenic exposure are adequate to determine health risks—an issue that many groups had in the use of a linear no-threshold model for establishing risks.

RECENT ACTION

As a Halloween gift to the nation, EPA Administrator Christie Todd Whitman announced that the agency would adopt the previously announced revised arsenic standard of 10 ppb, down from the long-standing 50 ppb. Whitman said in her letter to Congress announcing the adoption, “a standard of 10 ppb protects public health based on the best available science and ensures that the cost of the standard is achievable.” The months of review have not changed the implementation date for water systems, which must meet the revised standards by 2006. Several members of Congress have applauded the EPA action, but believe that there needs to be more done to address the issues facing smaller water systems and regions with extremely high levels of naturally occurring arsenic. Bipartisan legislation has been introduced that would provide grants to help meet the revised standard.
mendations that EPA should look at the possibility of setting standards by system size, to help make sure that the cost-benefit ratio is attainable for smaller communities. Testimony by the National Rural Water Association’s representative anticipates dramatically increased water costs in the smaller systems and suggested that Congress work to create a “Sustainability Fund” as an extension of the Drinking Water State Revolving Fund. Some of the witnesses who oppose the 10 ppb standard claimed that the standard was based on policy rather than science.

THE FUTURE

According to a Congressional Research Service report on arsenic, only 753 of the nation’s 54,352 community water systems serve more than 50,000 people. Over 96 percent of the community water systems subject to the EPA action are small systems that service less than 10,000 people. In addition to the funding for the development of cost-effective technologies, the federal government will need to provide technical assistance and training for operators of small systems with the intent of reducing compliance costs. There also will be an effort to assist small communities to maximize grants and loans under the State Revolving Fund and Rural Utilities Service programs. Just because the EPA has announced the adoption of a 10 ppb standard does not mean that the issue of arsenic in drinking water is now off the congressional radar.

LEGISLATIVE ACTIVITIES AFFECTING GEOLOGY (continued)

The Colorado Section of AIPG (CO-AIPG) is hosting its Annual Legislative Reception for our State Legislators on Tuesday, February 5, 2002, from 5 p.m. to 7:30 p.m. The reception will be held at the University Club (1673 Sherman Street) in Denver. CO-AIPG sponsors the reception annually to create an opportunity for geoscientists from industry, academia, and state and federal agencies to meet Colorado legislators. The event is designed to be educational for legislators and is an effective way of introducing them to potential sources of geoscience information for future reference and access. No lobbying on legislation is permitted at this reception.

In addition to providing opportunities for legislators to network with constituents and gather sources of relevant geoscience information, networking also occurs between members of various participating technical societies (past ones include the Assoc. of Engineering Geologists, Colorado Oil and Gas Assoc., Denver International Petroleum Society, Denver Mining Club, Friends of Dinosaur Ridge, Geological Society of America, and Rocky Mountain Assoc. of Geologists). This event provides a stimulating social venue, outside of the typical single-society technical meeting, for geologists and engineers in the area to meet and discuss Colorado issues. Students interested in professional geology careers, jobs, and state issues also have the opportunity to network with many professionals and legislators at this reception, something that is not possible anywhere else in Colorado.

AIPG members, technical societies, and others in the geoscience community can participate in one of several ways: 1) attend as an individual (cost for Professionals is $20.00 prepaid/ $25.00 at the door; for Students, it is $7.00); 2) participate as a Co-Host ($70; includes two paid entrance fees and publicity); or 3) participate as an Exhibitor ($100; includes three paid entrance fees, publicity, and space and table for your exhibit). Exhibits are intended to be educational only and to promote discussions with legislators. They provide attractive, informative, geologic focal points in the reception room, designed to illustrate activities related to the role of geology in the environment and extractive industries, as well as in the economic well-being, health, and/or safety of the citizens of Colorado. Materials that can be viewed, touched, or discussed, such as publications, economic data, maps, models, minerals, rocks, fossils, videos, and computer presentations, are very effective educational tools. The Colorado Geological Survey is a key player and supporter of this event and always has a highly attractive display (both esthetically and in terms of heavy visitation).

Anyone interested in participating in the CO-AIPG Legislative Reception should contact Doug Peters (169 Quaker Street, Golden, CO 80401-5543; 303-279-1540 (voice) or petersdc@petersgeo.com) or Laura Wray (1313 Sherman Street, Room 715, Denver, CO 80203; 303-866-3519 (voice) or laura.wray@state.co.us) before January 26, 2001.
Building remains closed, and many other offices are only partaking in the anthrax scare on Capitol Hill. The Hart Senate Office Building of the end of the year are slim and getting slimmer due to the ongoing process, the prospects for energy legislation passing before the Senate. The Energy Incentives Act (S. 1566) on October 18th to allow public utilities to trade tax credits from energy they produce using renewable energy resources, Sens. Harry Reid (D-NV) and Gordon Smith (R-OR) introduced the Renewable Energy Resources Act. Moving away from oil and gas toward renewable energy resources, Sens. Harry Reid (D-NV) and Gordon Smith (R-OR) introduced the Renewable Energy Resources Act (S. 388) which would allow drilling in the refuge and now includes an energy security measure. The Democratic majority leader, Tom Daschle (D-SD), called on the Senate Energy and Natural Resources Committee to vote on comprehensive energy legislation. Instead, he asked the committee's chairman, Jeff Bingaman (D-NM), to draft an energy bill that would be brought directly to the Senate floor, a move that allowed Daschle to bypass the committee process and shape the bill more directly. Bingaman defended Daschle's move, stating that it was intended to "avoid quarrelsome, divisive votes in committee...and avoid those contentious issues that divide, rather than unite us." But the committee's ranking Republican, Sen. Frank Murkowski (AK) was having none of it, accusing Democrats of ducking a committee vote on the Arctic National Wildlife Refuge (ANWR) that they would lose. The Democratic bill is not expected to contain language that would allow drilling in ANWR. Opening the refuge for exploration remains a top priority of the administration. President Bush has given a number of recent speeches urging the Senate to pass an energy bill that would allow drilling in ANWR, referring to the issue as a matter of national security, because it would reduce the nation's reliance on foreign oil. Bush's statements were echoed by Murkowski and other Senate Republicans whose comprehensive energy bill (S. 388) would allow drilling in the refuge and now includes an energy security measure for federal dams and public lands. Moving away from oil and gas toward renewable energy resources, Sens. Harry Reid (D-NV) and Gordon Smith (R-OR) introduced the Renewable Energy Resources Act (S. 1566) on October 18th to allow public utilities to trade tax credits from energy they produce using renewable energy sources. Even without the committee process, the prospects for energy legislation passing before the end of the year are slim and getting slimmer due to the ongoing anthrax scare on Capitol Hill. The Hart Senate Office Building remains closed, and many other offices are only partially functioning. More on energy policy developments at http://www.agiweb.org/gap/legis107/energy.html.

Geoscience Appropriations Leading the Pack

As reported in an October 17 Action Alert, Congress has passed the fiscal year (FY) 2002 Interior and Related Agencies Appropriations bill, which is awaiting a presidential signature to become law. The conference report passed by wide margins in both the House and the Senate (380-28 and 95-3 votes, respectively). When all was said and done, the U.S. Geological Survey (USGS) received $914 million, more than was provided by either the House or Senate version of the bill and a 12% increase over the president's budget request. The Department of Energy's Fossil Energy programs received close to $583 million, a 30% increase above the budget request. Also on the fast track to being passed is the FY 2002 Energy and Water Appropriations bill, H.R. 2311. On October 31st, the House-Senate Conference Committee released its report (H. Rept. 107-258). Under this version, the Department of Energy's Office of Science is marked to receive $3.2 billion, which would include $1 billion for Basic Energy Science programs. Since the fiscal year began on October 1st, all federal programs are being funded under a series of continuing resolutions, the latest of which extends until November 16th. More at http://www.agiweb.org/gap/legis107/appropsfy2002.html.

Federal Science Leaders on the Move

On October 23rd, the Senate confirmed John Marburger to lead the White House Office of Science and Technology (OSTP). He is the first high-level scientific appointment to make it through the lengthy confirmation process. Marburger, who was the Director of the U.S. Department of Energy's Brookhaven National Laboratory before being nominated, will not only head OSTP but also act as the president's science advisor. On a related note, President Bush announced that he intends to nominate Richard M. Russell to be Associate Director of the Office of Science and Technology Policy. Russell has been serving as Chief of Staff at OSTP, and previously worked on the House Science Committee before leaving to head up the president's transition team for science. More information on Richard Russell is available at http://www.whitehouse.gov/news/releases/2001/10/20011026-13.html. President Bush also announced his intentions to nominate Michael Smith to be the Assistant Secretary for Fossil Energy at the Department of Energy. Smith has a long history of activity related to energy resources and has most recently been serving as the Oklahoma Secretary for Energy. Also announced this month, NASA Administrator Daniel Goldin will step down as head of the agency on November 17th after a nine-year tenure that spanned three administrations, having been appointed by the first President Bush. Goldin made his announcement shortly before the Mars Odyssey probe made a successful entry into orbit and just ahead of a highly critical independent review of the International Space Station. More on Goldin's announcement at ftp://ftp.hq.nasa.gov/pub/pao/pressrel/2001/01-191.txt.
Federal Hardrock Mining Regulations Revised After Delay

In the October 30th Federal Register, the Bureau of Land Management (BLM) released the final rules for hardrock mining on federal lands, commonly referred to as the 3809 regulations. Originally prepared during the Clinton Administration, the new regulations were delayed several years by provisions added to annual appropriations bills. In the last days of the Clinton administration, the revised regulations were finally announced only to be shelved again by the incoming Bush Administration for review and further consideration. Now that the current administration has reviewed and modified the regulations, the final 3809 rules will take effect on December 31, 2001. A Clinton revision that would have allowed the Secretary of the Interior to block projects that pose “substantial irreparable harm to significant scientific, cultural, or environmental resources” has been removed in the final version. The new revisions would maintain the Clinton-era bonding regulations and regulations regarding the use of cyanide in mining gold deposits. More at http://www.agiweb.org/gap/legis107/mining.html.

House Bill Addresses Fossils on Public Lands

October saw the introduction of new legislation intended to protect paleontological resources on federal lands. The Paleontological Resources Preservation Act, H.R. 2974, was introduced by Rep. James P. McGovern (D-MA) on October 2nd, and immediately referred to the House Committee on Resources where it was subsequently referred to three subcommittees. According to McGovern, the bill is designed to establish a unified policy for federal land management agencies to encourage stewardship of paleontological resources on federal lands. The bill is based on recommendations contained in a report issued last year by the Department of the Interior. More at http://www.agiweb.org/gap/legis107/fossils.html.

EPA Adopts New Arsenic Limits

Environmental Protection Agency (EPA) Administrator Christie Todd Whitman announced on Halloween that her agency would adopt a new limit for arsenic in drinking water of 10 parts per billion (ppb), down from the current 50 ppb. The new limit was originally proposed by the Clinton Administration in January, suspended by the Bush Administration in March, and, now officially reinstated in a letter from Whitman to Congress. Environmental groups pushed for an even tighter standard of 3 ppb, while many business and mining groups opposed the stricter arsenic limits, because of the high costs anticipated for small water systems. Senate Majority Leader Tom Daschle (D-SD) and House Science Committee Chairman Sherwood Boehlert (D-TX) praised Whitman’s decision, calling it “a victory for the health of American families” and “a reasonable compromise,” respectively. The new standard will be met by 2006 with the aid of $20 million in earmarked funds to develop more cost-effective technologies for small towns to meet the standard. EPA’s decision followed an October 4th hearing held by the House Science Subcommittee on Environment, Technology and Standards on three reports recently submitted to the Environmental Protection Agency (EPA) that update the state of knowledge on the science, benefits, and cost of regulating arsenic in drinking water. More at http://www.agiweb.org/gap/legis107/drink_water.html.

Pennsylvania Restores Evolution in Standards; U.S. Senate Resolution Still Pending

In Pennsylvania, House and Senate Education Committees have passed regulations to implement new science and technology education standards that include evolution. The new standards do not include language previously inserted by the state board of education, which would have required students to “analyze... studies that support or do not support the theory of evolution” and required teachers to present theories that “do and do not support the theory of evolution.” These requirements were included in draft standards submitted for public comment in April 2001. Many scientific and educational organizations as well as individual concerned Pennsylvanians responded to the call. As a result of public input, the Pennsylvania Department of Education removed the anti-evolution requirements from the final standards. The standards face one final hurdle—a vote by the state’s Independent Regulatory Review Commission.

Meanwhile on Capitol Hill, a Senate resolution introduced by Pennsylvania’s own Sen. Rick Santorum (R) is still being considered as part of a final compromise education bill (H.R. 1). A House-Senate conference committee met most recently on October 31st to work out differences between House and Senate versions. The conference’s work has been slowed considerably in the aftermath of September 11th, but President Bush has continued to press Congress for a final bill. The American Geophysical Union recently sent out an alert to its members urging them to write members of the conference committee. The alert is on the web at http://www.agu.org/cgi-bin/asla/asla-list?read=2001-26.msg. More on this topic at http://www.agiweb.org/gap/legis.html#evolution.

MMS Seeks Comments on Five-Year Outer Continental Shelf Plan

The Minerals Management Service (MMS) announced on October 26th that it has taken the next steps for developing a 5-year plan for outer continental shelf (OCS) oil and gas leases. MMS is required by law to establish and maintain a schedule for lease sales that “best meet[s] national energy needs” for the coming five years. The current plan is due to expire at the end of June 2002. Public comments are sought on both a draft Environmental Impact Statement (EIS) and the second draft of the proposed plan. Under the new program, a total of 20 lease sales in 8 areas would be scheduled: 5 off the coast of Alaska and 3 in the Gulf of Mexico. According to the Federal Register announcement, MMS is most interested in receiving comments “on the size, timing, and location of leasing and the procedures for assuring fair market value” intended in the proposal. As is typical for EIS reports, the draft EIS proposes three alternatives, which includes a “no action alternative.” Public comments on both reports can be made either via mail or email. The MMS website provides both mailing addresses and email addresses for comments and a schedule of public meetings that are scheduled in the next few months. More at http://www.mms.gov/5-year.
Forest Service Provides Plan for Energy Production on Public Lands

As part of President Bush's National Energy Policy proposal, federal agencies were requested to assess energy policy issues under their jurisdiction. The U.S. Forest Service (FS) established an energy group to look at the potential energy resources on FS lands, which released its finding in the "U.S. Forest Service Implementation of National Energy Plan." Divided into topics based on the recommendations in the National Energy Policy report, the implementation plan outlines specific action underway to coordinate with other agencies and programs to develop a comprehensive energy policy for federal lands. According to the report, in the area of fossil fuel and geothermal energy, the FS Minerals and Geology Management program will complete an inventory of these resources and will study the effects of forest planning on energy resources. More at http://www.fs.fed.us/geology.

New Congressional Fellows Attempt to Settle In

Last year’s crop of congressional science fellows faced a turbulent situation as they sought placements on Capitol Hill in the midst of a contested presidential race. But what they experienced was nothing compared with the 39 congressional fellows in this year’s class. The fellows were partway through their orientation, which is run by the American Association for the Advancement of Science, on September 11th. Since that time, they have faced the challenge of seeking placement in the face of anthrax scares, closed office buildings, and myriad other disruptions. AGI fellow David Curtiss chose to work for Rep. J.C. Watts Jr. (R-OK), who chairs the House Republican Conference, putting him fourth in the House Republican leadership. The Republican Conference is an information resource for all Republican representatives on a variety of issues, and Curtiss expects to focus on energy and international issues. Before taking the fellowship, Curtiss was Manager of Program Development and a research scientist at the Energy and Geoscience Institute of the University of Utah. He holds a master’s degree in Earth Resource Management from the University of South Carolina.

AGU fellow Karen Weyland recently received her Ph.D. in environmental geochemistry from Michigan State University. She is working for Senate Assistant Majority Leader Harry Reid (D-NV), replacing Jack Hess, who has served as a Desert Research Institute fellow with Reid for the past year and a half. Jack is the new Geological Society of America Executive Director, and we wish him the best of luck in his new job. GSA/USGS fellow Chester "Skip" Watts is on leave from Radford University where he is a geology professor and director of the Institute for Engineering Geosciences. Phillip Owens will start in January as the Soil Science Society of America's fellow. He is completing his doctorate in soil science at Texas A&M University. Another geoscientist, Ana Unruh, is sponsored by the American Meteorological Society. She is working for Rep. Ed Markey (D-MA). AAAS also oversees a number of fellowships in the executive branch, and one of the new EPA fellows is Steve Gaffield, a hydrologist with the Wisconsin Geological Survey.

Applications for the 2002-2003 AGI Congressional Science Fellowship are due February 1, 2002. For more information on the AGI fellowship and fellowships offered by AGI member societies, please visit http://www.agiweb.org/gapac-csf.html.

AGI Testifies at USGS Listening Session

On October 11th, AGI participated in a listening session held by USGS Director Charles G. “Chip” Groat and his leadership team. The purpose of the session was to receive input from the survey’s customers. Federal agencies, state agencies, and scientific organizations were among the 42 entities giving statements during the all-day session. Participants were asked to base their comments on a series of questions relating to the recommendations of the recent National Research Council report “Future Roles and Opportunities for the U.S. Geological Survey.” The AGI statement is at http://www.agiweb.org/gap/legis107/usgs_listening.html. For more on the NRC report, see http://www.agiweb.org/gap/legis107/nrc_usgsrprt.html.

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:

- Energy Policy Overview (10-26-01)
- High-Level Nuclear Waste Disposal (10-26-01)
- Mining Law and Regulatory Reform (10-25-01)
- Fossils on Public Lands (10-23-01)
- Museums, Fossils and Public Lands (10-23-01)
- Overview of Fiscal Year 2002 Geoscience Appropriations (10-19-01)
- Interior and Related Agencies Appropriations Bill (10-19-01)
- Challenges to the Teaching of Evolution (10-19-01)
- Action Alert: Interior Appropriations Bill Sent to President (Posted: 10-17-01)
- Arctic National Wildlife Refuge (ANWR; 10-17-01)
- Outer Continental Shelf Leasing and Royalties (10-16-01)
- Clean Water Issues (10-15-01)
- Strategic Petroleum Reserve (10-15-01)
- AGI Statement for USGS Listening Session (10-11-01)
- Wetlands Legislation (10-11-01)
- Most Recent Energy Hearing Summaries (10-5-01)
- Reviving the Office of Technology Assessment (by AGI 2000-2001)
- Congressional Science Fellow Katy Makeig; 10/01)

Personal Responsibility: the Foundation of Ethics and Morals

Accepting responsibility for one's actions forms the foundation of moral, conduct, and ethics codes. Although usually not stated explicitly, the idea that one is responsible for one's actions is the predicate for consideration of moral and ethical actions. Bernard Gert, in his Morality, Its Nature and Justification (1998, Oxford University Press), carefully notes that moral conduct is required only of rational persons. We do not hold children or adults with impaired mental capacity to the same moral and ethical standards as normally functioning adults. All others are considered to be rational persons.

Professional conduct codes, certification, licensing, and similar programs likewise assume that the professionals to whom such programs apply should be held responsible for their professional actions. Some programs are more explicit about imposing personal responsibility than others, but it is inherent in all such programs. Participants in such programs are required to have specified education and experience, and are expected to conform to accepted professional practices and conduct. Those who fail to conform to accepted professional practices and conduct are subject to various forms of censure. Censure, when applied, imposes personal responsibility for professional conduct. This potential for censure is one of the hallmarks distinguishing a profession from other forms of activity.

Given the fundamental importance of taking and accepting personal responsibility in moral and ethical conduct, I find it surprising that personal responsibility is so seldom discussed as a first principle. We've been going through a period in which those accused of immoral and unethical conduct attempt to shift the blame from themselves to an abusive upbringing or relationship, or some other social dysfunction, for example, TV programming. Such attempts to shift blame are attempts to deflect personal responsibility. We are surprised, even dumbfounded, when someone accepts personal responsibility. When Attorney General Janet Reno unequivocally accepted responsibility for the government's actions in storming the Branch Davidian compound in Waco, Texas, the news media and the public in general were stunned. We've become so used to blame shifting that we could think of nothing to say.

AIPG's Code of Ethics is no exception to the general observation that personal responsibility is not explicitly stated as a foundational principle, although it is implied. The last sentence of the Preamble notes that ethical responsibility cannot be waived by virtue of employment, delegation of an action to a subordinate, or because compensation was not received for the action. Perhaps the Preamble should be amended to state that responsibility applies to all professional acts. Please contribute your thoughts on the subject.

AusIMM Disciplinary Report

The Australasian Institute of Mining & Metallurgy's Ethics Committee reported on its activity for the first half of 2001 in the August 2001 issue of The AusIMM Bulletin (p. 27). Their actions warrant reporting because they indicate that their approach to unethical conduct is similar to AIPG's. I believe that international professional geologic ethics codes are similar and that similar violations should be result in similar sanctions. The following cases were summarized—"the Committee" in the summaries refers to the AusIMM Ethics Committee.

A member claimed to possess a degree that was not recognized by the university that purportedly granted it. The Committee found that this claim constituted unprofessional conduct and issued a reprimand without publicly naming the member.

In a case in which a member was convicted of a criminal offense, the Committee found that the conviction violated the ethical provision requiring compliance with applicable mineral industry laws and regulations. However, due to the aped period of time between the conviction and representations received from the member, the Committee determined that the name of the member would not be reported.

Other cases involved allegations that were deemed by the Committee to be primarily commercial or legal matters rather than unprofessional conduct.

Review of the summary of AIPG's disciplinary actions on AIPG's web site (under "Ethics") suggests that AIPG has dealt with similar cases in a similar fashion. I am interested in receiving reports of actions taken by other professional societies and geologic licensing board. Please pass along any you know about.
A Challenge to Geoscientist’s Use of GPS and GIS

The copy of the letter from Jim Jacobs, CPG, to the California Board of Geologists and Geophysicists regarding geoscientist’s use of GPS and GIS systems without being licensed as surveyors (Dec’01 TPG, p 18, box), is worth noting. Jacobs points out that sampling location, well, and other observation sites is a fundamental part of geoscience practice and differs from the preparation of maps for real estate and other forms of surveying.

Although AIPG’s Ethics Code and professional ethics codes in general contain provisions stating that those covered by the codes should (1) practice only within their areas of professional competence (Rule 3.3.1), (2) recommend the employment of other professionals as required by the job (Rule 3.3.3), and (3) respect the professionalism and qualifications of others (Canon 4), guild protection urges spring up regularly among the licensed professions. Jacobs’ letter reflects a response to just such a guild protection attempt on the part of licensed surveyors.

Jacobs’ efforts were successful. On November 16, 2001 the Legal Affairs department of the State and Consumer Services Agency issued a letter stating that “To the extent that a survey can be characterized as being made ‘exclusively for geological’ purposes and do not involve the determination of any property lines, such surveying does not fall within the meaning of the Professional Land Surveyors’ Act and may be performed by registered geologists or other persons authorized to practice geology, such as civil engineers (Bus. & Prof. Code §§ 8727 and 7838)."

This particular issue is an example why AIPG is important to all of us on a national, state, and local level. Passage of a licensing bill does not solve all problems. Issues affecting our ability to practice our profession continually crop up at all governmental levels. Active AIPG sections are the best means of ensuring that such issues are promptly identified and addressed.

Active sections require members who do more than pay their dues. Each of us has different talents and interests. My interest in professional ethics exceeds that of most AIPG members. That’s okay; the feedback I receive from you lets me know that the effort is appreciated. Likewise, the “AGI Government Affairs column” in TPG assembled by David Applegate and others reflects another personal interest that is important to us all. Each of us has something to contribute—even those of you who are student and associate members—as a leader or supporter of some program. You will get out of AIPG what you put into it. Help make AIPG a stronger organization by doing things that interest you. By doing so, you will discover the many things that AIPG is doing and can do, for you when we work collectively.

International Qualifications Recognition

A copy of the cooperative agreement between AIPG and the Canadian Council of Professional Geologists appeared on page 34 of the December TPG. On the next page of this issue of TPG is the announcement that CPGs have been accepted as “Qualified Persons” in Canada. These are additional examples of important things that AIPG is doing for its members, particularly those who work internationally. Another example is the Irish recognition of AIPG Certification as an acceptable qualification for filing reports concerning mineral resources and mineral reserves in Ireland. Some members have wondered what benefits stem from AIPG’s active contact with the European Federation of Geologists and other foreign entities over the years. These are three examples.

As with the ability of geoscientists to use GPS units to locate samples discussed in the preceding section, AIPG does and should act for the benefit of geoscientists in a variety of ways. Although you may not personally practice in a number of states or internationally, many geoscientists do. Also, given the fact that change seems to be the norm in our profession, your professional practice needs may change radically in the not too distant future, and you may then benefit from AIPG’s efforts in ways you do not now.

Laptop Travel Tip

Those of you who have flown with a laptop since September 11th know that you are being required to take the laptop out of its traveling case for separate security screening. You probably also have noticed that laptops look a lot alike so that when two or three come through the screening belts together, getting the correct laptop back takes some careful looking. In order to make my laptop more distinctive, I put AIPG seal stickers on the top and bottom of my laptop. These stickers are handed out at the AIPG booth at meetings and are available from headquarters.

Sponsor A Student Member

To sponsor a student membership, simply complete the form on page 30 of this issue, 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.
BOOK REVIEW

The Dinosaur Hunters
(Note: The U.S. title is Terrible Lizard: The First Dinosaur Hunters and the Birth of a New Science)

Review by Gareth Ll. Jones, AS-0010

I started reading this well-illustrated paperback as a micropaleontologist with a general interest in larger fossils. However, I very soon became totally enthralled by the story of fossil discoveries in Lyme Regis and elsewhere in the UK, which were inextricably linked with the birth of the science of geology in the nineteenth century.

Cadbury portrays the characters with great sympathy and amazingly interesting detail, derived from her very thorough research. These include Mary Anning, the impoverished local fossil collector who found the first Ichthyosaur, and Gideon Mantell, the doctor who became obsessed with collecting and understanding the meaning of these giant bones interred in solid rock.

She shows how the new “undergroundology” of the Rev. William Buckland evolved as he and his fellow enthusiasts unravelled the sequence of the rocks. At the same time they also were trying to reconcile their discoveries with the words of the Bible, but the more they discovered, the more difficult it became! Their understanding advanced until it finally culminated in Charles Darwin’s Theory of Evolution, which was thrust upon a Society whose minds were constantly being prised open in many new ways.

Interwoven with the story of scientific progress is the picture of a class-ridden society and of bitter rivalries. None was greater than those of Richard Owen, the anatomist, zoologist and advisor of the Prince Consort, in his relentless upward progress. His cunning and vicious campaigns were especially directed against Gideon Mantell, in spite of the support of friends such as Charles Lyell and Prof. Silliman of Yale University.

This is a thoroughly absorbing and fascinating read, which combines good science and sympathetic character portraits. I highly recommend it and I have no caveats.

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in
RENO-LAKE TAHOE, NEVADA
September 22-29, 2002

“Gambling with Geologic Hazards
and
Dealing with Sustainability

Contacts: Co-Chair: Kel Buchanan (summitcrk@aol.com or 775-786-4515) or Vice Chair: J on Price (jprice@unr.edu or 775-784-6691 extension 126)

CPGs Accepted as “Qualified Persons” in CANADA

On October 19, 2001 the Canadian Securities Administrators (CSA) issued a notice accepting AIPG certification as meeting the professional association membership criteria for a Qualified Person as defined in National Instrument 43-101, the new Canadian rules for reporting mineral resources and ore reserves. Acceptance of AIPG certification resolves a major uncertainty for U.S. economic geologists involved in mineral resource and reserve estimation. Item 2.1 of Staff Notice 43-302, Frequently Asked Questions about National Instrument 43-101 (NI43-101), specifically addresses the issue of how an individual can meet the “professional association” requirement of the “Qualified Person” definition and includes AIPG CPGs in a list of accepted organizations and groups.

NI 43-101 was developed in response to the 1997 Bre-X scandal and represents a new standard for reporting mineral resources and reserves in Canada that has world-wide impact. Among other requirements, all reports containing estimates of mineral resources and reserves must be prepared or under the supervision of a Qualified Person, who, by being named as such, accepts personal liability for the professional quality of the report and underlying work. A Qualified Person must have at least five years of experience including appropriate experience in the minerals being reported on and must be a member of a “professional association.” The requirement that the professional association “has been given authority or recognition by statute” created uncertainty about which non-Canadian organizations would qualify. The CSA Staff Notice resolves the uncertainty.

Economic geologists should read the other parts of CSA Staff Notice 43-302, which was issued as a 17-page PDF file. Although available through various CSA member websites, finding the Staff Notice is difficult. Therefore a copy has been posted on AIPG’s web site.

AIPG’s contacts with the Canadian Council of Professional Geoscientists (CCPG) and the support of the CCPG in identifying AIPG as acceptable professional association helped in this important recognition of AIPG certification. This is one example of something AIPG has done for an important segment of its membership.
Allen P. Juhás, CPG-06441, has been elected a Henry Krumb Lecturer by the Society for Mining, Metallurgy and Exploration. He will speak on “Implications of Current Trends in the Exploration and Mining Industries.” As part of this lecture series, each year the SME selects prominent minerals professionals to speak on subjects in which they have recognized expertise.

SEG Newsletter, October 2001, No. 47

L.B. Cobb’s, CPG-06391, award-winning mystery novel, Splendor Bay, published by AdvanceBooks, is scheduled for a December 2001 release.

I.C. White Memorial Award
Richard W. Beardsley, CPG-04876

The I.C. White Memorial Award is bestowed annually by the I.C. White Memorial Foundation of the Eastern Section AAPG annual meeting Honors and Awards Ceremony. It is given “in recognition of the recipient’s outstanding contributions to expanding our knowledge of the Appalachian basin geology. This year’s recipient is Richard W. Beardsley, CPG-04876.

Dick Beardsley began his commitment to the study of geosciences at Penn State University, where he was Marshall of the College of Earth and Mineral Sciences. After graduating in 1969, he worked for Chevron Geophysical in Houston, Texas, through 1972. He returned to the Appalachian Basin in 1973 to work as an exploration geophysicist for Columbia Gas. In 1989, Dick was elected Vice President of Geology and Geophysics for Columbia Natural Resources, where he advanced an aggressive agenda of exploration and mapping of the Appalachian Basin. He retired from Columbia in March 2001 and became an officer and member of Triana Energy, a company formed exclusively to pursue new exploration targets in the Appalachian Basin.

Dick has published numerous academic papers on the geology of the Appalachian Basin and is a frequent speaker at regional technical conferences. Some of the articles he authored or collaborated on include the following:

- Structural Controls on Late Cambrian and Early Ordovician Sedimentation in Eastern Kentucky, American Journal of Science.
- Structural Geology and Tectonics of the Appalachian Plateau, Geology of Pennsylvania.
- Seismic Analysis of a Pre-Alleghanian Dome and Associated Basement Structures in the central Appalachian Plateau Province of West Virginia, Masters Thesis.

Dick is broadly recognized for his extraordinary vision and contribution to the exploration of the traditionally underestimated Appalachian Basin. He is responsible for the identification of each of the first four major Trenton-Black River discoveries made in recent years in Appalachia. His persistence and exceptional success has spurred a revival in the Basin that has attracted numerous new investors and expanded interest in exploration activity all across the region.

Dick is a certification professional geologist and an active member of several professional associations, including AAPG, AGS, SEG, and AIPG. He has mentored a generation of new geoscientists in the region and has served on the defense committee for several doctoral dissertations.

While he is respected and admired by his co-workers and peers for his professional accomplishments, Dick is loved by his community for the many humanitarian acts for which he is commonly known.

He now resides in Charleston, West Virginia with his wife of 31 years, June, and their three children, Elisabeth, Andrew, and Kathryn and two dogs.

Citationist: W. Henry Harmon

Letters to the Editor

Dear Editor:

I am pleased that, in the October issue of The Professional Geologist, President Roger Fakundiny has questioned the appropriateness of certain AIPG position statements concerning mineral resources and the adequacy of current levels of enforcement of Federal and State laws, and that the Executive Committee of the AIPG has postponed the adoption of several policy statements on natural resources and land-use planning, pending reexamination of the position statements. President Fakundiny’s discussion of the statements lead me to believe that they deserve extensive revision.

I expect that it would be impossible to formulate a policy statement or position statement in such a way as to please all members of the AIPG. However, I suggest that so far as possible the following principles should apply to the formulation of a statement.

The issue addressed in a statement should be one to which the profession of geology is particularly pertinent. Geology is particularly pertinent to the issues regarding the development of energy universally. For example, geology has almost no pertinence to the development of power from wind or biomass sources and only indirect pertinence to the development of hydro-electric or nuclear power.

The statement should recognize, at least implicitly, limitations to the pertinence of the profession of geology to the issue addressed. Even if geology is particularly pertinent, other physical sciences, engineering, and social sciences may be expected to have a significant pertinence. I cannot conceive of an issue that would be of concern to the AIPG that would not involve economics and some branch of engineering. Even the investigation of the feasibility of mineral-resource development may involve the issue of access to lands that is likely to involve biological detriments of various sorts, as well as erosion that may be considered a geological detriment, but one...
LETTERS TO THE EDITOR (continued)

on which few AIPG members are likely to have special expertise. The implications of the information from any discipline with respect to the issue should be given no more weight than the certainty of the information deserves. I cannot imagine an issue of any significance that does not involve esthetic and ethical aspects to which scientific expertise has no pertinence.

The statement should recognize, and in most cases distinguish between, short- and long-term aspects of the issue. The results of evaluation of the merits and demerits of development of a mineral resource, including fossil fuels, are likely to be quite different depending on the distance into the future taken into account.

Geologists often have appropriate reason to object to the establishment of policies and the undertaking of programs involving issues to which geology is particularly pertinent, but geologic expertise has not been taken into account. As a professional organization, AIPG should feel obligated to bring geologic expertise to bear on such issues. However, exaggeration of the pertinence or trustworthiness of such expertise is quite likely to weaken the effectiveness of AIPG statements on such issues.

Doak C. Cox, CPG-000182
Honolulu, Hawaii

Dear Editor:

There once was a West that was free,
And it stood for both you and for me.
Then the government moved in,
Passed laws for fur and fin,
’Til there’s no place for us left to pee.

The above limerick was written about 25 years ago, when the Mineral Institute came out with their list of 62 laws (some 30,000 pages) affecting exploration. It now appears that ‘Geology’ should be substituted for the word ‘West’ as I peruse the list found on page 12, Vol. 38, No. 11.

I must admit, in my 50 years of exploration, I have pursued my science in many of those states listed, both successfully and unsuccessfully. This occurred in an atmosphere of individual freedom, (once protected by the Constitution), without the collapse of the state or individuals, and even without a scrap of paper issued by some questionable authority.

The ‘new age’ have completely missed the real meaning of being a geologist. Whereas, the definition of geology, in itself, defines an area of limitless studies, from the cosmos to the microscope. I am appalled at those who seek to destroy this subtle freedom, this knowledge to explore wherever the creative human mind takes us.

One may ask, “Why destroy one of the last vestiges of this concept of a freedom?” For those enamored with a protection concept, or the safety of the public (An Act), I would suggest you look up the word ‘disasters’ on Google, on the Internet. You will undoubtedly come to the conclusion that every bridge failure, building collapse, dam that gave way, levee that leaked, etc., etc., etc., was done, or approved, by a registered engineer (+/- 95%), who was declared “whatever” by “The State.”

Because this registration battle was fought in AIPG in the early years, the results were that Colorado became a leader and passed House Bill 1574 (1973).

In order to further this concept, in 1986, I proposed the setting up of a National Council of Professional Geologists, to be administered by delegates from AIPG, SIPES, and DPA (AAPG). Perhaps if this and other ideas had materialized and matured, then perhaps ugly Page 12, could have been a beautiful picture of rocks?

One can only compliment the AIPG for surviving these many years, considering all of the near misses and problems of a magnitude that many of us will never know.

As Forrest Gump said, “Well, that’s about all I want to say about that!” To all the Union members, I can only say, “Smile on your way to the ovens, and may your journey be fast!”

Graham R. Curtis, CPG-02510
Lakewood, Colorado

Dear Editor:

Michelle Williams should be commended for her brief, yet thorough and objective account of the current debate over opening ANWR for oil exploration (November 2001 TPG). It was especially refreshing to read a balanced perspective of the issue in a journal of an association whose members may see significant benefits, if indeed ANWR ever is opened for exploration. The article did an excellent job of highlighting the difficult task of determining technically versus economically recoverable reserves and how groups on both sides of the issue have attempted to spin the numbers to meet their own agendas. Although some may criticize the Bush administration for including exploration in the refuge as part of his national energy plan, at least he has a plan and has put it on the table for debate, which is more than can be said for previous administrations. The focus on our natural resources and how they can and should be used to meet our country’s energy needs has never been sharper. Geologists are and will continue to be at the center of this discussion and this bodes well for the future of our profession.

Tom Clark, CPG-06667
Mahtomedi, Minnesota

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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.

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**President’s Awards**

These awards recognize the best undergraduate and graduate posters presented by students at the AIPG • AEG Annual Meeting. Cash awards and associate memberships in AIPG will be given to deserving students in honor of an AIPG member. The award will be presented in honor of a member who has made significant contributions to the Institute, as chosen by the sitting President of AIPG.

**Graduate category**

1st place, $500 plus AIPG Associate Membership
2nd place, $100 plus AIPG Associate Membership
3rd place, AIPG Associate Membership

**Undergraduate category**

1st place, $250 plus AIPG Associate Membership
2nd place, $50 plus AIPG Associate Membership
3rd place, AIPG Associate Membership
This service is open to AIPG Members as well as non-members. The Professional Services Directory is a 10-month listing offering experience and expertise in all phases of geology. Prepayment required. Advertising rates are based on a 3 3/8” x 1 3/4” space.

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TPG ARTICLES NEEDED

TPG accepts articles of modest length for publication. Submittals should be no more than approximately 1600 words, or six typed pages, double spaced. Longer articles may be divided into parts (e.g., part 1 and part 2), but this is not encouraged. Articles may be technical or professional in nature. General topics include: mining, petroleum, hydrogeology, environmental geology, and geophysical/engineering. Articles containing news of importance to professional geologists also will be considered. Deadline date for submissions is the fifteenth of the month two months before date of issue. For example, the deadline for the November issue is September 15. Articles are reviewed by at least three associate editors before they are approved for printing.

Manuscripts should have the following sections: title, author(s) with CPG number and address, key words, text if included, figures with captions if included, appendix(es) if included, acknowledgments, references cited, and a brief biography.

One original and three copies of each manuscript should be submitted. Whenever possible, text also should be submitted on diskette. Headquarters uses WordPerfect 9 for Windows '98, which is preferred, but Word, ASCII, RTF, or translatable files are acceptable. Articles also can be transmitted by e-mail.

Graphics should be clear, camera-ready, line drawings whenever possible. Photographs (color or black and white) also are encouraged.

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

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

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Westminster, CO 80031-3681
(303) 412-6205 • Fax (303) 412-6219
aipg@aipg.org or wjd@aipg.org

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The following individuals and corporations have made generous contributions to AIPG through our Sponsorship Program for the enhancement of AIPG’s professional image and to allow improvements in the efficiency of service delivery to all Members.

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AIPG Membership Totals

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AIPG Annual Meetings

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AIPG Scholarship Program IFC
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RockWare, Inc. BC
USGS 11
TYPES OF MEMBERSHIP AND REQUIREMENTS

CERTIFIED PROFESSIONAL GEOLOGIST

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: $110 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: $60 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: $60 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: $50 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.
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 an applicant’s qualifications in regard to these standards, whether that information might be positive or negative, please mail that information to Headquarters within thirty (30) days. This information will be circulated only so far as necessary to process and make decisions on the applications. Negative information regarding an applicant’s qualifications must be specific and supportable; persons who provide information that leads to an application’s rejection may be called as a witness in any resulting appeal action.

Applicants for

Certified Professional Geologist

AK-Thomas R. Barrett
8401 Jupiter Dr., Anchorage AK 99507.
Sponsors: Gerald Williams, Tom Beck, Keith Guyer.

OH-Jeffrey A. DeVaughn
SAIC, 8866 Commons Blvd., Ste. 201, Twinsburg OH 44087.
Sponsors: Kathryn Dominic, E. Joseph Schulteis, Jeffrey Wilson.

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19 Kern Dr., Flanders NJ 07836.

Applicant Upgrading to CPG

IN-Erik B. Melchiorre
Geol/Geography Dept., DePauw Univ., 602 S. College, Julian 211, Greencastle IN 46135.

IN MEMORY

Danny H. Conklin,
CPG-03163, October 31, 2001,
Amarillo, Texas

John Alan Coope,
CPG-08736, August 2001,
Tucson, Arizona

A. Gordon Everett,
CPG-02387, August 2000
Scottsdale, Arizona

A. Gordon Everett,
CPG-02387, passed away in August 2000 after an extended illness. He was a consulting geologist and geochemist whose practice was devoted to applied problems of mineral and petroleum resources development, evaluation of the disposal, transport, and fate of toxic and hazardous wastes, and litigation issues. Prior to 1969, he taught at Ohio State University; subsequently, he served as Deputy Assistant Secretary for Applied Sciences, U.S. Department of the Interior, and as Director, Office of Technical Analysis, U.S. Environmental Protection Agency. After working on the staff of the American Petroleum Institute for three years, Dr. Everett opened his own consulting firm in January 1978. His projects were in the United States, Canada, Mexico, Argentina, and Papua, New Guinea. Dr. Everett received a Bachelor’s degree in Geology from Cornell University in 1959, a Master’s degree in Geochemistry from the University of Texas at Austin in 1968. In between obtaining his Bachelor and Master’s degrees, Dr. Everett served as Research and Development Officer in the U.S. Army, working on the nuclear exploration of mineral fuels. Dr. Everett is survived by his wife, Natalie; daughters, Elizabeth Williams and Virginia Weisletten; and son, William Gordon Everett.