Happy New Year!

It’s the beginning of a new year, a time of renewal for the AEG, and I am honoured and privileged to serve the AEG with its most capable Council members. First of all, I would like to express my thanks, and those of all AEG members, to Nigel Radford, who now stands down from his role as AEG President. Nigel will continue to serve on the Council as AEG’s former President. His efficiency and diplomatic skills were solicited over and over during this past year, and his calm and clear vision of AEG’s position and evolution have secured a bright future for our Association. Many thanks Nigel!

As the first vice president of the AEG, and in line to serve as President in 2003, Steve Amor has already done a tremendous job for the association, both as Chairman of the Symposium Committee and as webmaster for our website. I am relying on his invaluable assistance to enliven the association this year.

One of the highlights of this past year was the 20th International Geochemical Exploration Symposium held in Santiago, Chile. I take this opportunity to express my gratitude on behalf of the AEG to Peter Rogers, Colin Brooks and their team for their remarkable effort in organising this successful symposium. The strong attendance and the very high standard of the technical papers are strong evidence that the AEG is supported by a dynamic scientific research that will influence geochemical exploration practice in years to come.

In 2001, we were able to enjoy the first issues of GEOCHEMISTRY, Exploration, Environment, Analysis, mainly thanks to Gwendy Hall’s work, GEEA’s Editor in Chief. We all agree on the high quality of these publications, which will better position our journal in an increasingly competitive scientific publishing market. The content of the 2002 issues will strengthen the journal’s position, with the publication of the proceedings from the congress that took place in Santiago (Chile). We all need to keep up this effort and ensure that the best papers from our discipline are published in GEEA so that our journal’s future can be assured!

AEG has undergone profound changes during these past few years with the launch of its new scientific journal, and its web site (www.aeg.org), and the review of the association’s statutes. All this has occurred in the context of the current mineral industry crisis that has so strongly affected exploration. Despite these adverse conditions, the AEG has managed to keep its head above water and has found a new impetus thanks to a lively debate amongst the association members.

The first issue of GEEA was dedicated to the geochemistry of acid drainage in abandoned mines, which says a great deal about the ongoing evolution of the AEG. Geochemistry has become a key discipline amongst Earth Sciences and its applications are very far reaching. Our association stands at a junction between a scientific discipline, geochemistry and a significant economic player: the Mineral Industry. Even though it goes without saying that geochemistry has been one of the pillars of mining exploration success over the past decades, it now also plays a key role in environmental management. It appears that AEG is particularly well placed to play a significant role in this field, especially in the evaluation of the mineral industry’s environmental impact. This is an area of significant scientific research and service activities around the world, which involve a very large number of active AEG members. This subject, which has, most recently, been debated by Nigel Radford and others in EXPLORE, will undoubtedly be on our 2002 agenda.

The next International Geochemical Exploration Symposium will be held in 2003 in Dublin. Gerry Stanley and his team are already actively preparing this venue. Until then, our association will focus on other forms of communication. Thanks to the efforts of Beth McClenaghan and Steve Armor, our website is already highly praised. It is not only a valuable tool for our association members, but it is also, and most importantly, our portal to the outside world. We need to keep strengthening its content so it becomes a useful and attractive site for the whole geochemical community, especially for students who often have difficulties...
Geosoft Inc. (Toronto, Canada), Metech Pty Ltd (Perth, Western Australia) sign coop agreement.

Geosoft Inc. is pleased to announce a cooperative agreement with Metech, an Australian software and support services company originating out of Perth, Western Australia. Located in five of the major mining centers of the world, Geosoft is now positioned to provide mineral exploration companies with the technology and support to solve their complete exploration data needs from data acquisition through management and processing to final presentation and reporting.

The goal of this agreement is to develop a complete solution that helps our clients increase the value and ensure the integrity of their geological, geochemical and geophysical data through better management, quality control, analysis, integration and reporting/presentation. We can provide comprehensive and well supported software solutions eliminating the need for dealing with a multitude of suppliers. The combined software suite represents a significant break from previous generations of software - enabling everyone to exchange data and results easily, both within the exploration and regional office and also via the Internet.

The integration of Metech’s aQuire solution with Geosoft’s Oasis montaj, the industry standard environment for geoscientists working with spatial data,
Geosoft acquisition...

addresses the major problem experienced by professionals in the exploration and mining industries - storing and accessing quality technical data.

Geosoft’s CHIMERA, WHOLEPLOT and GEOPHYSICS applications provide the tools for processing and mapping of geochemical, drillhole and geophysical data. The end result is to increase our client’s ability to make knowledgeable and intelligent decisions based on their data.

Geosoft, a software and services company, serves the earth science community through a worldwide network of offices, distributors and Geosoft Plus strategic partners. The company is a global leader in providing one-stop solutions, based on Oasis montaj, for effective decision-making based on large-volume spatial data.

For more information see the Geosoft website at www.geosoft.com or the Metech website at www.metech.com.au.

Past President’s Message

May I start by wishing all members of AEG a Happy, Healthy and Prosperous New Year? The year in which you have honoured me by letting me serve as your president has flown by, and I now hand over the AEG presidency into the capable hands of Philippe Freyssinet. Philippe is head of Environmental Geochemistry at the BRGM in France, and is, I believe, the first French President of AEG. Bon Chance Philippe, I hope the year brings as much pleasure to you as this last one has for me!

And it has been a busy year for AEG! I cannot begin any recap of the year without mentioning the sad passing of our dear friend and AEG Co-founder, Alan Coope. Alan, you will be sadly missed in the ranks of the profession you loved so dearly and served so well. AEG is undertaking two permanent memorials to Alan. Firstly we are coordinating a special volume of GEEA in Alan’s memory to include papers on the geochemistry of the Great Basin. Let’s make this volume really special! Please send papers to Peter Rogers (proger3@attglobal.net) and to Gwenda Hall (ghall@nrcan.gc.ca). Secondly we are starting a memorial fund to allow student scholarships to be allocated in Alan’s memory. Alan was above all a great teacher of the science he loved, and this is a truly fitting memorial to him. There is space for donations to this fund on the membership renewal form recently mailed to you all, and I urge those of you who can to make a donation to this fund.

This past year has seen the very successful launching of our new Journal, Geochemistry: Exploration: Environment: Analysis (GEEA). It looks superb and is already brimming with excellent articles. More of these are always needed and for it to be a success, you (and I), the AEG members for whom the Journal is assembled, must keep the papers rolling in.

EXPLORE, our newsletter, has continued to disseminate fascinating, and sometimes provocative articles to our members under the editorship of Lloyd James. Early in 2002, Lloyd is passing the job over to Mary Doherty. Thanks to you, Lloyd for your efforts, and to Mary for making such a commitment.

Under the care of Steve Amor, the AEG Web Site (www.aeg.org) has expanded continuously over the year and I think we are now getting excellent value from this very important means of communication.

For me a highlight of 2001 was the 20th IGES in Santiago, Chile. Those of us who were lucky enough to attend had a great time, both geochemically and socially. This was certainly the best IGES I have attended, and the AEG’s thanks are due to the Local Organising Committee.

At the start of the year, I set myself a target of getting consensus on a series of changes to the AEG By Laws that would make the Association more relevant to geochemists

continued on page 4
Corporate Sponsorship of Explore

You will have noticed the bright colors in this issue of EXPLORE. This results from a new AEG policy, that allows for the corporate sponsorship of Explore. We are fortunate to have two sponsors for 2002 - Geosoft and Actlabs. With their generous support, all four issues of EXPLORE will be printed with 8 pages of colour, allowing authors of technical articles a venue for presenting geochemical data in color, and providing advertisers with the option of placing colour ads. If you have ever been envious of the rich color presentation of geophysical data, then take advantage of this opportunity and submit articles that present geochemistry the way it should be, in full colour. If you are an advertiser and are interested in being a corporate sponsor, please contact the EXPLORE Business Manager.

Conditions of Corporate Sponsorship

The conditions for the corporate sponsorship of EXPLORE are outlined below. Corporate sponsorship will provide the funds necessary to allow a minimum of 8 pages of colour in two issues per year (minimum of one sponsor), or 8 pages of colour in 4 issues per year (minimum of two sponsors). Pages printed in colour will be used for graphics related to technical articles and for advertisements. Non-corporate sponsors have the option of advertising in black and white or in colour when a colour issue is planned. The conditions of corporate sponsorship of EXPLORE, including the fees and ad rates, are subject to annual review by the AEG Council.

1. Cost: US$3,000 annually (Jan-Dec) with annual renewal in December.
2. If only one corporate sponsor exists, two issues with eight pages of colour will be printed annually.
3. If two corporate sponsors exist, four issues with eight pages of colour will be printed annually.
4. Additional sponsors will allow additional pages of colour to be printed and/or allow the AEG subsidy to be reduced.
5. The colour pages will include the front, inside front, inside back, back, and center 4 pages and will be used for colour advertising and colour graphics related to technical articles.
6. Premium advertising space will be offered to corporate sponsors for the inside front cover, inside back cover, and back. Sponsors may elect to have ad located in center 4 pages to accompany technical article for a given issue. In such a case, premium ad space to be used for other advertisers for that given issue if warranted.
7. Ad placement costs are in addition to the corporate sponsorship fees. Corporate sponsors will pay rate for black and white ads, even if ad is in colour.
8. Non-corporate sponsors that want colour ads have to pay colour ad rate (black and white rate plus 20%) to

Past President's Message...

in all branches of mineral resources, not simply mineral exploration. These changes are to be circulated to the Fellows shortly for their consideration. Membership numbers for the Association are falling steadily, from over 1000 three years ago, to less than 800 now. Obviously the downturn in the exploration and mining industry is partly responsible, but I am sure that these changes to the Association’s constitution will demonstrate that we are relevant to all aspects of geochemistry in the mineral resources area. By the way, voting on these proposed changes, as for the recent Council elections, will be readily available on our web site. At the Council elections, I used the web site to vote, and it was delightfully simple. I recommend that method to all of you in future.

For me the low point of the year is that the mineral exploration industry continues to depress. There are fewer and fewer jobs as large companies abandon exploration (by slashing budgets and staff) and by merging with or taking over each other, with inevitable smaller exploration budgets. For their part, the smaller companies now find it almost impossible to raise capital on the markets. We know the consequences: there will be too few new deposits in the development pipeline to satisfy on-going demand for metals. That appears logical enough, but it seems that corporate thinking is not looking that far ahead. What can we as individuals do? Seemingly not much, the corporate “they” do not seem to listen to individuals. But as shareholders in resource companies we can do a little, by asking at company meetings (AGMs and the like) questions about the alarming decreases in exploration expenditure. If enough shareholder concern is expressed, it will filter through to the boardrooms. We might as well have a go, because no one else seems likely to do it for us. As with politicians and public opinion, so it is with Directors and shareholder opinions.

As I climb down from the soap box, I would like to take this last opportunity to exhort you all to take an active part in AEG. It’s your association, have your say, ask that question that’s been bugging you, put an article in EXPLORE, add a contact to the web site, and look for material for GEEA. Above all try and get your friends and colleagues to join AEG and make it more and more relevant to our truly exciting science. I believe we are on the threshold of major advances in exploration geochemistry, and these will lead to major new mineral discoveries, as well as to better understanding of the movement of metals in the near surface environment. These are exciting times, let’s have fun with our science! Good Luck to all explorers, and thanks for having me as your president.
Memorial Issue GEEA Dedicated to J. Alan Coope

With the untimely passing of J. Alan Coope on August 5th 2001 the Association of Exploration Geochemists and the exploration community as a whole has lost one of the giants of the latter half of the 20th century. The life and times of Alan will be celebrated by family, friends and colleagues who will recall his many contributions to the profession of exploration geochemistry.

Corporate Sponsorships...

place an ad in colour. This will only be available if this issue is planned for colour.
9. A banner will be printed at the bottom of the front page acknowledging the corporate sponsors (normally by printing the sponsors logo).
10. The Table of Contents will be placed on the inside front of each issue.
11. All ads in EXPLORE will have “Paid Advertisement” in small print near the ad.

David Kelley
EXPLORE – Business Manager
Email: dave.kelley@wmc.com.au

On a personal note I was looking forward to renewing my long acquaintance with Alan at the 20th International Geochemical Exploration Symposium in Santiago de Chile this last May. Unfortunately illness intervened.

To celebrate the professional achievements of Alan the Association of Exploration Geochemists has decided to dedicate a Special Issue of Geochemistry, Exploration, Environment and Analysis to his memory. The Special Issue is entitled “Applied Geochemistry and Exploration in the Great Basin of Nevada.”

Potential contributors are cordially invited to submit manuscripts to:

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Tel: 613 828 1222
Fax: 613 828 2567
Email: geaa@compmore.net

Further information can be obtained from:

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RR 4, Shubenacadie, Nova Scotia B0N 2H0, Canada
Tel: 902 261 2692 and in Chile 569 238 9057 (mobile)
Fax: 902 261 2099 and in Chile 562 748 6772
Email: proger3@attglobal.net or chavin@cnova.net
RECENT PAPERS

This list comprises titles that have appeared in major publications since the compilation in EXPLORE Number 113. Journals routinely covered and abbreviations used are as follows: Economic Geology (EG); Geochimica et Cosmochimica Acta (GCA); the USGS Circular (USGS Cir); and Open File Report (USGS OFR); Geological Survey of Canada papers (GSC paper) and Open File Report (GSC OFR); Bulletin of the Canadian Institute of Mining and Metallurgy (CIM Bull.): Transactions of Institute of Mining and Metallurgy, Section B: Applied Earth Sciences (Trans. IMM). Publications less frequently cited are identified in full. Compiled by L. Graham Closs, Department of Geology and Geological Engineering, Colorado School of Mines, Golden, CO 80401-1887, Chairman AEG Bibliography Committee. Please send new references to Dr. Closs, not to EXPLORE.


RECENT PAPERS
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continued on page 8


Paulick, H., Herrmann, W., and Gemmell, J.B., 2001. Alteration of Felsic Volcanics Hosting the Thalanga Massive Sulfide Deposit (Northern Queensland, Australia) and Geochemical Proximity Indicators to Ores. EG 96(5): 1175-1200.


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RECENT PAPERS  
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Gold and Base Metal Exploration in Northern Pakistan

Introduction
Fine and nugget gold has been extracted from the Northern Areas of Pakistan (Fig. 1) for well over 2000 years. This has naturally attracted exploration attention to the region in recent times. A drilling program on the Indus terraces initiated in 1974 by the Pakistan Mineral Development Corporation (PMDC), with the technical assistance of an Austrian based consulting group M/s Austromineral, was unsuccessful. More recently (1992 to 2001) PMDC carried out systematic regional geochemical exploration over an area of some 50,000 km² in the Northern Areas. The primary objective was to define areas with apparent gold and base metal potential on which more detailed investigations might be focussed.

Fig. 1. Location of Northern Areas, Pakistan.

Summary results of this regional survey are presented here.

Location
The survey area is situated between Latitude 34°33" to 37°04"N and Longitude 72°31 to 77°11"E (Fig. 1). It is located in the extreme northern part of Pakistan that is connected via the Karakoram Highway (KKH) with China in the north and other parts of Pakistan in the south. The survey area borders Afghanistan in the N-NE and the Indian controlled portion of Kashmir to the east. Gilgit, which is 610km north from Islamabad by road, is the administrative capital of the Northern Areas.

Topography
The area is occupied by three important mountain ranges that converge in the vicinity of Gilgit; the Hindukush from the west, and the Himalaya and Karakoram from the east. Relief is extremely high. The area includes K2, the second highest mountain in the
world (8611m), and there are six other peaks >8000m elevation. The large Indus River enters the area from the east and turns southward in the central part. The Hunza River joins it from the north and the Gilgit River from the west. About 20% of the area is permanently covered by glaciers and ice sheets. Drainage patterns are dendritic. Temperatures are extreme with temperature as low as –60°C in the winter and as high as 45°C during the summer. The terrain is extremely rugged with slopes as steep as 60° and locally near vertical.

Regional Geology

The Northern Area contains east-west trending mountain ranges with three regional tectonic units. These are from north to south:
1. Karakoram Block which is a part of the Eurasian Plate. Rocks range from Proterozoic to Tertiary and comprise shelf sediments and low to high grade gneisses. The sequence has been intruded by 2-3 phases of the Tertiary calc-alkaline Karakoram batholith.
2. Kohistan – Laddakh Island Arc mainly comprises late Jurassic to Cretaceous tholeiitic to calc-alkaline volcanic rocks.
3. The Indian Plate trends north to south in the form of Haramosh- Nanga Parbat massif. This divides the island-arc into two parts: (1) Kohistian Arc; and (2) Laddakh Arc. In this region the Indian Plate comprises mainly granitic and gneissic rocks. The zone developed in between the obducted Karakoram Block and the subducted Island Arc is generally known as the Main Karakoram Thrust (MKT), whilst the one in between the Island Arc and the Indian Plate is known as the Main Mantle Thrust (MMT). Beside these collisional tectonic zones the Karakoram Block itself has undergone some regional under thrusting.

Sampling & Analysis

Twenty liters of stream sediment was collected at each sample site. After removal of around 70 grams of <80-mesh material by sieving, the remaining sample was subject to pan concentration. The resulting concentrates were pulverized and coned and quartered. Thirty grams of this material was taken for "total" acid digestion. Analysis was carried out by Atomic Absorption Spectrometry after running standard solutions in a local laboratory established with Australian assistance. Three readings were used to obtain average Au, Ag, Cu, Pb, Zn, Ni, Co and Bi value for each sample.

Analytical Results

The analytical results for 2359 <80 mesh stream sediment and 1782 pan concentrate samples are summarized in Table-1. Threshold for each element was determined with the aid of frequency diagrams. Threshold values and the number of anomalous samples so determined together with analytical detection limits are shown in Table-2. Spatial distribution maps for each element has been prepared. Those for <80 mesh copper and pan concentrate gold anomalies are shown in Figure 3 and Figure 2, respectively.

### Table 1

<table>
<thead>
<tr>
<th></th>
<th>Minus 80 mesh samples</th>
<th>Panconcentrate samples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AU</td>
<td>AG</td>
</tr>
<tr>
<td>Count</td>
<td>2359</td>
<td>2359</td>
</tr>
<tr>
<td>Average</td>
<td>0.07</td>
<td>0.97</td>
</tr>
<tr>
<td>Min</td>
<td>0.05</td>
<td>0.5</td>
</tr>
<tr>
<td>Max</td>
<td>2.62</td>
<td>102</td>
</tr>
<tr>
<td>Median</td>
<td>0.05</td>
<td>0.5</td>
</tr>
<tr>
<td>Mode</td>
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<td>0.5</td>
</tr>
<tr>
<td>Stdev</td>
<td>46.28</td>
<td>42.14</td>
</tr>
<tr>
<td>Quartile</td>
<td>0.05</td>
<td>0.5</td>
</tr>
<tr>
<td>Quartile</td>
<td>0.05</td>
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<tr>
<td>Quartile</td>
<td>0.05</td>
<td>0.5</td>
</tr>
<tr>
<td>Quartile</td>
<td>2.62</td>
<td>102</td>
</tr>
</tbody>
</table>

### Table 2

<table>
<thead>
<tr>
<th></th>
<th>Minus 80 mesh samples</th>
<th>Panconcentrate samples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AU</td>
<td>AG</td>
</tr>
<tr>
<td>Detection Limit</td>
<td>0.05</td>
<td>0.5</td>
</tr>
<tr>
<td>Threshold</td>
<td>0.09</td>
<td>2</td>
</tr>
<tr>
<td>No.of anomalous samples</td>
<td>90</td>
<td>23</td>
</tr>
<tr>
<td>Threshold</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>No.of samples</td>
<td>253</td>
<td>105</td>
</tr>
</tbody>
</table>
Gold Source Rocks

Follow-up studies in a number of valleys based on the regional geochemical and field study data have resulted in the location of a number of gold mineralized zones. These have yielded the following gold values:

<table>
<thead>
<tr>
<th>Locality Name</th>
<th>Gold Values (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranthak</td>
<td>0.2 to 11.2</td>
</tr>
<tr>
<td>Satpara</td>
<td>&lt;0.05 to 1.2</td>
</tr>
<tr>
<td>Golo Das</td>
<td>0.2 to 12.0</td>
</tr>
<tr>
<td>Shigri Bala</td>
<td>0.6 to 1.5</td>
</tr>
<tr>
<td>Machulu</td>
<td>0.15 to 6.6</td>
</tr>
<tr>
<td>Bagrot</td>
<td>0.2 to 3.01</td>
</tr>
</tbody>
</table>

The significance of these localities is that they are either very close to the Main Karakoram Thrust zone.
Revised page text:

Diamond Exploration Studies in Glaciated Terrain

GSC research scientists Beth McClenaghan and Bruce Kjarsgaard continued their kimberlite/glacial dispersal studies in the Kirkland Lake-Lake Timiskaming kimberlite fields of northeastern Ontario, Canada this September. Fieldwork consisted of excavating trenches into two kimberlites on the Seed property, and pits down-ice for till sampling. The kimberlites are overlain by 5.5m and 2m, respectively, of till deposited by the Laurentide ice sheet before it retreated from the region approximately 9,000 years ago. The upper surface of the kimberlite is striated, indicating ice flow was towards the south-southwest. Kimberlite, plus till overlying and down-ice of the kimberlites was sampled to determine the mineralogical and geochemical signature of the kimberlite and to document glacial dispersal patterns. Kimberlite boulders from local (‘down-ice’) gravel pits were also collected to determine if the Seed kimberlites are the source of the boulders in these eskers.

Last summer (2000), Beth and Bruce completed a regional till geochemical and kimberlite indicator mineral survey encompassing the known Lake Timiskaming kimberlite field, and an area extending up to 80 km to the south. The basis of this regional study is to provide information on the distribution and extent of glacial dispersal of kimberlite indicator minerals from the known kimberlite fields.

Conclusions
1. Gold occurrences seem to be more concentrated in the Proterozoic rocks of the Karakoram Block and along the MKT.
2. Gold mineralization appears to be in several types of host rocks with different genetic environments.
3. Values of cobalt and nickel are only slightly elevated in the study area.
4. Copper displays remarkable enrichment along and in the vicinity of the MKT.
5. Bismuth anomalies are generally restricted to Laddakh Island Arc rocks.

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Technical Note… continued from Page 13

(MKT), where the presence of metallic mineralization might be expected, or they contain potentially favourable rocks such as meta-volcanics, greenstone complex, high grade and/or carbonaceous schist/gneisses.

Conclusions
1. Gold occurrences seem to be more concentrated in the Proterozoic rocks of the Karakoram Block and along the MKT.
2. Gold mineralization appears to be in several types of host rocks with different genetic environments.
3. Values of cobalt and nickel are only slightly elevated in the study area.
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Principal

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Cu

P

Ba

Zn

Cl

Ca

Sr

Mg

Na

K

Li

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Technical Note…

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A large excavator was used to expose the striated surface of the Seed kimberlite which subcrops beneath 6 m of till.

kimberlites near New Liskeard, and to identify indicator mineral anomalies in till not related to the known kimberlites that warrant further exploration. These GSC till data complement kimberlite indicator mineral data for stream sediments collected in the same region by the Ontario Geological Survey (Allan, 2001). The GSC results were recently released as GSC Open File 4086. This report can be purchased from the Geological Survey of Canada Bookstore, telephone: (613) 995-4342, Email: gsc_bookstore@gsc.nrcan.gc.ca.

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So come on folks, get cracking, write up that study you did last year or even years ago. Someone out there would certainly benefit from your data and your conclusions! Especially us people out there in the Exploration Industry!

For too long we’ve been moaning about our industry being in the doldrums, let’s get out and show we’re scientists, not wimps!!

Put it on paper for GEEA today!

Note from The Editor…

EXPLOR/E is designed to provide an informal forum for the members of our Association. Short to moderate length technical articles on case histories, field and analytical technique developments, reviews, new concepts, etc. are always welcome.

This is also true for news of recent and upcoming exploration and environmental geochemistry meetings and news of individual member movements and activities. If you have something for inclusion in EXPLOR/E, don’t hesitate, send it to the Editor.

As indicated below, the deadlines for each issue are at least 30 days before publication date (e.g. the deadline for the October issue is August 31).

Lloyd James
Email: l-njames@ecentral.com
International, national, and regional meetings of interest to colleagues working in exploration, environmental and other areas of applied geochemistry.


- **February 10-14, 2002, Society for Mining, Metallurgy, and Exploration (SME) annual meeting, Phoenix, AZ. William Wilkinson Jr., Phelps Dodge Mining Co., 2600 N. Central Ave., Phoenix, AZ 85004, (602) 234-6080, Fax: (602) 234-4847. E-mail: wwilkinson@phelpsd.com.

- **March 4-7, GeoProc2002—Geochemical Processes, Bremen, Germany. Information: Horst D. Schulz, +49(0)421-218-3393, fax +49(0)421-218-4321; Astrid Haderle, +49(0)421-218-3950, fax +49(0)421-218-4321.

- **March 10-13, 2002, AAPG Annual Convention and Exhibition, George R. Brown Convention Center, Houston, Texas, by the American Association of Petroleum Geologists. (AAPG Convention Department, 1444 S. Boulder Ave., Tulsa, OK 74119 USA, Phone:800-364-2274 or 918-560-2679 EMail: convene@aapg.org Web: [http://www.aapg.org](http://www.aapg.org))

- **April 7-11, 2002, 223rd ACS Natl. Mtg. Orange County Convention/Civic Center, Orlando, Fla. INFORMATION: ACS Meetings, 1155 16th St., N.W., Washington, D.C. 20036-4899, (800) 227-5558, (202) 872-4396, fax (202) 872-6128, e-mail: natlmtgs@acs.org


Calendar of Events
continued from Page 8


- February 24-26, 2003, Society for Mining, Metallurgy, and Exploration (SME) annual meeting, Cincinnati, OH. Contact: SME (sme@smenet.org). SME, Meetings Dept., P.O. Box 277002, Littleton, CO 80127, 800-763-3132. SME (sme@smenet.org)

- August 29 – September 3, 2003, 21st International Geochemical Exploration Symposium, Dublin Ireland. Contact Eibhlin Doyle, Secretary LOC, Email: eibhlindoyle@gsi.ie


Please check this calendar before scheduling a meeting to avoid overlap problems. Let this column know of your events.

Virginia T. McLemore
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New Mexico Institute of Mining and Technology
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TEL: 505-835-5521
FAX: 505-835-6333
e-mail: ginger@gis.nmt.edu

Prospectors and Developers Convention 2002
Metro Convention Centre, Toronto, Canada

Short Course 2
Improving the odds: Effective exploration geochemistry
Saturday March 9, 9 am-5 pm

To register for this course use the PDAC website:
www.pdac.ca
Organizer:
L. Graham Closs, Colorado School of Mines, Golden, CO, USA

Presenters:
Lynda Bloom, Analytical Solutions, Ltd., Toronto, Canada, Mary E. Doherty, International Geochemical Consultants, LLC., Golden, CO, USA

This one-day short course will review advances in exploration geochemistry and provide guidelines for compliance with recent securities regulation changes. Effective and efficient application of geochemistry can be achieved through: appreciation of available alternatives; knowledgeable selection and application; and systematic and creative interpretation and presentation of results. An assessment of these fundamental principles will be presented in the context of best practices guidelines. Emphasis will also be placed on cost effective surveys.

Topics
- Design of geochemical programs
- Field sampling
- Sample preparation & chemical analysis
- Fire assay procedures, with emphasis on platinum and palladium
- Quality control & quality assurance
- Partial extraction analysis: Principles and available options
- Data management, processing and interpretation

Recent Advances
- Airborne hyperspectral surveys and regional geochemistry, Phoebe Hauff, Spectral International, Denver, USA
- Geochemical data management, quality control, analysis and presentation, Tracey Minton, GeoSoft Europe Ltd., London, UK
- GOCAD and 3D virtual reality visualization, Rob Gordon, Quantec Geosciences, Toronto, Canada
- Weighted sums: A New Brunswick case history, Lynda Bloom, Analytical Solutions Ltd., Toronto, Canada
- Mineral chemistry case history, Mary Doherty, International Geochemical Consultants, Golden, CO, USA

Support Your Organization
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New Members…

To All Voting Members:
Pursuant to Article Two of the Association’s By-Law No.1, names of the following candidates, who have been recommended for membership by the Admissions Committee, are submitted for your consideration. If you have any comments, favorable or unfavorable, on any candidate, you should send them in writing to the Secretary within 60 days of this notice. If no objections are received by that date, these candidates will be declared elected to membership. Please address comments to David B. Smith, Secretary AEG, USGS, Box 25046, MS 973, Denver, CO 80225, USA.

Editors note: Council has decided that all new applicants will receive the journal and newsletter upon application for membership. The process of application to the Nepean office, recommendation by the Admissions Committee, review by the Council, and publication of applicant’s names in the newsletter remains unchanged.

MEMBERS

Eupene, Geoffrey S.
Chief Advisor, Mining
Pt Handal Srisajasa,
Jakarta, INDONESIA

Thomsen, Michael
Director Applied Exploration Systems
Newmont Corp,
Englewood, Colorado, USA

Integrating Data Management

“Integrated Data Management - Oasis montaj and acQuire” Sessions Available During the PDAC and SEG

Geosoft and Metech are pleased to announce two sessions, entitled “Integrated Data Management – Oasis montaj and acQuire”, that will take place in Toronto during the PDAC March 10 - 13, 2002 and in Denver during the SEG April 14 - 16, 2002.

Who should attend?

• Geologists, Geochemists, and Geophysicists looking for a complete solution for working with all types of exploration data from collecting to reporting.

• Geoscientists looking to improve their exploration opportunities through better data management, quality control, analysis, integration and presentation.

• Exploration managers looking for a cost saving end-to-end solution from one provider enabling an easy exchange of data and results.

The presentation will include the following topics:

II. Field Data Capture: Introduction of the new Pocket acQuire
III. Data Management and Synchronization Concepts.
IV. Data Quality Control and Quality Assurance.
V. Metech and Geosoft Partnership Benefits: Link and relationship to Oasis montaj.
VI. Data Visualization and Map Production.

Seating at these events is limited. For details or to reserve a seat, please go to www.geosoft.com/17.

Correction…

Figure 2 on Page 7 of the October issues of EXPLORE (No. 113) was truncated in the printing process. The correct figure is shown below.

Dr. Grigory Abramson, AEG, SEG
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Tel: 61 2 9365 4005, Mobile: 0419 120 842
gr_abramson@yahoo.com
THE ASSOCIATION OF EXPLORATION GEOCHEMISTS
P.O. Box 26099, 72 Robertson Road, Nepean, Ontario K2H 9R0 CANADA
Telephone (613) 828-0199

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January - December 2002

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email: ghall@gsc.nrcan.gc.ca

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Steve Amor, Webmaster
E-mail: SteveAmor@compuserve.com
ALS Chemex Acquires Bondar Clegg

ALS Chemex is pleased to announce that it has acquired the Bondar Clegg laboratory group, effective December 1, 2001.

Bondar Clegg is a major provider of analytical services to the minerals industry, with laboratory facilities in Canada, USA, Mexico and South America. Where there is a direct overlap of Bondar Clegg and ALS Chemex facilities, the facilities will be merged to maximize capacity and breadth of services. As well, the majority of key management and client services staff from both Bondar Clegg and ALS Chemex will be continuing with the new team. We will thus be able to offer continued local access to services backed by strong centralized laboratories and personnel in order to provide high quality and cost effective laboratory services in a timely manner.

To ensure continuity of data, Bondar Clegg and ALS Chemex specific methods and procedures will continue to be offered after the merger of the two laboratory groups and service commitments to all clients will remain intact. We are fully committed to ensuring that it is “business as usual” and that we provide a seamless merger of the two companies.

We are excited by the long-term opportunities for expanding our service levels. Additional resources to respond more immediately with on-site service solutions for the most remote locations and an expanded technical team to continue with research and development projects will allow us to offer more innovative services in the years to come.

Should you require any further information regarding this acquisition and merger, please do not hesitate to contact us (minerals@alschemex.com) or view our website (www.alschemex.com).

We welcome your comments and feedback.

Deadlines for the Next Four Issues of EXPLORE

Contributors's deadlines for the next four issues of EXPLORE are as follows:

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<th>Publication date</th>
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21st IGES
DUBLIN, 2003
29th August to 3rd September, 2003

Preliminary Announcement

- Technical Sessions
- Workshops
- Posters and Trade Exhibition
- Field Visits
- Accompanying Persons Programme
- Social Programme

For additional information please see the AEG Website: http://www.aeg.org

Contact: If you have any questions, suggestions for the Symposium or would like to offer assistance to the Local Organising Committee please contact:

The Secretary LOC - Eibhlin Doyle (e-mail eibhlindoyle@gsi.ie)

The LOC comprises representatives from: the Geological Survey of Ireland; the Geological Survey of Northern Ireland; the Exploration and Mining Division of the Department of the Marine and Natural Resources; the Environmental Protection Agency; the Irish Association for Economic Geology; and the Institution of Mining and Metallurgy.
THE ASSOCIATION OF EXPLORATION GEOCHEMISTS
APPLICATION FOR NON-VOTING MEMBERSHIP*

Please complete the section relevant to the class of membership sought and supply your address on this form.
Mail the completed application, together with annual dues, to the address below.

*Details of requirements and application forms for voting membership (fellowship) can be obtained from the AEG website (http://www.aeg.org) or business office.

---

**MEMBER**

I ______________________________________________ wish to apply for election as a Member of the Association of Exploration Geochemists. I am presently employed by: ________________________________ as a ________________________________.

(employer) (employment title)

I am actively engaged in scientific or technological work related to geochemical exploration and have been so for the past two years. Upon receipt of the Code of Ethics of the Association I will read them and, in the event of being elected a Member, agree to honour and abide by them. Witness my hand this______day of_____________20______.

(Signature of applicant)

---

**STUDENT MEMBER**

I ______________________________________________ wish to apply for election as a Student Member of the Association of Exploration Geochemists. I am presently engaged as a full-time student at _________________________________________________, where I am taking a course in pure or applied science. Upon receipt of the Code of Ethics of the Association and in the event of being elected a Student Member, agree to honour and abide by them. Witness my hand this______day of_____________20______.

(Signature of applicant)

Student status must be verified by a Professor of your institution or a Fellow of the Association of Exploration Geochemists. I certify that the applicant is a full-time student at this institution.

(Signature) (Printed Name and Title)

---

**NAME AND ADDRESS**

(to be completed by all applicants)

Name:________________________________________ Telephone:___________________________

Address:________________________________________ bus:

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________ fax:

___________________________________________________________________________ home:

___________________________________________________________________________ email:

---

**Annual Dues**

All applications must be accompanied by annual dues. Select one or two below:

1  2002 member dues US$  70 ____________
2  2002 student member dues  40 ____________

If you require a receipt, include a self-addressed envelope and add  2 ____________
If your check is not drawn from a U.S.A. or Canadian bank, add  15 ____________

TOTAL ____________

All payments must be in US funds. Payment by check, International Money Order, UNESCO Coupons, International Postal Orders, VISA and Master Card are acceptable. For users of VISA or Master Card, minor variations in your billing may reflect currency exchange rate fluctuations at time of bank transaction.

If you pay by charge card, please provide the following information: type:  Master Card _____  VISA _____

Credit card account number:________________________________________ Expiration date:____________________.

Name:________________________________________ Signature:________________________________________

Please note: Your completed form should be mailed to the Business Office of the Association and will be acknowledged upon receipt. The Admissions Committee reviews all applications and submits recommendations to Council, who will review these recommendations at the next Council Meeting or by correspondence. If no objection is raised the names, addresses and positions of candidates will be listed in the next issue of the Association Newsletter. If after a minimum of 60 days have elapsed following submission of candidate information to the membership no signed letters objecting to candidates admission are received by the Secretary of the Association from any Member, the Candidate shall be deemed elected, subject to the receipt by the Association of payment of required dues. Send completed application, together with annual dues to:

Association of Exploration Geochemists, P.O. Box 26099, 72 Robertson Road, Nepean, Ontario, CANADA K2H 9R0
TEL: (613) 828-0199, FAX: (613) 828-9288, email: aeg@synapse.net
Workshop Program

Friday April 12, Morning
8:30-8:40AM Registration and Coffee
8:40-8:50AM Introduction
8:50-9:00AM Role of Integration in Mineral Exploration
9:00-9:10AM Geophysics - Introduction
9:10-9:30AM Airborne Geophysics
9:30-9:40AM Break - Coffee
9:40-9:50AM Ground Geophysics
9:50-10:00AM Borehole Geophysics
10:00-10:10AM Lunch
10:10-10:20AM Major Co. Perspective on Integration

Friday April 12, Afternoon
1:30-2:30PM Geochemistry – Introduction
2:30-3:30PM Sampling and Landscape Geochemistry
3:30-3:45PM Analytical Services and QA/QC
3:45-4:00PM Selective Extractions
4:00-4:15PM Hydrogeochemistry
4:15-4:30PM Biogeochemistry
4:30-4:45PM Gas Geochemistry
4:45-4:55PM Lithogeochemistry

Friday April 12, Evening
6-7PM Dinner
Petroleum Exploration Perspectives on Integration

Saturday April 13, Morning
8:00-8:10AM Introduction/Logistics/Updates
8:10-8:30AM Junior Company Perspective on Integration
8:30-9:00AM Remote Sensing – Big Picture!
9:00-9:30AM GIS
9:30-10:00AM Visualization Technology
10:00-10:10AM Break - Coffee
10:10-10:30AM Smart Rooms
10:30-11:00AM Remote Sensing – Mineral Mapping
11:00-11:45AM Lunch
11:45-12:45AM Consultant’s Perspective on Integration

Saturday April 13, Afternoon
1:00PM Process of Integration
1:30-2:10PM Case Study 1: Diamonds
2:10-2:30PM Case Study 2: Base Metals
2:30-2:50PM Case Study 3: Uranium
2:50-3:10PM Case Study 4: Porphyry Copper/Skarn
3:10-3:30PM Case Study 5: Gold
3:30-4:30PM Wrap-up
4:30-5:30PM Review and Synthesis
5:30PM Panel Discussion
SEG2002 Pre-Conference Workshop:
“Exploration Technology: Discovery Thru Innovation”

April 12-13, 2002, Denver Colorado, USA
Holiday Inn Conference Center– DIA

Outline:
This two-day workshop will evaluate current exploration technologies and their role in integrated exploration programs, with perspectives from the large, small and junior companies and from the consulting perspective. Exploration geophysics, geochemistry, remote sensing and information technology will be reviewed; successful discoveries based upon integrated exploration will be presented; and a panel will investigate strategies for effective implementation of integration of these technologies into the exploration environment.

This workshop will be of particular interest to exploration managers and senior exploration geologists charged with design and execution of exploration programs.

To Register:  www.seg2002.org
For Information: www.aeg.org

Workshop Organizers:
Graham Closs (Colorado School of Mines, email: lcloss@mines.edu)
Mary E. Doherty (International Geochemical Consultants, LLC, email: MaryEDoherty@earthlink.net)
Ken Witherly (Condor Consulting, Inc., email: ken@condorconsult.com)
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**Growth and decay of microbial biomass in a laboratory experiment**

**Arsenate reduction by Bacillus arsenicobacter**

**Growth on acetate in a chemostat experiment of two strains of microbes, one fast, the other efficient**

**GWB Short Course!**
October 30–31, 2002
Denver, Colorado
(with annual GSA Meeting)

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**Explores**

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**Newsletter for The Association of Exploration Geochemists**

P.O. Box 150991, Lakewood, CO, 80215-0991, USA

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