

Inquiry into greenfields mineral exploration and project development in Victoria

Submission from the Association of Applied Geochemists

The Association of Applied Geochemists (AAG) is an international scientific organisation whose aims and purpose are focussed on advancing the science of geochemistry especially as it relates to the geochemistry of mineral resources, including their exploration, exploitation and environmental impact.

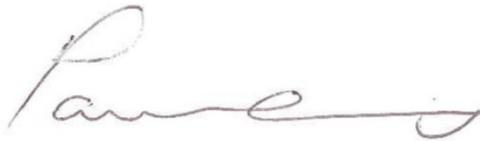
The association has a membership in excess of 500 spread over 50 countries (with about 70% of the membership from the USA, Canada and Australia), consistent with the wide use of applied geochemistry. Membership is drawn from the private sector, government and academia.

Peer-reviewed papers dealing with the research into and application of applied geochemistry are published in the association's journal *Geochemistry: Exploration, Environment, Analysis*. A constant theme in papers published in GEEA is the validation and application of various geochemical techniques to detect mineralization. With the decreasing discovery rate of near-surface or exposed mineral deposits, there has been an increasing emphasis on the application of geochemical techniques to detect deposits buried beneath thick and often exotic cover. These deposits are typically associated with underexplored or **greenfields areas**. The use of applied geochemistry to detect such buried mineralization has been enhanced by the refinement of existing analytical techniques (e.g. inductively-coupled plasma mass spectrometry, or ICP-MS; energy dispersive x-ray fluorescence analysis, or ED-XRF) and the development of new ones (e.g. laser ablation ICP-MS). Thus, a wider range of elements can be accurately and precisely measured to increasingly lower concentrations. Another aspect of these more refined techniques is that more sample media types can be analysed for elements of economic interest, including media that potentially 'see through' the soil blanket that covers buried mineralization (e.g. plants that can tap water that has interacted with buried mineralization; groundwater; termite mounds built of material transported from depth to the surface) can now be utilised.

In the Terms of Reference set by the Parliament of Victoria Economic Development & Infrastructure Committee, item (g) – the roles of government – is probably most closely related to applied geochemistry, in that government agencies are well placed to provide comprehensive geochemical datasets that can be widely utilised by the mineral exploration industry. To this end, the AAG points out that government agencies should:

- Collect appropriate samples and generate multi-element geochemical datasets using techniques capable of precise and accurate determination in areas that are relatively underexplored but have mineral potential
- Generate multi-element datasets, thus ensuring that information can be used to explore for a wide variety of commodities. As metal prices change, mineral exploration emphasis also changes, meaning that multi-element datasets have a long life.
- Continually test and validate the use of different sample media and analytical techniques to search for mineral deposits under thick cover.
- Generate complementary datasets to better understand regional geochemistry. These datasets include information from drilling on depth to the regolith-bedrock interface, and maps showing the distribution of different regolith types

- Compile databases and related web-enabled software applications to facilitate essentially free access to geochemical data that is dynamic – i.e. updated when available. This approach also means that clients' access is not conditional on the ability to pay. The downside of this approach is that cost recovery for the generation of regional geochemical data cannot be reasonably considered.
- Ensure that geochemical data are accompanied by appropriate metadata (e.g. analysis of standards etc) that can be used by clients to determine data quality and whether data are 'fit for purpose'.

A handwritten signature in cursive script, appearing to read "Paul Morris".

(Paul Morris)

President, Association of Applied Geochemists, 2010-11