



CSA Global
Mining Industry Consultants
an ERM Group company



TRAINING OUTLINE

A BETTER UNDERSTANDING OF EXPLORATION GEOCHEMISTRY

This one-day course is designed to help exploration geologists better understand the issues they face when dealing with geochemical data. You will be exposed to practical exercises using ioGAS software to work on real-world datasets.

EXPAND YOUR EXPLORATION CAPABILITY

Multi-element geochemistry is one of the most powerful tools available to an exploration geologist; it is also a tool that many skilled and seasoned practitioners struggle with day to day.

Designing effective geochemical sampling programs, managing large multi-element databases, and correctly interpreting the data are critical disciplines for an exploration geologist to master.

To explore effectively, we must integrate a diverse range of data; but geochemistry is the one dataset that directly identifies (and quantifies) mineralisation. Therefore, it warrants special attention!

Critical issues facing clients when managing and interpreting their geochemical data will be addressed in this course. Although it is not intended as a comprehensive ioGAS training course, participants will gain a working knowledge of this software learning how to use many of its functions.

CSA Global is proud to deliver this one-day training course.

WHO IS THIS COURSE FOR?

This one-day course is designed for moderately to highly experienced exploration geologists who wish to extend their skills in geochemistry.

Knowledge of ioGAS is not required. Our facilitator will work systematically through each exercise, allowing time for note taking by participants.

DELIVERY-MODE

- Our Premises (In-house West Perth) or Your Premises (Onsite).
- This course is presented as a one-day (8 hour) program.

The benefits of studying in a classroom setting include being able to share first-hand experiences, ideas and questions with peers and your expert facilitator. You'll study alongside like-minded people from industry and help to strengthen your network.

LEARNING OUTCOMES

Upon completion of this course, you will have a solid grounding in ten important skills in Exploration Geochemistry.

You will be able to:

- Validate data, and recognise the limitations of that data.
- Use X-Y plots to explore data, validate results of more advanced investigations and link to spatially defined anomalies.
- Identify element associations in your data using Principal Component Analysis.
- Recognise that element associations are scale dependent.
- Break false correlations in your data using Centred Log Ratios.
- Understand the advantages of using probability plots over histograms.
- Construct a log additive index that highlights an anomalous metal association.
- Use alteration geochemistry to better understand the mineralogy of a hydrothermal alteration system.
- Discriminate different rock types using immobile element ratios.
- Apply immobile-incompatible element ratios to define separate magma series (or sediment packages).

ioGAS SKILLS

In this course, you will be shown:

- Data importing and validation
- Attribute Manager; (includes highlighting features on graphs and maps with different colour, shape, and sized symbols)
- Probability Plots
- Histograms
- X-Y Graphs
- Triangular Diagrams
- Attribute Maps
- Ranked Variable Maps
- Custom Spider Plots
- Writing New Calculations
- Using Provided Diagrams and Mineral Compositions: Feldspar Na-K Control Diagram, Volcanic Rock Classification Diagrams
- CLR Transform
- Principal Component Analysis (including graphing Ranked Scaled Eigenvectors in Excel)

AGENDA

Course program

- Introductory Presentation
- Module 1: Importing and Getting the Data Right
- Module 2: Exploring Data with PCA Part 1
- Module 3: Exploring Data with PCA Part 2
- Module 4: Illustrating the problem of Closure
- Module 5: Building a Log Additive Index
- Module 6: Immobile Element Litho-geochemistry
- Module 7: Alteration Geochemistry

By working through Modules 1-7, each of the "Ten Key Lessons in Exploration Geochemistry" will be illustrated using real exploration data.

WHAT'S INCLUDED?

- Course notes with ample space to make your own notes
- Face to face instructor-led training
- Practical exercises and demonstrations using ioGAS (Presenters screen projected up front)
- Data package including training datasets, PCA template, Custom Spiderplot and course slideshow
- FREE software use
- Post course support (1 hour)
- Certificate of Attendance (On request)
- Morning tea, lunch, and afternoon tea (optional)

WHAT DO I REQUIRE?

Your laptop with Windows 7 or higher, including internet connection.

OUR FACILITATOR

Our facilitator is an experienced practitioner with a robust mix of academic and practical expertise.



CARL BRAUHART
PHD MAIG MSEG

Carl is an exploration geologist with over 25 years experience in gold and base-metal exploration, spending much of that time working in frontier areas of Western Australia on grassroots projects.

He has a particular interest in exploration and ore deposit geochemistry, and a passion for field work, particularly mapping. Carl has maintained a close association with the Centre for Exploration Targeting at the University of Western Australia where he is the lead researcher on the OSNACA Project (an ore deposit geochemistry research effort).

During his time at CSA Global, Carl has undertaken fieldwork across Australia, Sudan and Uganda and has carried out major geochemical investigations for many mining clients on gold, base-metal and industrial mineral projects globally.

COST

\$550.00 + GST per person.

Classes are limited to eight participants ensuring individual attention is provided where needed.

Single client bookings for larger classes are offered.

We deliver customised courses to suit your exact requirements.

TIME

9:00 AM – 5:00 PM (Perth)

8:30 AM – 4:30 PM (Kalgoorlie)

HOW DO I REGISTER?

Email marketing@csaglobal.com or register by visiting our website: www.csaglobal.com/training/





csaglobal.com

