

## What Industry Wants From Research

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Mining and exploration companies generally have limited, if any, capacity to undertake research “in house.” Even those organizations with some internal research and development (R&D) mandate and capability will rarely work in isolation from the research community. Thus, industry reliance on geoscience researchers is inevitable and can range from simply monitoring the literature to collaborative industry-research consortia to one-on-one partnerships and long-term alliances. Despite the evidence of successful partnerships between the two groups, an unfortunate perception prevails in both camps that “they just don’t get it.” The geoscience research community has made a sustained and significant contribution to the science of mineral exploration for many decades, but there remain many opportunities to improve the quality of partnerships between industry and researchers and the value those partnerships deliver.

The most productive collaborations are always beneficial for both parties. So perhaps we should start by asking, what do researchers want from industry? There is clearly an opportunity for industry to be more flexible in considering the confidentiality of industry-funded research. Researchers have careers and performance metrics just like industry geologists and, in many instances, confidentiality restrictions have very little impact in the industry space but can dramatically impact the perceived academic standing of the researcher among the academic community. Industry needs to be more measured and reasonable with confidentiality requirements and recognize that it’s not what you know that creates value; it’s what you do with what you know that creates value. As the sponsor of a piece of research, you are far more likely to extract value from it than a competitor reading about it in a journal. Industry also needs to recognize that most research institutions have limited funds and resources, so paying for research up front allows researchers to secure the necessary resources, confident that research funding won’t be withdrawn mid-project as a result of volatile annual budgets. And, perhaps most importantly, the (understandable) industry focus on short time frames for delivery also needs to be moderated. Quality research takes time. If researchers can focus on addressing a few very focused core issues, rather than promising the world, and industry sponsors can accept plausible time frames to complete the research, common ground can surely be reached.

Productive research collaboration requires a shared vision and a deep mutual understanding of the problems to be addressed. And this is where industry-research partnerships are often compromised. Fundamental scientific research provides the building blocks for future applied scientific research. It is critically important, but it is not the business of mining and exploration companies. History tells us that industry R&D groups that drift into fundamental research sponsorship simply do not survive boom and bust cycles in the mining industry. Research must create measurable impact and value in the business, or there will not be any industry research funding at all. The research community must understand and accept this reality and resist the temptation to shoehorn fundamental research into an applied research funding environment. Attempts to do so are not deliberate; they generally stem from a lack of understanding of the exploration process, resulting in a failure to appreciate that even a successful outcome will be either ineffective or impractical in the operational exploration environment.

The key to understanding what exploration geoscientists need from research geoscientists is an appreciation of two major components of exploration geoscience: scale reduction and false positive minimization. In the simplest terms, exploration is a scale reduction process, from terrane to region to camp to deposit. Each scale reduction step costs more and the risks increase exponentially. The stakes are high; money and resources can be spent on the wrong area, mineral systems can be missed or

underestimated, reputation and credibility are potentially on the line with every decision made. The data, techniques and concepts which inform this scale reduction process are all prone to false positives. False positives are the greatest evil in exploration. They divert resources, money, and time with no reward, which is compounded by the lost opportunity cost; all those resources could have been directed somewhere more productive. So what does industry want from research? The simple answer is robust, practical scale reduction processes, tools, and concepts with a low risk of false positives. Researchers need to understand clearly how successful outcomes will contribute to scale reduction decisions, particularly at the regional to camp and camp to deposit stages. They need to understand and demonstrate the false positive rate, which generally requires much more data from far more diverse environments than are available to most researchers. Nothing does more damage to the industry-researcher relationship than “new techniques” based on insufficient data with every red dot, bump, or line on the map potentially another orebody! If new exploration techniques and concepts were easy to deliver on, we would be finding a lot more quality orebodies than we are today.

Research geoscientists and exploration geoscientists rarely get the opportunity to fully understand the drivers and challenges each faces, but with genuine, two-way, mutually beneficial collaboration, with open communication and a shared vision, they can certainly work together to deliver the next generation of mineral discoveries.