

THE CONTROVERSY OVER RESERVE ESTIMATES

POST

Whistleblower raises doubts over ore bodies

QUESTIONS RESERVE LEVELS

“This is the mining world’s equivalent of aggressive accounting”

BY SANDRA RUBIN
Senior Business Writer

A majority of Canadian mining companies are using a form of statistical “geo-engineering” that permits them to inflate proven and probable reserves by up to 25%, says the man who raised the spectre of fraud at Bre-X Minerals months before it became public.

Jan Merks, who has written a textbook on mineral sampling, says geostatistics can be manipulated as easily as financial statements to present a deceptively favourable view to investors.

“This is the mining world’s equivalent of aggressive accounting,” said Mr. Merks, president of Matrix Consultants Ltd. in Vancouver and something of a controversial figure in the Canadian mining world. “If you put inventories that you don’t have on the books, then it is just as wrong.”

It is a technical debate that has smoldered at the edges of the geological world for years, without attracting investor attention. But Mr. Merks’ claims, in the wake of the accounting scandals that have shaken faith in North American securities markets, are bound to have new relevancy for an investing public soured on overly optimistic projections.

Canadian mining executives contacted by the *Financial Post* say the methods they employ to

map ore bodies are proven to be reliable, and constitute the industry standard. There is no allegation the companies are doing anything illegal.

However, if Mr. Merks is correct — and he has some high-profile supporters — it means the value of the deposits that underpin the share prices of this country’s publicly traded gold, silver, copper, platinum, nickel and coal mining companies may be inflated. It also implies that world inventories are lower than believed.

“I have no doubt Jan Merks is extremely credible,” said Norman Anderson, the former chief executive and chairman of Cominco Ltd., as well as a longtime former director of Toronto-Dominion Bank and Homestake Mining Co.

“I would believe his statistics over many others.”

Mr. Merks says the problem is with geostatistics, a computer-driven variant of applied statistics developed in the 1960s to calculate the size of mineral finds.

He says it has turned out to be flawed science, but the industry has maintained it as the standard nonetheless because it is in their interest to have the most aggressive resource estimate possible.

“The companies, the investment bankers, the lawyers, they just don’t want to hear about it because it limits their ability to raise money,” he said. “The industry doesn’t want limits. It wants room to manoeuvre.” The problem, according to Mr. Merks, is that the geologist entering the data from drill holes is required to make assumptions about the size and shape of the ore body — including whether mineralization is continuous between drill holes.

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A question of confidence

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Mr. Merks claims to have been shut out of this country's scientific fraternity by a few influential disciples of geostatistics who have much to lose academically if it is accepted as flawed science.

He says he has been denied a fair hearing and that abstracts accepted by influential U.S. journals, including those published by the Society for Mining and Mineral Exploration, are routinely turned down by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) *Bulletin* following peer review by geostatisticians.

Mohan Srivastava, who co-authored a textbook on geostatistics, acknowledges that Mr. Merks "touches on an important issue, because there is enough flexibility in the tool kit to inflate reserves."

But Mr. Srivastava says he believes there is a "smoke and mirrors aspect" to his claims, and complains Mr. Merks can be evasive when asked for straight answers.

"The couple of times I've had access to work that he's done, or papers he's written, I haven't been able to make sense of it — and I think I've been pretty fair-minded," he said in an interview. "I can't imagine there's a silver-bullet calculation out there that is going to say: This is wrong by 12.2%. It strikes me as a bit nutty."

However, Cominco's Mr. Anderson, who is retired, says he began working with Mr. Merks in 1978 in a practical setting "and it was soon recognized throughout the company that this guy knew what he was talking about. He's got a bit of a sharp personality, but he's blessedly smart.

"The problem is, you get three or four geologists in a room using geostatistics, Jan waltzes in and tells them they're wrong — and they're going to get pissed," he said. "There are a lot of vested interests out there. It takes time to turn the Queen Mary around."

But while many in the academic community dismiss Mr. Merks and his claims, he is consulted by the largest and most reputable North American mining companies when they encounter problems with mineral deposits.

Barrick, Placer Dome Inc., Falconbridge Ltd., Kinross Gold Corp., Cominco and Homestake are among those that have retained him over the years to take a second look at their sampling practices. He is almost always retained quietly, and signed to confidentiality agreements — sometimes by an exploration chief who doesn't want senior executives to know he has been called in.

I CAN'T IMAGINE

THERE'S A SILVER

BULLET CALCULATION'

Mr. Merks says while it may suit the industry to have maximum manoeuvrability in the initial stages of an acquisition or find, when it comes to bankrolling the development, everyone wants an accurate view of what is in the ground.

He says where there are discrepancies, companies will usually state at some point that the probable reserves simply didn't pan out as expected. They will also reduce the life expectancy of a mine, blaming dilution of the ore body, to hide the fact that the deposit was smaller than had been first indicated, he claims.

"Canadian shareholders should be furious. They are the ones who should take action. They are always the ones who pay when mines have to be scrapped."

Mr. Merks is writing a textbook entitled *Geostatistics; Human Error or Scientific Fraud?* to explain why geostatistical ore deposits are likely to shrink during mining.

He says, at the very least, his method would ensure resource estimates were accompanied by confidence limits — as with public opinion polls — which state the results are considered accurate to within a certain percentage 19 times out of 20.

That way, investors could get some sense of how aggressive the assumptions were, because confidence limits define the uncertainty of the final results.

Michel Dagbert, co-founder of Montreal-based Geostat Systems International Inc., is a staunch proponent of geostatistics. Surprisingly, he says much of what Mr. Merks says is correct: that it is easy to inflate resource estimates using geostatistics (as well as a number of other methods, he says) — and that there should be some validation to bear it out. He too would like mandatory confidence limits.

"The thing is, we disagree on the method with which to do it," Mr. Dagbert said from Montreal.

He said companies using geostatistics do validate their findings in a number of ways, including looking for correlation between samples, sensitivity analysis and testing core from blast holes to verify the estimate is correct.

"If people don't want to do it his way, maybe it's because they don't believe in what he is proposing as this extra step. It's a question of statistical theory, it's a debate."

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A question of confidence

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The assumptions are based on many factors, including the geology of the region and experience with the mineral in question.

But Mr. Merks claims a simple test can be administered afterward to verify that the assumptions, and the resource estimate, are accurate. It involves using applied statistics to test for the continuity of mineralization between the holes.

Without it, he says, "geostatistical video games" can be used to boost resource estimates by 10% to 25%, as well as misrepresent the continuity of the ore — which has a direct impact on how much can be profitably mined.

Mr. Merks insists that if Barrick Gold Corp. had employed his methods, the company would not have "misjudged the grade of ore in its mines." Barrick made headlines last week when it cut its profit forecast for the year by about one-fifth because of lower than anticipated grades and recovery rates at mines in Canada, the United States and Tanzania. Its share price took a beating.

Barrick challenged the relevance of that view, however. "This has got everything to do with mine sequencing and processing rather than ore reserves," said vice-president Vincent Borg. "We've got a track record of almost 20 years of accurately estimating reserves and mining them successfully."

The U.S. Securities and Exchange Commission says it is aware of the controversy surrounding geostatistics and, while it permits the method to be used as part of a company's resource calculations, it does not permit estimates based on geostatistics alone.

According to John Heine, a SEC spokesman, the U.S. regulator requires a number of additional measures, including more actual drilling. The SEC has also been known to question resource estimates where it believes the assumptions are too aggressive.

In April, for example, Stillwater Mining disclosed that the SEC was challenging its methodology, which quickly sent the company's share price down 15%.

Stillwater, which had been making assumptions of uninterrupted mineralization up to 1,900 feet beyond each drill core sample, agreed to limit all assumptions to 1,000 feet. The revised assumptions shaved 10% from its probable reserves — underscoring how closely the assumptions and the eventual resource calculations are linked.

Canadian securities regulators do not appear as tough.

Deborah McCombe, chief mining consultant at the Ontario Securities Commission, says provincial securities commissions recently adopted a series of measures they believe will help prevent the types of abuses Mr. Merks is concerned about. She said she is aware of his work and that he is considered respected.

Under National Instrument 43-101, Canadian companies must have resource estimates prepared by a "qualified person" — a geologist with a minimum of five years' experience, including experience with the resource in question, who is also a member of a professional society.

Ms. McCombe did not explain how this would prevent a geologist from adopting the most aggressive of the plausible assumptions, other than to say that concerns for reputation might help keep them in line.

She added that reporting issuers are subject to a comprehensive review every four or five years, at which time "everything is looked at" retroactively, including all technical reports.

She also said she may review reports as they are filed, "but I'd only look if I really thought there was an issue, that something didn't seem quite right. We're not checking every single report here. We're relying on mining companies to have proper disclosure."

The OSC, Canada's largest securities regulator, has not ordered any resource rollbacks similar to Stillwater in recent years.

John Ing, president of Maison Placements Canada, says there is no question the SEC is tougher than the OSC when it comes to reserve estimates. "Their classification is stricter," says Mr. Ing, a gold analyst. "The American regulations are tighter than Canadian in this area."

Mr. Merks' claims are surfacing at a time the TSX is said to be contemplating marketing itself internationally as a specialty exchange with expertise in mining.

He has been battling the scientific establishment for years over the limits of geostatistics, and contacted Canadian regulators and exchange officials, but to no avail.

He wrote Rowland Fleming, the former president of the Toronto Stock Exchange, in 1997 — in the heat of the Bre-X gold fraud — and urged him to talk to the Standards Council of Canada about setting up a committee on ore-reserve estimation techniques.

"I appreciate your taking the time to write and have duly noted your comments," Mr. Fleming said in a two-sentence response.

Nothing further happened.

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Consultant Jan Merks: 'A bit of a rebel'

BY SANDRA RUBIN
Senior Business Writer

Persistent criticism of prevailing industry standards may turn some people into heroes. It has made Jan Merks something of a pariah in the ranks of Canadian geological academe.

His fight to prove that geostatistics allows mining companies to make mineral deposits look better than they really are has won him little public acclaim. Instead, he has found himself reviled as a pain or dismissed as a self-promoter.

But when Barrick Gold had trouble making sense of gold assays it received from a junior explorer it was looking at in the fall of 1996, it headed for him. It sent Mr. Merks the data, and signed him to a three-year confidentiality agreement.

Within 24 hours of receiving the data, Mr. Merks told Barrick "extreme caution is in order," and said a few years previous to that he had "investigated a case of fraudulent gold assays" involving questionable samples that exhibited certain anomalous characteristics.

He said the samples from Barrick made him think "perhaps the question [of the same characteristics] should also be addressed in this case."

"This case" was Bre-X Minerals Ltd., and it was almost four months before the massive salting scheme was exposed.

Barrick, which was later pulled into a U.S. legal battle over Bre-X, has rejected any suggestion that what Mr. Merks told them constituted a warning of fraud, and says he did not even mention it until two months later, and then only as one of three possibilities. "He never expressed an opinion whatsoever," says Vince Borg, a Barrick vice-president.

The Dutch-born mineral sampling expert is no stranger to controversy. And while he may not win any popularity contests, he is

nonetheless often called into troubling situations.

He has waged a decade-long campaign against "voodoo geostatistics" from the basement of his Port Coquitlam home, armed with little more than a vast knowledge of mineral sampling and applied statistics, an unrelenting sense of purpose and formidable perseverance.

His stance has put him sharply at odds with existing scientific thought. But he claims he has been denied a fair hearing in Canada by a clique of academics who have staked their careers on geostatistics and who are very active in the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), the leading technical society.

He is not the only one.

"The CIM has a lot of people on the board who believe geostatistics is an advancement," says Vivian Danielson, long-time editor of *The Northern Miner*. Ms.

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Danielson, who has left the newspaper to move back to British Columbia, says in her view Mr. Merks has not had a fair hearing, and that she called for it in the *Northern Miner* over the years.

"I have a lot of confidence in Jan Merks and his methodology. It has been proven to work in a number of scams. What I argued in the paper is why not look at his methodology, and geostatistics, and see if some understanding can be arrived at that serves investors better. Why not give him a fair hearing? I don't understand the reluctance.

"But the CIM and its board are dominated by geostatisticians, many of them from Laval University, and the *Bulletin*, the premier technical publication, has always

peer-reviewed his work by having geostatisticians peer review it. It's an interesting, interesting story."

But Michel Dagbert, an influential figure in Canada's geostatistical establishment, says he is put off by Mr. Merks' abrasiveness and his insistence that he is right. He says it has not helped foster an academic debate. "We don't like the way he talks to us. He is antagonistic."

Marcel Vallée, a past president of the Geological Society who is active in the CIM and is one of Mr. Merks' most high-profile critics, did not respond to repeated telephone calls and e-mail requests for an interview. Yves Jacques, the spokesman for the CIM, did not return a call requesting comment.

Rob Pease, general manager of mineral exploration projects for Placer Dome Inc., says Mr. Merks is well respected for some aspects of his expertise in mineral sampling — but he remains skeptical of claims that he can take much of the guesswork out of ore estimation with applied statistics.

"In the scientific community, Jan is seen as a bit of a rebel, always stirring the pot and saying: 'Gee, you guys aren't doing this thing properly,' and some of the things he's wanted to publish have been turned down for publication.

"He feels he's been rejected by the industry and the scientific community — and that's true. But he's not necessarily the easiest guy to get along with, [although] if you put yourself in his shoes you can see why he'd feel very frustrated."

Ms. Danielson says she agrees, and she is sympathetic.

"When you believe you are right as adamantly as he does, and you defend that like a warrior, then you develop relationships with people who might then respond in an adversarial manner.

"But on the other hand, he believes his methods have greater precision. If it's all about precision, how do you then compromise? It's a bit of a Catch-22."

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