# A NEW DAWN FOR RESOURCE CALCULATING GEOLOGISTS?

***D. R. Wardrop***
*Lafarge Aggregates Limited, Panshanger Park, Hertford, SG14 2NA, United Kingdom.*

## Abstract

There are massive financial implications for natural resource companies on the accuracy and honesty of resource evaluation work, a message that the geological community has arguably failed to communicate or be recognised for. There have long been legislative and professional codes on these matters but never with so high a profile until the Sarbanes-Oxley Act (2002) in conjunction with highly publicised resource debates and corporate failures. There have been resource scandals in the modern era due to fraud, incompetence or bad luck, from the Poseidon affair to Parmalat. The Enron bankruptcy lead to the Sarbanes-Oxley Act and virtually all multi-national minerals companies are affected.

The matter becomes of particular relevance to the resource-calculating geologist in the financial implications of their work. Natural resource companies are different from other types of trading entities. The DOT.COM company has virtually all the value in its trading position while it is not unusual for 80 to 90% of a mineral company value to be represented by tangible assets. In this area and that of environmental liability, the geologist has a key corporate governance role. The Competent Person is recognised under other codes as the person who will determine what numbers are used for valuation purposes and companies need processes that support the people making these decisions.

*Wardrop, D.R. 2008. A new dawn for resource calculating geologists. Pp. 33-36 in Walton, G. (Ed.) Proceedings of the 14th Extractive Industry Geology Conference, EIG Conferences, 109p.*

## Introduction

Most geologists in the extractive industry will take their responsibility for resource/reserve calculation very seriously. There are many ethical, professional and practical reasons for this. There are massive financial implications for natural resource companies resting on the accuracy and honesty of resource evaluation work. This is a message that the geological community has arguably failed to communicate, capitalise on, or be recognised for.

There have long been professional codes and guidance on these matters but these have been of comparatively low profile and are sometimes at arms length from the practising geologists. For instance there are financial regulation codes such as The Combined Code of Corporate Governance (July 2003); the Royal Institution of Chartered Surveyors Red and White Books; a European Green Book; and the various geological professional bodies' codes that as a minimum require members to only act within their area of competence. These responsibilities and requirements have never had as high a profile or as direct a relevance until the arrival of the Sarbanes-Oxley Act (2002) in conjunction with some highly publicised resource debates.

## Corporate Governance

Geologists have a wider role in corporate governance in areas such as environmental responsibility, safety and asset management. It is sometimes not well recognised. These areas themselves are covered by legislation or codes of practice but mere compliance possibility misses the meaning of the phrase. One definition of corporate governance given to the author (KPMG personal communication) is that there are four key strands:

1. Help leaders to maintain sustainable organisations – that are;
2. Accountable to shareholders
3. Capable of returning value to them
4. Worthy of marketplace trust

The balance is thus trying to align the interests of shareholders/investors and directors/managers/employees

| Year | Company |
|---|---|
| 1970 | Poseidon |
| 1990 | Guinness |
| 1991 | Mirror Group |
| 1991 | BCCI |
| 1997 | BreX |
| 2001 | Enron |
| 2002 | Worldcom |
| 2003 | Parmalat |

***Table 1 .*** *Notable Corporate Failures.*

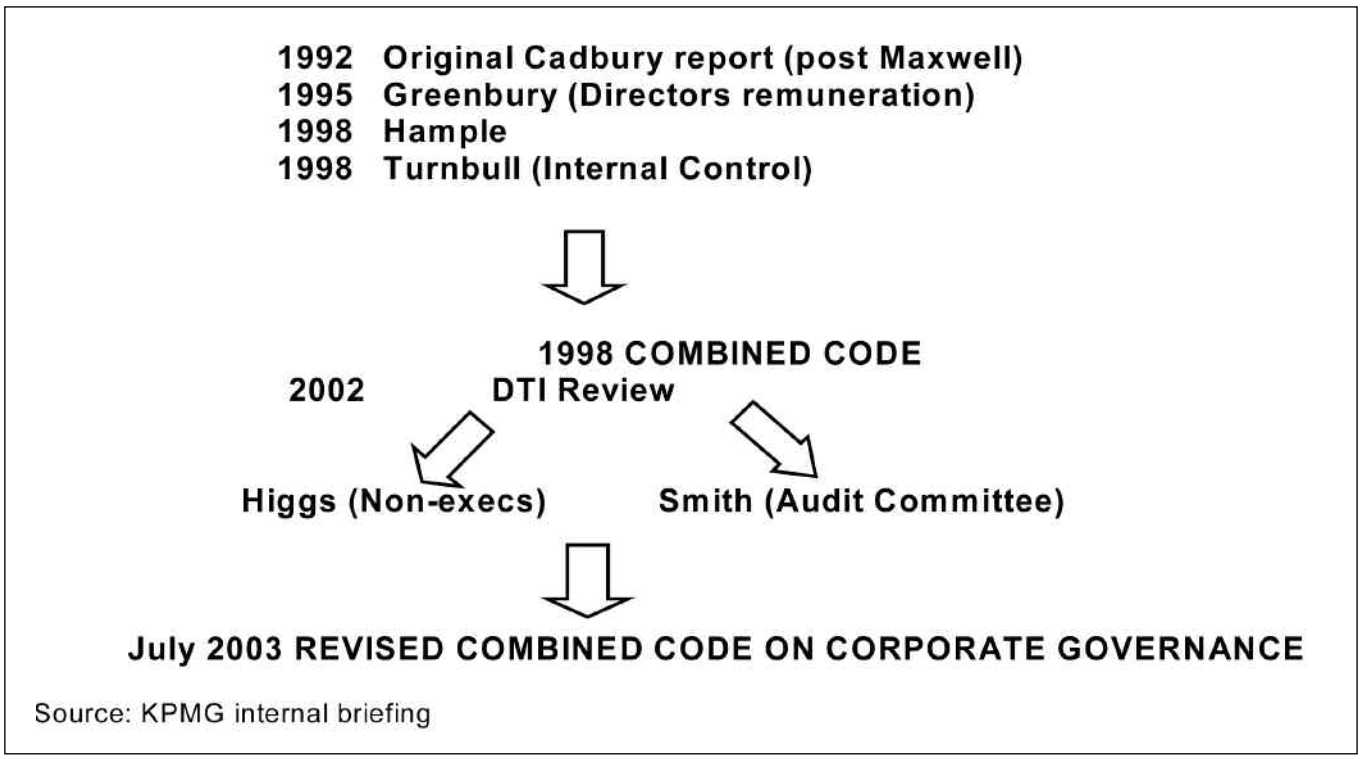


***Table 2 .*** *Development of codes of practice in the UK.*

whilst maintaining confidence on the capital markets. Clearly the resource base for a natural resources company has an influence on all the above.

There have been several resource scandals in the modern era due to fraud, incompetence or bad luck, starting with the Poseidon affair in the late 1960s. Previous metal mining history particularly is littered with hundreds of dishonest ventures in the USA alone (Donaldson 2002), whilst the BreX scandal of 1997 was a very public international matter. In addition the last 15 years have seen some notable corporate bankruptcies such as BCCI, Guinness, Enron, and Parmalat (Table 1).

In the same time period, there has been a major growth in codes and legislation on both sides of the Atlantic intended to address these problems, protecting shareholders, customers and employees. The UK approach since the early 1990s has tended to be one of voluntary "comply or explain" with a series of codes being drawn up (Table 2). The Revised Combined Code does not carry the force of legislation, although the UK government were said to be considering this step, but for many large companies the requirements have been overtaken by events.

The Enron bankruptcy in spectacular style caused the United States Government to act on the matter of corporate financial reporting and the inquiry headed by Senator Sarbanes and Congressman Oxley generated recommendations that became the eponymous Act in 2002. Companies that are listed in the New York Stock Exchange or have major subsidiaries listed on the same exchange are obligated to comply with the requirements of the Sarbanes Oxley Act (2002) by the end of 2005, or 2006 depending on their domestic or foreign status. Virtually all of the multi-national minerals companies are therefore affected and are answerable to the US Securities and Exchange Commission.

The central tenets of the Sarbanes-Oxley Act (2002) are concerned with honest and transparent financial reporting of both day-to-day trading economics and of future liabilities incurred short and long-term. Key phrases in the author's view are the requirements for "an adequate internal control structure" and ***"an evaluation of whether such internal control structure and procedures include maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the issuer;"***. This is very similar to the UK Combined Code that refers to ***…"a sound system of internal control….."***

Ethics and integrity are specifically referred to both in respect of financial officers and the government board that oversees the Act. Companies are required to state that they have a published code of ethics for the financial functions, or explain why if they do not. Interestingly, the UK Code although not legislative, casts the net of integrity more widely to include senior management.

There are no explicit requirements for natural resource companies, but all geological managers in their day-to-day work will be subject to the routine management processes that are required. One of the acknowledged unintended consequences type of risk is that companies can go into a process frenzy and paralyse themselves with bureaucracy (KPMG personal communication).

Where the matter becomes of particular relevance to the resource-calculating geologist is in the financial implications of their work. Ultimately the auditors of a company require to be able to make a statement on the accounts that those accounts are Sarbanes-Oxley (2002) compliant. The penalties for wilful non-compliance are severe and include going to jail. At the time of writing two senior board members of Enron had been sentenced to jail terms in excess of 25 years.

## Financial Consequences of Geological Precision

Natural resource companies are significantly different from other types of trading or manufacturing entities. At one end of the scale is the DOT.COM company where tangible assets are virtually nil, and all the value of a company is in its trading position or goodwill. At the other end of the scale it is not unusual for 80-90% of the market capitalised value of a mineral resource company to be represented by tangible assets, primarily mineral reserves, landfill void, fixed plant, buildings and land. In the case of most companies the greater part of this will be the mineral reserves.

The economics of a mineral extraction operation are fundamentally affected by the precision of the geological investigation and resource assessment. In the first place the mineral must be of suitable quality to meet the required market demand and the quantum of mineral is the key determinant of the life, rate of output, total financial return from the venture, the level of capital investment that can be sustained, and the basic operating economics such as saleable products against waste.

The key elements of the land acquisition negotiation access provision, planning and development costs are all determined by the saleable reserves. All the carrying costs of a mineral operation from direct operating costs such as fuel and manpower to capitalised development costs, taxes and other outgoings through to terminal restoration and a share of overall company overhead ultimately distils down to a cost per tonne of sold product. If the reserves calculation is 20% adrift then the majority of the costs will be 20% adrift. It is therefore important to a company that mineral reserves are dealt with consistently and by a defined team of professionals, not least in order to protect the shareholders from any local adjustments that may be less than well informed.

## Accountability

The Sarbanes-Oxley Act (2002) is not prescriptive about the detailed processes that are required of a company, but it is prescriptive about demonstrating to auditors that a company's procedures enable compliance to be achieved. In many cases it is up to individual companies to create or enhance their existing processes such that their auditors are able to make their required statement on the accounts.

It is almost inescapable that the resources geologist, who has always been accountable for his or her own work, becomes formally so. This in itself raises issues of actual competence, track record, continuing professional development and adherence to one's professional codes. In terms of actual offences the Sarbanes-Oxley Act (2002) really concentrates on financial officers but there is therefore an implied duty on the geoscientist to support those colleagues and make sure nothing goes awry. For instance, tampering with a record is a specific offence, so the geologist should make sure that resource numbers that leave the geologist's desk do not change in the process of their use elsewhere in the company.

One of the other risks in addition to "process frenzy" is that a company relies too heavily on outside advice in the belief that this affords them some degree of protection. There is no natural law so far as the author is aware that states that professionals outside of a company are automatically more competent, of higher integrity, and more experienced than those directly employed by a company. As in most areas of expertise, a judgement is required on how best to approach the matter in the case of each individual company.

## Role of Resources Geo-scientists

The Competent Person has long been recognised under other codes as the person who will determine what numbers are used for valuation purposes during company valuations or mergers and takeovers. It is probably fair to say that the definition of the Competent Person is a little vague but now the real responsibility and accountability of that person could be thrown into stark relief. It has been suggested that there should be a register of certain professionals for this purpose in the oil industry (Turnbull 2005). Construction materials geologists are fortunate in not having to deal with the significant price volatility experienced in the oil and metals sector whereby a perfectly sound "reserve" one day may cease to be so overnight.

For a manufacturing company a stock-take is a matter of counting identifiable items. This may well be a very complex task in multiple locations but ultimately it is about determining a finite number of identifiable items. Mineral resources in the ground are less clear-cut.

There is debate in the construction materials industry on the precise definition of 'reserves' but a key phrase that the author would commend is "saleable reserves under current and foreseeable technical and economic circumstances". Over a period of time the physical material in the ground may remain entirely unchanged but the surrounding circumstances might change, and a reserve one year may not be a reserve the next. An element of judgement is required and sooner or later a Competent Person or persons require to make that judgement. Companies need processes therefore that support the people making these decisions and judgements whilst giving the auditors confidence that every effort is being made to ensure accuracy. A typical process might involve a suitably experienced geologist checking and signing another geologist's work and being in a position to demonstrate this to auditors.

What is certain is that reserve calculations cannot be carried by a financial person. Therefore it is imperative that the auditors, who are almost inevitably financial people, understand the sorts of processes that a resource geologist has to undertake from exploration to site excavation. A demonstrable track record is a very powerful tool in this respect (Wardrop, 1999) as are written protocols within a company.

## Implications For The Geological Community

There are positives and negatives presented by the requirements for rigorous financial process. The positives are:

- More visibility and importance of the resource geologist's role.
- Closer links between financial implications and

the work of the resource geologist.
- Clear legal support for the role.
- Better integrity and reputation of the natural resources industry.
- A clear role for the geologist in corporate governance.
- A greater consistency of corporate treatment of reserves leading, in the case of the aggregates industry, potentially to more accurate county landbanks and more realistic national planning.

The negatives are:

- Greater scrutiny than ever of the resource geologist's work.
- Difficulty in explaining the role of interpretation versus pure fact.
- Difficulty in explaining or justifying genuine mis takes or shortcomings in data.
- Pressures of audit by the unknowing or the unfamiliar.
- Risk of "over audit."
- Going to jail.

## Conclusions

In the author's opinion the requirements of Sarbanes-Oxley (2002) and similar legislative instruments confer an overall benefit on natural resource geologists. It places these professionals firmly in a mainstream, financially responsible role and forces the recognition of this from other professionals and colleagues. It is axiomatic that internal company protocols need to be suitably robust without becoming impracticably complex. Provided that companies do not engage in overly bureaucratic and unnecessary processes, the honest, competent, resource geologist has nothing to fear from new reporting requirements.

## References

Anon. 2003. Combined Code of Corporate Governance. UK Department of Trade and Industry

Donaldson, W.S. 2002. Arizona mining scams and un-assayable ore projects of the late 20th Century. Arizona Department of Mines and Mineral Resources.

Sarbanes-Oxley Act. 2002. United States Congress.

Turnbull, J. 2005. Calling all reservists. Geoscientist Vol, 15, No. 12, p15.

Wardrop, D.R. 1999. A Study on the accuracy of sand and gravel reserve estims. Quarterly Journal of Engineering Geology, 32, 81-86.