BLOWING IN THE WIND

LEGITIMACY THEORY. AN ENVIRONMENTAL INCIDENT AND DISCLOSURE

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ABSTRACT

Purpose

Change in CSR in annual reports before and after a major environmental incident in 2006 is investigated.

Design/Methodology/Approach

Content analysis adopting words was undertaken (2004 to 2008) of annual reports of the 'incident' company and 30 other companies in that industry.

Findings

The results indicate the quantity of disclosure increased over the period. The 'incident' company did respond by increasing disclosures after the 'incident' year. This was not clear for the 'other mining companies'.

Research Limitations/implications

This paper adds to the literature that considers social and environmental incidents in the context of legitimacy theory. The differential results suggest that further investigation is warranted in terms of sample size and in the context of internet reporting.

Originality/Value

This exploratory study adds to literature in CSR, the implications of incidents affecting the environment, addressing stakeholders and the relevance of legitimacy theory.

Keywords

Legitimacy Theory, CSR, Disclosure, Stakeholders, Annual Reports

Classification

Research paper

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Introduction

This study explores, in the context of legitimacy theory, changes in the disclosure of social and environmental information within annual reports in the period 2004-2008. The focus is on an environmental incident that occurred in May 2006 which led to issues being raised by stakeholders and resulted in Alcoa being charged with criminal negligence by the Department of Environment and Conservation. The incident impacted on the environment and affected the health of residents living in the area to such an extent that it received media coverage both within the community and further abroad, and Erin Brockovich, US Health Campaigner became involved. Such publicity had the potential to generate a reaction from Alcoa (and possibly the industry) in the form of increased levels of disclosure to re-establish their legitimacy with stakeholders.

The Incident

The West Australian Department of Environment and Conservation (DEC) alleged that on the 14th of May 2006 poisonous dust was emitted from Alcoa's aluminium refinery located in Wagerup, Western Australia (Nine News Australia, 23 July 2007*)*. Red dust was blown from Alcoa's waste stockpiles which contained radioactive thorium and heavy metals. Allegedly, Alcoa failed to fix the refinery's waste management system resulting in an accusation that the company was criminally negligent. The charge resulted from a health study that found residents living near the Wagerup refinery exhibited higher rates of symptoms associated with chemical exposure than people elsewhere in West Australia. Residents were found to have increased susceptibility to nosebleeds and cancer, effects unacceptable to the community. The charges were prompted by complaints made by thousands of the local residents over the emissions from Alcoa's alumina refinery in Wagerup, Australia. A community action group commented that most homes within three miles of the refinery have been sold to Alcoa (Napsha, 2007). Given the publicity this incident received, local reaction and the involvement of US health campaigner Erin Brockovich, it might be expected that Alcoa and firms involved in the mining industry could have faced a threat to their legitimacy, and have taken action to offset such a threat.

Motivation and Justification

This study set out to compare the incident with earlier studies of environmental incidents with a view to ascertain the relevance of legitimacy theory and social contract in assisting to explain behaviour noted. Hence it was examining whether the company in question (Alcoa), and the industry more generally, increased their level of environmental disclosures after a major environmental incident Given that such disclosures were increasing over that period, a significant jump in disclosures after the incident would be expected in order to suggest that the incident impacted on disclosure practices and could be explained by reference to legitimacy theory. It would also be expected that disclosures would fall off again after the initial reaction suggesting a pragmatic approach to legitimacy theory. Further, this study explored changing disclosure levels in the context of a number of categories of social and environmental disclosures developed later in this paper.

Contribution

This study was intended to fill a gap in the literature given that there are few Australian studies, and fewer more recent studies that have investigated the impact of environmental incidents on management's decision to change their level of disclosure as evidenced in annual reports. Types of disclosures were identified to explore not only change in total disclosure across the time period and between the pre and post incident periods, but also to consider change in the categories of disclosures undertaken by management. It therefore identified whether changes in social and environmental disclosure were more likely to be from particular categories of disclosure. This study also contributes to existing studies that seek to identify whether changing disclosure patterns can be argued to reflect legitimacy theory and social contract.

Legitimacy Theory and Social Contract

Disclosures may be utilised by corporations to demonstrate to society that they are fulfilling their obligations to stakeholders[1]. Legitimacy theory suggests that organisations continually seek to establish congruence between the social values associated with or implied by their organisational conduct and the norms and bounds established by the society of which they are part (Deegan & Bloomquist, 2006). The need to demonstrate that a firm is operating in a socially acceptable manner is at the base of legitimacy theory. It is expected firms involved in social and/environmental incidents likely to affect their perceived legitimacy will undertake disclosure strategies to explain and excuse any negative aspects of their corporate performance, or act to redirect attention in order to maintain society's acceptance of their activities.

Legitimacy is a status that is an outcome of society's collective perception about the organisation's operation. It is a social assessment or appraisal of corporate conduct that is considered acceptable, appropriate or/and desirable (Zimmerman & Zeitz 2002). Therefore it is expected that firms will undertake acceptable behaviour or at least to be perceived as such so that they are perceived to be "good" corporate citizens. Suchman (1995, p.574) emphasises that legitimacy is "a generalised perception or assumption that the actions of an entity are desirable proper or appropriate within some socially constructed systems of norms, values, beliefs and definitions". The basic tenet of legitimacy theory is that the perception of the firm by the community is based on how that organisation has acted in line or otherwise with socially determined expectations. Often this is the perception of management based on their views of the stakeholder.

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[1] For example, in 1995, Shell experienced negative publicity after it announced its decision to sink the Brent Sparr. Environmental groups such as Greenpeace activists undertook a campaign to stop ocean dumping. As a response Shell published an ethical report in 1998. Hoogheimstra (2000) suggested that this change in Shell's reporting policies revealed that social and environmental disclosures were aimed at providing information to legitimatise corporate activities (p.64).

Major corporate incidents such as poisonous gas emissions, oil spills or chemical leaks can occur which often result in high environmental, social and/or financial consequence to both the organisation and the wider community[2]. From an organisation's perspective community response might include legal restrictions, increased difficulty accessing financial and human resources, and reduced demand. In such instances whereby society perceives that an organisation's cost is greater than its benefits to society a firm may risk sanctions forced upon it by society for it to continue to own and use resources, and ultimately its very existence may be threatened. Conversely, organisations that manage to communicate successfully that they are acting in accordance with the terms of what is socially acceptable (or explain why they are not) and contributing more benefits than harm to society, are likely to be considered legitimate.

Alcoa may be considered as a firm operating within an environmentally sensitive group because the company has received high levels of attention from Australian environmental lobby groups. In 1993 the Environmental Protection Authority of Western Australia stated that "Bauxite residue (red mud)...contains traces of some [highly poisonous arsenic, fluoride and aluminium] which if mobilised could pose environmental risk..." (Ryle, 2002). More than a decade later, the public pressure upon Alcoa for stronger environmental stewardship still existed. In 2005 Clare Wilson, a member of the environmental campaign group, Friends of Earth told BBC UK that the green credentials of aluminium mining by Alcoa are being overstated as the process of making aluminium is still very damaging to the environment (Ritson, 2005). In 2008 the conservation group, World Wildlife Fund (WWF) ranked Alcoa (together with Rio Tinto) as the world's least prepared company in terms of reducing future carbon emissions (Macdonald-Smith, 2008).

Companies involved in the mining industry are also expected to face a threat to their legitimacy as a result of the Alcoa mining emissions as Alcoa and mining companies operate within an environmentally sensitive industry (see, for example, Deegan and Gordon 1996). Social perceptions can be the result of a number of factors such as the occurrence of an undesirable social or environmental event which negatively impacts on the legitimacy of the company or industry (Patten 1992), media influence (Brown & Deegan 1999) and changes in community expectations with the implication that what was once acceptable corporate behaviour no longer deemed acceptable (Deegan 2002).

Suchman (1995) asserts that during crisis situations organisations can lose their legitimacy if their operations no longer conform to society's view of organisational behaviour, and therefore a firm must seek to 'repair' their legitimacy with stakeholders. 'Crisis' is interpreted by Pearson and Clair (1998, p.60) "… a low-probability, high-impact event that threatens the viability of the organisation and is characterised by ambiguity of cause, effect, and means of resolution, as well as by a belief that decisions must be made swiftly". Therefore, firms impacted by a crisis will undertake actions to attempt to ensure that their status in society remains legitimate. One of these actions includes adjusting the environmental disclosures that are made in the company annual reports in order to project a positive image.

In his paper Suchman (1995) identified three forms of organisational legitimacy. The first was pragmatic legitimacy, an approach where the firm responds to its most immediate

[2] For example, the Prestige spilled 63,000 tons of fuel oil into Spain's Galician coast in 2002. The preliminary cost for cleanup and lost economic activity was estimated at $42 million (Time.com, 20 November 2002) with the death of 300,000 sea birds and destruction of 750 Spanish beaches (CNN.com, 6 November 2003).

audience to seek their support. The second was moral legitimacy, where the issue is not the self interest of the stakeholder (pragmatic) but an assessment of what is ‘the right thing to do’ in a particular circumstance. The third form Suchman (1995) termed cognitive legitimacy. In this view legitimacy either takes the form of support for the firm’s activities, or possibly, mere acceptance that the firm’s actions are necessary or inevitable. These forms of legitimacy are interrelated and may co-exist in the real world. They may each result in the firm disclosing information to gain, maintain, or repair (as might be expected after a major environmental incident) legitimacy. In this study Alcoa would appear to need to repair legitimacy. At the pragmatic level stakeholders were adversely affected, at the moral level the firm should be seen to do ‘the right thing’, and finally at the cognitive level it would need to gain acceptance or support for its activities. As noted by Suchman (1988) in a later paper, legitimacy can be viewed as either a resource that is manipulated by management through strategies put together for fostering socially accepted legitimating perceptions, or by the pressures created by the firm’s institutional environment which compel the firm to conform and become isomorphic with its environment, thereby achieving legitimacy. Tilling and Tilt (2010) have argued that legitimacy is a resource flow. While in many ways it is an intangible resource, it must be at the least, established, maintained and at times defended. Defence becomes necessary when the established legitimacy has been threatened,, for example by a major incident affecting the firm and the industry.

At a macro level Suchman (1995) discussed ‘institutional legitimacy theory’ to consider how business as a whole gained acceptance by society at large. This compares to the micro level where Discussion of Social/Environmental Issues has taken the form of ‘organisational legitimacy’, that is, the approach taken by the firm to seek the approval of the community (see, Dowling & Pfeffer 1975, Kaplan & Ruland 1991, Driscoll & Crombie 2001). This study embraces both levels by looking for changed disclosure practices by the industry (macro level), and by the firm, Alcoa (micro level). Both levels involve seeking the approval of the community.

While the notion of legitimacy implies the ‘acceptability of a firm’s activities’ it is not really that helpful in assessing how it might work in practice. To this end it is linked to social contract, an approach able to identify how this ‘acceptability’ might be shown. The notion of social contract is introduced to operationalise legitimacy theory, to explain the social obligation of a firm. It contains the implicit and explicit expectations of society about how an organisation should conduct its operations. This notion allows us to identify the way corporations demonstrate legitimacy to society. Explicit terms are made up of legal requirements while other non-legislated societal expectations represent the implicit terms of the contract. Explicit terms (laws) reflect societal norms and values since issues raised by society are analysed through the public Statements of Policy arena and if deemed necessary, enacted into laws (Patten 1992). Since societal expectations are not static, but instead change across time, the terms under the social contract on which social approval is granted upon an organisation also change over time (Deegan 2006, p.281).

The notion of the “social contract” can be used to explain the relationship between organisations and its stakeholders. Similar to principal-agent relationship established in agency theory, the firm may be viewed as the agent who has an obligation to its principal, the stakeholder to operate within the bounds and values that are deemed acceptable by society. The social contract allows society (the principal) to “monitor” the activities of corporations to ensure that they are operating in an acceptable manner. The contract can be viewed as an agreement between corporations and the wider community who provide or merely allow corporations the right to use various resources and in exchange society expects the benefits to exceed the costs to stakeholders (Mathews 1993, p.26). This means that an organisation is allowed to continue its operations to the extent that it complies with the social contract.

If an organisation is involved in an event that causes some sort of environmental damage that is deemed unacceptable by society, it implies that the organisation has failed the first test of relevance as identified by Shocker and Sethi (1974). Such an outcome could impact on the economic, political and social benefits to the society from which it derives its right to operate. This incident could also impact on the legitimacy of corporations operating within the same industry due to the high social and ecological impact on the surrounding environment and community. Alcoa appears to be operating beyond the bounds of what society considers socially acceptable behaviour. This could result in a loss of legitimacy and society may ultimately revoke Alcoa's "contract" to continue its operations.

Using a legitimacy perspective it is argued that as a result of Alcoa's mining incident, Alcoa and the Australian mining industry will be motivated to change the level of their social and environmental information disclosures as a response to a perceived legitimacy threat from Alcoa's incident. Alcoa and all firms involved in the mining industry may have to take corrective strategies to restore society's perception and confidence in their companies' reputations which includes particular social and environmental disclosures in annual reports. One way to counter a perceived legitimacy threat, especially in the face of an environmental incident, has been to increase voluntary social and environmental disclosures (Deegan & Rankin 1996; Walden & Schwartz 1997; Deegan *et al*. 2000, 2002; Cho 2009). In the current study the impact at the macro and micro levels is considered by looking at the annual report disclosures of Alcoa and a sample of mining companies prior to, and after the environmental incident at Alcoa. The annual report was chosen as a statutory document and as a document in which a firm seeks to establish its 'own social imagery' (Gray et al. 1995 p.82). The report is addressed to a wide audience (stakeholders) and is a way for the firm to manage external impressions and indicate corporate social responsiveness (see, for example, Stanton & Stanton 2002, Neu et al 1998, Mangos & Lewis 1995). As this study seeks to identify change resulting from an environmental incident, the annual report would be a logical starting point to explore this impact within Australia.

Incidents and Disclosure

Firms involved in major incidents have been found to undertake disclosure strategies to explain and excuse negative aspects of their corporate performance in order to maintain society's acceptance of their activities. Patten (1992) evaluated the effect of the 1989 Exxon Valdez oil spill on the annual report environmental disclosures of 21 North American petroleum firms, excluding Exxon. He found an increase in environmental disclosures following the oil spill. Patten's (1992) results were extended by Walden and Schwartz (1997) who considered social and environmental disclosures of four industries, including oil companies. They found significant positive differences in the levels of environmental disclosure for the years 1988-1990 and concluded that the firms increased disclosures were a response to the incident.

Deegan and Rankin (1996) explored the changes in environmental disclosure policies of firms involved in environmental prosecutions. The authors found that prosecuted firms disclosed significantly more environmental information in the year of prosecution in comparison to other years in the sample period. The prosecuted firms also disclosed more environmental information compared to firms not prosecuted. However, disclosures contained minimal reference to the prosecution itself, which suggested firms had chosen not to report about incidents or increased disclosures intended to redirect the attention of stakeholders from their poor environmental performance.

Deegan *et al*. (2000) examined the impact of five major incidents[3] on disclosure reactions within and outside the country in which the incidents took place. Deegan *et al.* (2000) showed that companies in industries related to the selected incidents provided greater levels of total incident-related disclosures after the incidents in their annual reports, with the disclosures mostly positive in nature. In addition, the company (BHP Ltd) directly involved in two of the incidents (Moura Mine and Iron Baron) provided greater levels of disclosures in comparison to other companies within the same industry (Deegan *et al.* 2000, p.126).

Magness (2006) examined annual report disclosure of environmental information after a major incident in the Canadian mining industry in 1995. After the mining incident, environmental disclosures were found to increase and companies that faced higher levels of media exposure were found to make greater social responsibility disclosures in the year of the incident (p.558).

Environmental disclosures increased when environmental incidents and penalties were the focus of media attention (Neu *et al*. 1998; Deegan *et al.* 2000). The growing influence of global media ensures that any social and environmental breach is brought to the attention of the public, often instantaneously worldwide. For instance, the internet enhances communication among activist groups and like-minded individuals, empowering them to spread their message while giving them the means to coordinate collective action (Werther & Chandler 2005, p.20). Deegan *et al*. (2000) used media-agenda setting theory to consider the impact of environmental incidents on social and environmental disclosures and found that extensive media coverage has the ability to raise awareness about a particular event (p.109). This suggests if an environmental incident receives high levels of media exposure, stakeholders may impose greater pressure on industries involved in that particular incident. Therefore, one would expect a greater need for those industries to disclose information regarding social and environmental responsiveness.

In sum, legitimacy theory predicts that if a firm's legitimacy is threatened the firm will make self-serving disclosures to repair legitimacy (see Suchman 1995, pragmatic legitimacy), seek to convince stakeholders that they are 'doing the right thing' (see Suchman 1995, moral legitimacy), and gain acceptance from stakeholders for their activities (see Suchman 1995, cognitive legitimacy. It is argued that if a firm is involved in an incident, perceived adversely by the community, there is likely to be a potential threat to the firm's legitimacy and the community may seek to revoke the firm's social contract. The expected response of the firm would be to undertake actions to restore/repair legitimacy (Deegan *et al*. 2002). Further, Clarkson et al (2008) found that firms that were poorer environmental performers were inclined to make 'soft claims' regarding their commitment to the environment. These claims typically were difficult to verify. Claims were made in areas such as strategy and vision for their environment performance, statements of environmental Statements of Policy and commitment and CEO statements on environmental performance to stakeholders. They concluded: it 'implies a greater propensity for "legitimisation" behaviour for firms whose

[3] Exxon Valdez, Kirki, Moura Mine, Union Carbide, and Iron Baron

environmental legitimacy is threatened' (p.324). Significant here is that firms appear to be inclined to make particular types of disclosure when their legitimacy is threatened.

Hypotheses Development

To explore this expectation three hypotheses were posed. Assuming that a firm's legitimacy is threatened, one way to restore legitimacy is to increase social and environmental disclosures in the company's annual reports. The use of social and environmental disclosures in annual reports allows organisations to address the social and environmental concerns of stakeholders or redirect attention away from the negative impact of actions (Patten 1992; Deegan *et al*. 2002). Various literature[4] have utilised legitimacy theory to suggest that the use of social and environmental disclosures in annual reports is linked to the effort by organisations to demonstrate that they are operating in a socially acceptable manner. Firms are expected to act in a responsible way and act to avoid less than desirable impacts on the environment. For example, firms may provide social and environmental information in annual reports to offset negative news publicised by the media, draw attention to past corporate achievements (for instance, environmental awards won) or provide information about corporate attributes previously unknown by the public in order to downplay the negative environmental and social implications caused by the incident (Deegan & Rankin 1996; Wilmshurst & Frost 1999; Deegan *et al.* 2000; Guthrie 2007).

After Suchman (1995) it is hypothesised that Alcoa, as a response to a major incident, one which threatens the legitimacy of the organisation, will respond to legitimacy threats by increasing the level of social and environmental disclosures with the aim of ensuring society's acceptability of its mining operations.

H1: Alcoa will increase the level of its social and environmental disclosures when the legitimacy of the organisation is perceived to be threatened.

It is also expected that other companies in the mining sector will increase the level of social and environmental disclosures to demonstrate that their activities continue to be acceptable (and that such an adverse incident is unlikely to happen to them). Studies have found that a threat of legitimacy to an industry may not be caused by a direct involvement to the incident, but rather to the overall impact of the incident on the perception of society towards the entire industry (Patten 1992; Deegan *et al*. 2000; Guthrie 2007). If a major environmental incident results in a legitimacy threat, legitimacy theory would suggest that companies operating within the mining industry would change their social and environmental disclosures. This change would be consistent with an attempt to respond to potential legitimacy threats that may be directed at other firms within the industry. Therefore it is hypothesised that:

H2: Companies in the Australian mining industry will increase the level of their social and environmental disclosures as a response to a perceived legitimacy threat within the industry.

Deegan *et al.* (2000) found that companies involved in an incident responded with higher levels of social and environmental disclosures than other companies. It is proposed that Alcoa would provide more information in its annual report to demonstrate that the company is concerned about the environment despite the incident caused by its mining activities. Other

[4] See for example Wiseman 1982; Patten 1992; Deegan & Rankin 1996; Wilmshurst & Frost 1999; Deegan et al. 2000, 2002; Cho 2009.

mining companies may not disclose as much information as Alcoa because avoidance tactics such as restricting access their company's practices may be the extent of the organisations' response to any potential legitimacy threats to avoid further public scrutiny (Oliver 1991; O'Dwyer 2002). Alcoa may be discredited to a greater extent than other mining companies because of greater public focus brought upon by media exposure. Companies that maintain a media presence through press releases have been found to make more disclosures in annual reports than companies that operate away from the media spotlight (Brown & Deegan 1999; Deegan *et al*. 2002; Magness 2006). Alcoa may also face the risk of product boycott by society as stakeholders may shift their labour, economical, political, or social support to other companies that adhere by society's expectations (Deegan *et al.* 2000). Therefore it is hypothesised that:

H3: Alcoa will provide more social and environmental disclosures in comparison to other Australian mining companies in their annual reports as a response to a perceived legitimacy threat.

Methodology

Content analysis is undertaken of company annual reports to ascertain the quantity of social and environmental disclosures undertaken in each year and to enable a comparison of before and after impacts on disclosure: two years prior to the incident, the incident year and two years subsequent to the incident. Content analysis has been widely used to examine social and environmental disclosure behaviour (Patten 1992; Gray *et al*.1995b; Deegan & Rankin 1996; Deegan & Gordon 1996; Hackston & Milne 1996; Milne & Adler 1999; Wilmshurst & Frost 1999; Deegan *et al.* 2000, 2002; Unerman 2000; Campbell *et al.* 2003).

Disclosure in annual reports imposes various costs related to collecting, measuring, verifying and publishing information (Cormier & Magnan 1999) therefore management may allocate space to information that is perceived as important in managing their legitimacy (Wilmshurst & Frost 1999; Campbell et al. 2003). It is assumed that the quantity of words represents the level of importance that management places on a certain issue being addressed and the level of responsiveness to legitimise their operations. The focus on the corporate annual report is consistent with previous social disclosure studies (Deegan & Rankin 1996, Brown & Deegan 1999; Deegan *et al*. 2000) since the annual report is the main form of corporate communication (Wiseman 1982; Tilt 1994; Deegan & Rankin 1997; Neu *et al.* 1998), particularly in the case of publicly listed companies. It is also widely accessible by the public in comparison to other corporate reports (Adams & Harte 1998; Wilmshurst & Frost 1999). Previous studies also indicate that various stakeholder groups consider annual reports as their main source of corporate social and environmental information (Tilt 1994; Deegan and Rankin 1996; Deegan *et al*. 2002; Danastas & Gadenne 2006). Annual reports are used as the primary data source for this study because annual reports are produced on a regular basis as part of a company's reporting cycle (Neimark 1992) and since management often possess high levels of editorial control over the content and extent of environmental disclosures in annual reports information (Wilmshurst & Frost 1999), consistency and credibility is ensured as non-annual report information such as media releases may be subjected to the risk of journalistic misrepresentation (Guthrie & Parker 1989; Tilt 1994). For the purpose of this investigation, only annual reports available on the internet (via company websites and Aspect Huntley) are assessed as this study recognises that companies are now supplementing paper-based reports with information published on the internet in order to meet growing demands of customised information and wide accessibility on request to all interested parties

(SustainAbility Reporting Assessment Methodology June 2004b). The exploration undertaken in this study is now being extended to include a broader sample of companies, and other web site based reporting where archival information is provided. One of the problems in using the web as such is that the information is at that point in time, and unless a company maintains accessible archives as they do for annual reports and sustainability reports, it can present difficulties for before and after studies of this nature.

The amount of disclosure is determined by a word count of any sentences (inclusive of headings and captions) that were considered to be of a social or environmental nature. Passages in the annual reports were converted to Word (2007), and counted using the 'word count' tool to ensure a consistent measurement of the number of words was made. The selection of content from the annual reports was initially made by one researcher, and then a selection across a number of sample companies, including the total Alcoa sample, were checked by each of the other researchers. Minimal inconsistencies were noted, and were discussed. Word count is the smallest possible unit of analysis which allows for maximum robustness and minimum errors caused by inconsistencies in calculating quantity of disclosure (Zeghal and Ahmed, 1990). The words count method has received various criticisms such as the arbitrary nature of words (Hackston & Milne 1996) to the possibility of overestimating the volume of distinctive disclosures due to repetitiveness of words (Holder-Webb *et al.* 2009). Nevertheless, studies have shown that analysis using count of words produced results with no significance difference to results produced by methods entailing counts of sentences (Milne & Adler 1999); number of pages and disclosure in pages as a percentage of the total number of pages in the annual report (Deegan & Gordon 1996, p.189).

To facilitate the content analysis, a checklist was designed to systematically record the amount of social and environmental disclosures in eight category statements. The checklist is adapted from a taxonomy of various social and environmental disclosures developed by Hackston and Milne (1996). The original checklist has been adapted to suit the present study. The mining incident gave rise to concerns about the environment therefore the checklist places a particular emphasis on environmental disclosures which include organisational environmental policies and Statements of Compliance, pollution prevention and rectification initiatives. The adapted checklist utilises Deegan and Rankin's (1996, p.56) definition of environmental disclosures which refers to statements "pertaining to the organisations' interaction with the environment. . . the installation of environmentally friendly machinery; undertaking site rehabilitation; recycling activities; admission of pollution emissions; incurrence of fines relating to environmental misdemeanours, and the like". In this study the selection of categories of social and environmental disclosure will also enable comments as to whether Alcoa and the mining companies within the sample make use of particular types of disclosure. It is possible that disclosure will increase more significantly in certain categories than others as a response to the environmental incident, suggesting that companies may use disclosure in a strategic way in responding to stakeholders.

Table 1
Checklist of categories of social and environmental disclosures

Category of Disclosure	Disclosure Statement
Statements of Statements	Statement of corporate governance policies, organisational

of Policy	policies or code of conduct on environmental and social issues
Statements of Compliance	Statement that the firm is compliant with environmental and/or mining laws and codes of conduct (inclusive of environmental audits)
Discussion of Social/Environmental Issues	Discussion of Social/Environmental Issues of environmental and social issues
Discussion of Resource Use	Discussion of Social/Environmental Issues about the effective use of resources in operations e.g. water and energy usage
Pollution Control Initiatives	Pollution Control Initiatives (capital investment, ongoing environmental assessments, research and development expenditure for pollution abatement)
Statements about Environmental Impacts	Statements indicating that environmental impact have occurred from operations
Discussion of Prevention or Repair to the Environment	Discussion of Social/Environmental Issues relating to the Discussion of Prevention or Repair to the Environment to the environment resulting from mining activities such as deforestation, or mining waste management
Compliance with OHS Policies	Statements of Compliance with health and safety standards and regulations and internal employee OH&S policies

Sample

The sample[5] adopted included Alcoa and 30 companies randomly selected from the 404 listed mining companies on the Australian Stock Exchange (ASX) with headquarters and mining operations based in Australia. The sample was limited to companies which operate and are headquartered in Australia because the majority of the negative publicity from media coverage of Alcoa's mining incident is by Australian media which might be expected to influence the perceptions and attitude of the local community towards the Australian mining industry (Brown & Deegan 1999). The public nature and size of companies listed on the ASX is believed to be sufficient for them to attract public attention in relation to their activities (Deegan *et al.* 2000). Thus companies that that are exposed to public scrutiny may face potential threats to their legitimacy in the event of an environmental incident and may therefore be more likely to provide disclosures.

Analytical Framework

Numerical data from annual reports were entered onto a spreadsheet set up with checklist categories by year. Descriptive statistics depicted the basic features of data collected, for example, the average number of words disclosed for each category across time. Analysis was undertaken visually looking at the words of disclosure and then generating descriptive statistics using SPSS V18. The descriptive statistics such as the mean and standard deviation enabled a broad overview of the data. In testing for normality a number of aspects needed to be satisfied. The sample was numerical and interval based, the sample selection was random with the exception of Alcoa as the 'incident company', there was some variation in standard deviations, though as Burns (1998) notes 'within quite wide limits, they (the underlying t-test

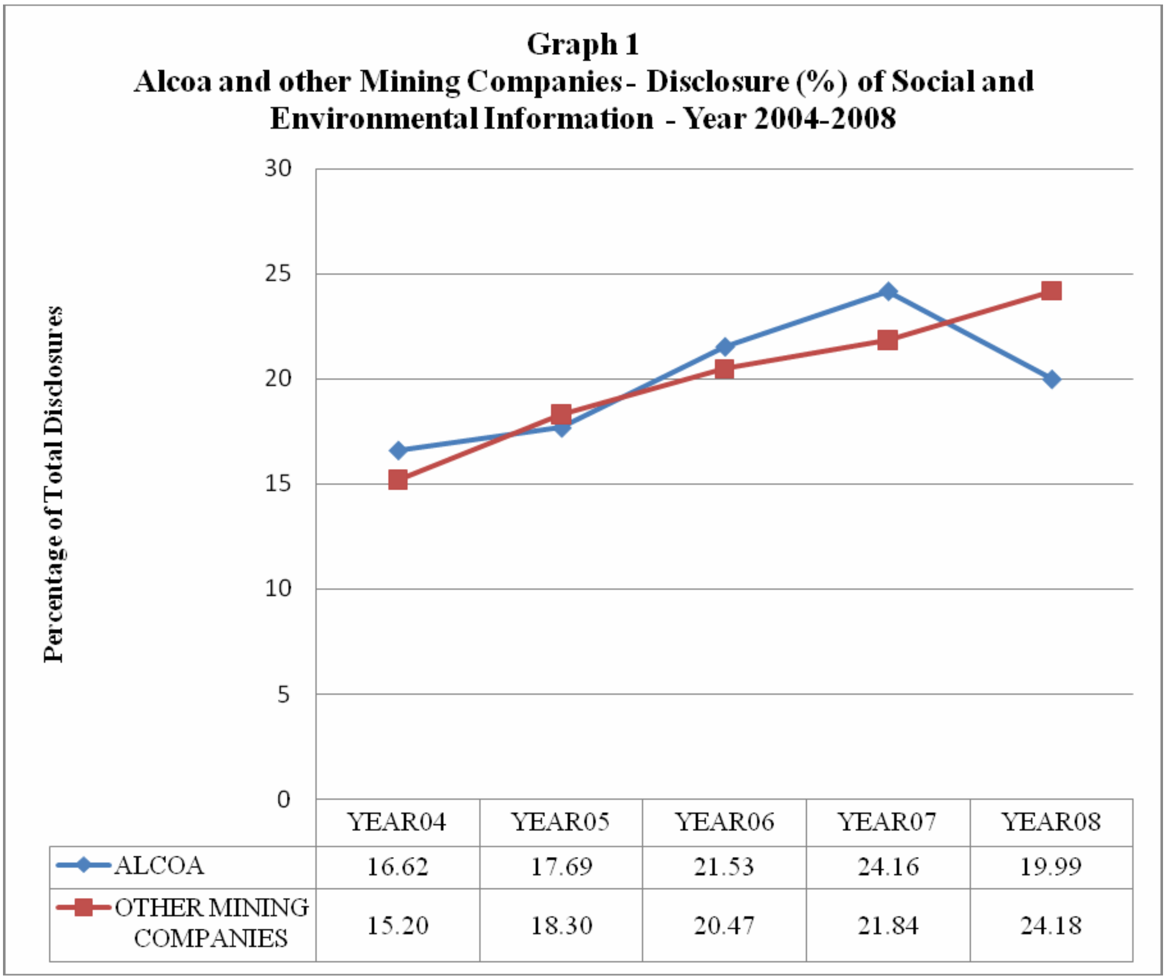
[5] Appendix One – List of Companies in this study

assumptions) can be broken without invalidating the results' (p.160), and the population from which the sample was drawn was normally distributed. The latter was established by the use of histograms with normal curves superimposed. It was found that the data approximated normality (Burns, p.155). As a result parametric t-testing was adopted to assess whether there had been significant increase in reporting disclosures across the time period as identified by the number of reported words both in total and by category of disclosure. A paired sample t-test was undertaken to identify whether there was a significant increase in disclosure after the incident by making a comparison between the before and after reporting periods for Alcoa (Alcoa reports at December 31) and the sample of companies. Since the interest is whether an increase in disclosure across time, and an increase in disclosure after the 'incident' at Alcoa and the random sample of companies occurred single tailed significance was adopted. In this way comment could be made on the nature of the change in reporting in total and by category of disclosure, and whether the incident impacting on Alcoa affected disclosure by Alcoa, and had impacts within the sampled mining companies. This approach is consistent with other social and environmental reporting research (Patten 1992; Deegan & Rankin 1997; Wilmshurst & Frost 1999; Deegan *et al.* 2000; Wilmshurst & Frost 2001).

Analysis

Profile Alcoa and Other Company Sample

Content analysis undertaken indicates that for Alcoa and the sample of mining companies the quantity of disclosure increased across the 2004 to 2008 period. Graph 1 indicates that Alcoa increased disclosures by 4.91% from 2004-2006, with a spike in 2007 to 24.16%, an increase of 2.63% after the incident year. This compares to the industry sample of 5.27% increase from 2004 to 2006, with an increase of 1.37% after the incident to 21.84% in 2007. 2007 was the peak year for disclosures by Alcoa declining to 19.99% in 2008, a drop of 4.17% compared to the industry sample which continued to grow to 24.18%, with a growth in disclosures from 2007 of 4.17%.



Changing levels of disclosure can also be viewed in terms of the types of disclosure (Table 2). In the sample of mining companies including Alcoa, total disclosures rose from 15,688 words in 2004 to 23,963 in 2008. Looking at each year's totals a steady increase is noted. While there were changes in disclosure in each category across time, generally increases were observed in each category. Small decreases were noted in 2006 in Pollution Control Initiatives and Discussion of Prevention or Repair to the Environment. In three categories, Statements of Policy and Discussion of Social/Environmental Issues and Compliance with OHS Policies, disclosures declined in 2008. This study supports the view that social and environmental disclosures have increased across time, and generally in each of the categories examined.

Table 2
Alcoa and Other Mining Companies - Words Disclosed in Total and by Category

Category of Disclosure	2004	2005	2006	2007	2008	Total
Statements of Policy	1517	1918	2007	2035	2008	9485
Statements of Compliance	2399	2813	2825	2724	2996	13757
Discussion of Social/Environmental Issues	1431	1356	1680	1787	1730	7984
Discussion of Resource Use	933	1536	3019	3123	3141	11752

Pollution Control Initiatives	1378	1704	1450	1653	1701	7886
Statements about Environmental Impacts	4614	4737	5791	5905	5983	27030
Discussion of Prevention or Repair to the Environment	2706	3194	3026	3932	5253	18110
Compliance with OHS Policies	1759	2363	2597	2919	2426	12064
Total Disclosures	15688	18300	20971	22726	23963	101648

Reference to Tables 3 and 4 indicates that the increases identified were statistically significant across time for each of the categories of disclosure. Both in terms of an evaluation based on each company in the sample (N=155), and in terms of the total disclosures by all companies in the sample by year (N=5).

Table 3
Alcoa and Other Mining Companies - Total Social and Environmental Disclosure - By Company

Category of Disclosures	Descriptive Statistics (n=155)		t-tests (one tailed/test value=0)		
	Mean	Standard Deviation	t-value	significance	df
Statements of Policy	84.7	113.4	9.304	0.000	154
Statements of Compliance	76.9	59.2	16.166	0.000	154
Discussion of Social/Environmental Issues	123.4	148.2	10.362	0.000	154
Discussion of Resource Use	75.8	177.2	5.327	0.000	154
Pollution Control Initiatives	85.6	174.8	9.095	0.000	154
Statements about Environmental Impacts	121.3	569.8	2.651	0.004	154
Discussion of Prevention or Repair to the Environment	44.9	97.2	5.762	0.000	154
Compliance with OHS Policies	43.1	115.4	4.653	0.000	154

Table 4
Alcoa and Other Mining Companies - Total Social and Environmental Disclosure - By Year

Category of Disclosures	Descriptive Statistics (n=5)		t-tests (one tailed/test value=0)		
	Mean	Standard Deviation	t-value	significance	df

Statements of Policy	1897.0	216.9	19.550	.000	4
Statements of Compliance	2751.4	220.2	27.938	.000	4
Discussion of Social/Environmental Issues	1596.8	191.2	18.669	.000	4
Discussion of Resource Use	2350.4	1041.8	5.045	.003	4
Pollution Control Initiatives	1577.2	152.5	23.128	.000	4
Statements about Environmental Impacts	5406.0	671.7	17.995	.000	4
Discussion of Prevention or Repair to the Environment	3622.2	1016.6	7.967	.000	4
Compliance with OHS Policies	2412.8	424.3	12.714	.000	4

In the next section whether or not differences are noted between Alcoa and the sample of other mining companies is explored and the hypotheses tested.

Disclosures Alcoa 2004-8

Tables 5 provides a breakdown of disclosures for Alcoa by year and by category of disclosure (see Table 1). Table 5 shows actual words of disclosure by year.

Table 5
Alcoa and Other Mining Companies - Paired Sample Testing

Category of Disclosures	Descriptive Statistics (n=5)		t-tests (one tailed/test value=0)		
	Mean	Standard Deviation	t-value	significance	df
2004-2005	-360.5	234.9	-4.342	0.001	7
2005-2006	-346.7	610.5	-1.607	0.076	7
2006-2007	-210.3	306.6	-1.941	0.046	7
2007-2008	-145.0	521.9	-0.786	0.229	7
2004/5-2006	1620.4	1327.0	3.454	0.005	7
2004/5-2006/7	-1395.6	1177.1	-3.353	0.006	7
2004/5-2006/7/8	-4550.4	2322.4	-5.542	0.000	7
205-2006/7	-3362.8	1769.2	-5.376	0.000	7

Table 6

Alcoa - Total words disclosed for each social and environmental category by year

Type of Disclosure	2004	2005	2006	2007	2008
Statements of Policy	24	24	24	24	0

Statements of Compliance	143	143	143	143	146
Discussion of Social/Environmental Issues	252	212	378	456	121
Discussion of Resource Use	55	127	228	285	0
Pollution Control Initiatives	275	457	261	412	105
Statements about Environmental Impacts	2560	2590	3430	3430	3824
Discussion of Prevention or Repair to the Environment	52	100	55	198	0
Compliance with OHS Policies	128	60	0	122	0
Total Disclosures	3489	3713	4519	5070	4196

There had been a continuous increase in disclosure to 2007 (Graph 1) however, consideration of Table 6 highlights different disclosure categories were of different and changing importance. While the category Statements about Environmental Impacts consistently reflected the highest level of disclosure as with category statements Discussion of Social/Environmental Issues, Discussion of Resource Use, Pollution Control Initiatives, and Discussion of Prevention or Repair to the Environment, sizable increases were noted in the year of and after the incident. Interestingly, disclosure for category Statements about Environmental Impacts was consistent for the incident year and subsequent year, and unlike other categories continued to increase disclosure levels in 2008. Between 2005 and 2006, the incident year, disclosures in this category increased slightly over 25%. Overall, between the incident year and the subsequent year total disclosures increased 11%, falling in 2008 almost 20%.

Table 7 provides the descriptive statistics for each category across 2004-2008 and the level of significance of change in disclosures under each category using a parametric t-test. Results indicate that change in the level of reporting for disclosure categories: Discussion of Social/Environmental Issues, Pollution Control Initiatives and Statements about Environmental Impacts were significant. These results indicate that the increasing levels of disclosure for these categories of disclosure were significant across the time period.

Table 7

Alcoa Social and Environmental Disclosures 2004-2008 by year-

Category of Disclosures[6]	Descriptive Statistics (n=5)		t-tests (one tailed/test value=0)		
	Mean	Standard Deviation	t-value	significance	df
Discussion of Social/Environmental Issues	283.8	133.4	4.757	0.004	4
Discussion of Resource	139.00	118.1	2.633	0.029	4

[6] In the assessment of t-tests Statements of Policy and Statements of Compliance were disregarded since between 2004-2007 disclosures remained constant. The cause of any variation was evidenced only by change in the year 2008.

Use					
Pollution Control Initiatives	302.00	139.1	4.856	0.004	4
Statements about Environmental Impacts	3166.80	563.8	12.560	0.000	4
Discussion of Prevention or Repair to the Environment	81.00	74.4	2.435	0.036	4
Compliance with OHS Policies	62.00	62.5	2.217	0.045	4

Using a paired samples t-test (Table 8), a comparative analysis is undertaken to examine whether Alcoa proportionately increased its disclosures in the periods after the mining incident i.e. 2006-2007 and 2007-2008 in comparison to other companies in the same industry due to its direct involvement in the mining incident. Table 6 shows that Alcoa increased their social and environmental disclosures from 4519 words to 5070 words after the mining incident.

Table 8

Alcoa - Paired Samples Test

Change in Disclosures for Alcoa	Descriptive Statistics (n=8)		Paired Samples Test (one tailed)		
	Mean	Standard Deviation	t-value	significance	df
2004-2005	-28.0	76.9	-1.029	0.169	7
2005- 2006	-100.7	317.6	-0.897	0.199	7
2006- 2007	-68.92	64.9	-3.000	0.010	7
2007- 2008	109.2	239.7	1.289	0.119	7
2004/5 - 2006/7/8	-805.1	1920.1	-1.186	0.137	7
2004/5 - 2006/7	-298.5	594.7	-1.420	0.099	7
2005 - 2006/7	-734.6	1441.6	-1.441	0.096	7

This analysis has shown support for the first hypothesis posed: *Alcoa will increase the level of its social and environmental disclosures when the legitimacy of the organisation is perceived to be threatened.* Graph 1 identified an increasing trend in social and environmental disclosures for both Alcoa and the mining industry sample. The results in Graph 1 indicated that the percentage growth in Alcoa disclosures across the 2006-7 time was 6.46% as compared to the mining industry sample of 3.54%. While this is not conclusive evidence of the impact of the incident on Alcoa's disclosure practices it is indicative, particularly if it is compared to the industry sample. Alcoa's disclosure increased at a faster rate than the industry (2.82% in the 2006-7 time). This is important if it is also considered that social and environmental disclosures have generally been increasing since the 1990's. Turning to words of disclosure shown in Table 6, substantial increase in words of disclosure were noted in Discussion of Social/Environmental Issues, Discussion of Resource Use, Pollution Control Initiatives and Statements about Environmental Impacts in the 2006-7 period, and a jump in reporting on Discussion of Prevention or Repair to the Environment in

2007. Interestingly, categories such as Discussion of Social/Environmental Issues, Discussion of Resource Use, Pollution Control Initiatives and Discussion of Prevention or Repair to the Environment fell greatly, and in the case of Discussion of Resource Use and Prevention fell or dropped to zero disclosure. In looking at the categories in which there was change in reported words, two tailed t-tests found significant results for change in Discussion of Social/Environmental Issues, Pollution Control Initiatives and Statements about Environmental Impacts. A paired t-test (Table 5) of the total disclosures addressing before and after the incident yielded a significant result suggesting that Alcoa did respond to the environmental incident by increasing disclosure levels in particular categories. To confirm this result a number of alternative combinations were considered in Table 8. The only t-test yielding a statistically significant result was the 2006 to 2007 period representing a significant 2.63% increase (t=-3.000, sig=0.010) in the period immediately following the incident.

Other Mining Companies 2004-8

Similar to Alcoa the quantity of social and environmental disclosure was calculated for the sample of other mining companies. Table 9 shows that for all categories of disclosure the quantity of disclosure increased between the period 2004 to 2007 other than in the category of Statements of Compliance in 2007, and for categories other than OH & S and Statements about Environmental Impacts in 2008. Interestingly disclosure in the category of Statements of Compliance rose to a new high in 2008.

Table 9

Other Mining Companies - Total words disclosed for each social and environmental category by year

Type of Disclosure	2004	2005	2006	2007	2008
Statements of Policy	1493	1894	1983	2011	2008
Statements of Compliance	2256	2670	2682	2581	2850
Discussion of Social/Environmental Issues	1179	1144	1302	1331	1609
Discussion of Resource Use	878	1409	2791	2838	3141
Pollution Control Initiatives	1103	1247	1189	1241	1596
Statements about Environmental Impacts	2054	2147	2361	2475	2159
Discussion of Prevention or Repair to the Environment	2654	3094	2971	3734	5253
Compliance with OHS Policies	1631	2303	2597	2797	2426
Total Disclosures	13248	15908	17876	19008	21042

In terms of the t-test undertaken, the results shown in Table 10 reveal statistically significant results were found for all categories of disclosure across the 2004-8 time period for overall disclosures by category for the sample of other companies (N=150). This indicates that disclosure in each category increased consistently overtime reflecting a real increase in reporting by this group of companies.

Table 10

Other Mining Companies - Total Social and Environmental Disclosure - By Company

	Descriptive Statistics (n=150)		t-tests (one tailed/test value=0)		
Categories of Disclosures	Mean	Standard Deviation	t-value	sig	df
Statements of Policy	86.9	114.6	9.288	0.000	149
Statements of Compliance	74.6	58.9	15.524	0.000	149
Discussion of Social/Environmental Issues	118.0	146.1	9.896	0.000	149
Discussion of Resource Use	73.7	178.7	5.051	0.000	149
Pollution Control Initiatives	78.3	171.6	5.594	0.000	149
Statements about Environmental Impacts	19.79	73.3	3.306	0.000	149
Discussion of Prevention or Repair to the Environment	43.77	97.8	5.481	0.000	149
Compliance with OHS Policies	42.5	116.8	4.456	0.000	149

Finally, a paired sample t-test (Table 11) was undertaken to assess whether there was a significant difference between the pre and post incident years for 'other mining companies'.

Table 11

Other Mining Companies - Paired Samples Test

Change in Disclosures for Other Companies	Descriptive Statistics (n=8)		Paired Samples Test (one tailed)		
	Mean	Standard Deviation	t-value	significance	df
2004-2005	-332.5	240.7	-3.907	0.003	7
2005-2006	-246.0	479.5	-1.451	0.095	7
2006-2007	-141.5	265.0	-1.510	0.087	7
2007-2008	-254.2	584.9	-1.229	0.129	7
2004/5 to 2006	1410.0	973.3	4.097	0.002	7
2004/5 to 20066/7	-966.0	1051.5	-2.599	0.017	7
2004/5 to 2006/7/8	-3571.3	1830.0	-5.520	0.000	7
2005-2006/7	-2622.0	1027.1	-7.221	0.000	7

In terms of hypothesis two: *Companies in the Australian mining industry will increase the level of their social and environmental disclosures as a response to a perceived legitimacy threat within the industry* Graph 1 shows that for this sample group there was a steady growth in the level of social and environmental disclosure across the time period, unlike Alcoa where disclosure rose above the industry levels from 2006 to 2007, the incident period, and fell to below industry levels in 2008. This continual growth was supported across the various categories of disclosure as shown in Table 9. Generally all categories of disclosure increased across time. The highest growth category appeared to be Discussion of Prevention or Repair to the Environment. T-tests confirmed that the gradual growth in disclosure was significant, while the paired t-test indicated that the growth between the before and after incident period was not significant at the .05 level in assessing the 2006-7 period (t=-1.626, sig.=.074). It would seem that this hypothesis was not supported and the industry did not react to the incident at Alcoa. However, in taking the analysis further, significant results were found when totals were considered. Total disclosure across all categories for 2004/5 compared to 2006 yielded a significant result (t=3.546, sig.=.004), for 2004/5 compared to 2006/7 (t=-2.382, sig.=024), and for 2004/5 compared to 2006/7/8 (t=-4.677, sig.=.001). These results offer some support for the hypothesis that post Alcoa's incident the other mining industry also increased the level of disclosure. This would require further investigation given that these types of disclosures have been increasing across time.

Comparing Alcoa to the Sample Mining Companies

This section provides a comparative analysis of disclosures provided by Alcoa and the mining industry across the 2004-2008 time periods with particular focus on the time period before and after the Alcoa mining incident. In relation to the category statements indicative of social and environmental disclosures Alcoa and the 'other mining companies' generally increased their level of social and environmental disclosures during the period 2004 to 2008 (Table 12). These increases and their significance across the time period were shown in Tables 2, 3 5 and 6 above. Attention in this section turns to the percentage change across the time period in each of the category statements for Alcoa and the 'other mining companies'. These results are reported as percentage change in Table 12 and 13. In terms of Table 12, change has been mixed between the year periods. Alcoa reports at December 31, the incident occurred 14 May 2006. Change in the 2005-6 time period disclosures in the category Discussion of Social/Environmental Issues increased 78%, and in Discussion of Resource Use 80%, while in the period 2006-7 these categories increased a further 21% and 25% respectively. In the 2006-7 period there was a 260% increase in the category Discussion of Prevention or Repair to the Environment, reflecting on Discussion of Social/Environmental Issues relating to the Discussion of Prevention or Repair to the Environment of the environment resulting from mining operations; in the category OH & S relating to Statements of Compliance with health and safety standards and regulations, an increase in disclosure of 122% occurred, and a 58% increase in the category Pollution Control Initiatives disclosures. Interestingly in the 2007-8 period, many disclosures in each category fell as much as 100% reflecting that no disclosure was made for example in Statements of Policy, Discussion of Resource Use, Discussion of Prevention or Repair to the Environment and Compliance with OHS Policies. Alcoa appeared to react to the incident and increased the level of disclosure but in the 2008 period reduced reporting significantly.

Table 12

Alcoa Percentage change in Category Disclosures by Year Group

Category of Disclosure	Year			
	2004-5	2005-6	2006-7	2007-8
Statements of Policy	0	0	0	-100
Statements of Compliance	0	0	0	2
Discussion of Social/Environmental Issues	-16	78	21	-76
Discussion of Resource Use	140	80	25	-100
Pollution Control Initiatives	66	-43	58	-75
Statements about Environmental Impacts	1	32	0	11
Discussion of Prevention or Repair to the Environment	92	-45	260	-100
Compliance with OHS Policies	-53	-100	122	-100

‘0’ reflects no change from the previous year

The results for ‘other mining companies’ is reported in Table 13. In the 2005-6 period disclosures increased 98% in the category Discussion of Resource Use, though this was on the back of increased disclosures in the 2004-5 period of 60%. With the exception of the categories Discussion of Social/Environmental Issues, Pollution Control Initiatives and Discussion of Prevention or Repair to the Environment disclosures, there were no notable increases in the 2006-7, and 2007-8 periods. Of great interest is the category Discussion of Prevention or Repair to the Environment disclosures relating to the Discussion of Prevention or Repair to the Environment to the environment resulting from mining activities which increased by 26% in 2006-7, and a further 41% in 2007-8. By no means was this as great as Alcoa’s increase in 2006-7 but, interestingly the increase continued during 2007-8 while Alcoa chose to discontinue reporting. Of interest, as well, was the increase in disclosures relating to the categories Discussion of Social/Environmental Issues and Pollution Control Initiatives by the ‘other mining companies’ 2007-8, in direct contrast to Alcoa which had increased disclosures during 2006-7 but had chosen to substantially reduce disclosures in 2007-8.

Table 13

Other Mining Companies Percentage Change in Category Disclosures by Year Group

Category of Disclosure	Year			
	2004-5	2005-6	2006-7	2007-8
Statements of Policy	27	5	1.4	-0.15
Statements of Compliance	14	0.45	-4	10
Discussion of Social/Environmental Issues	-3	13	2	21
Discussion of Resource Use	60	98	5	11
Pollution Control Initiatives	13	6	4	29
Statements about Environmental Impacts	5	10	5	-13
Discussion of Prevention or Repair to the	17	-4	26	41

Environment				
Compliance with OHS Policies	41	13	8	-13

'0' reflects no change from the previous year

The final hypothesis posed: *Alcoa will provide more social and environmental disclosures in comparison to other Australian mining companies in their annual reports as a response to a perceived legitimacy threat.* As noted in the section above 'other mining companies' showed a fairly consistent growth in disclosure across the time period with a decline in a number of categories in 2008. On the other hand, in the categories of Statements of Policy and Statements of Compliance, Alcoa's reporting was fairly consistent across time, with strong growth in Discussion of Social/Environmental Issues, Discussion of Resource Use, Pollution Control Initiatives, Environmental Impact and Discussion of Prevention or Repair to the Environment across the 2006-7. This growth and then decline in disclosure is noted in Graph1. This hypothesis would be supported in terms of the spike noted. However, significant growth in disclosure was noted across the industry over the time period.

Conclusions

This paper investigated change in disclosure across eight categories of social and environmental reporting between 2004 and 2008. The focus of the paper was to explore the impact on disclosure in total, and in each category of disclosure, of the impact of an environmental incident, specifically a mining incident at Alcoa's alumina plant at Wagerup, WA. In line with a number of other studies (Patten 1992; Deegan & Rankin 1996; Walden & Schwartz 1997; Deegan *et al*. 2000, 2002; Cho 2009) the interest was to identify whether the level of disclosure changed subsequent to the mining incident for Alcoa, and the mining industry. In addition this paper explored whether the change in disclosure occurred across specific categories of disclosure, for example, evidenced by increased Discussion of Social/Environmental Issues of environmental issues, Discussion of Social/Environmental Issues relating to Pollution Control Initiatives and/or actions taken to prevent future damage, or repair existing damage to the environment from mining activities.

It was anticipated that for both Alcoa and the sample drawn from other mining companies that disclosures would most likely increase as a response to stakeholder concerns, and a potential threat to legitimacy resulting from these concerns. That is, as a result of the environmental incident disclosures were made to address concerns raised as the acceptability of both Alcoa and the mining industry's activities were brought into question. Alcoa reacted to restore legitimacy. The mining industry reacted to maintain legitimacy. The evidence indicated that the mining incident was not deemed to be acceptable to the community, if for no other reason, than the health issues that arose. Charges laid by the Department of Environment and Conservation, prompted by complaints from stakeholders, the local residents. Wider interest was activated and evidenced, for example, by the presence and interest of Erin Brokovich. It would appear that Alcoa had breached their 'social contract' by allowing an unacceptable mining incident to occur, and to impact on the surrounding community to the detriment of that community.

Data was collected adopting content analysis and counting words of disclosure in total and by category of disclosure. Results indicate that social and environmental disclosures overall had increased throughout the 2004-2008 period for the mining industry, though had fallen for Alcoa in 2008. While Tables 2, 6 and 9 above provide the in-depth detail of disclosure patterns, Table 14 provides a summary.

Table 14
Yearly Disclosures for Alcoa and the Other Mining Companies'

Year of Disclosure	2004	2005	2006	2007	2008
Alcoa	3489	3713	4519	5070	4196
		6%	22%	12%	-17%
Other Mining Companies	13248	15908	17876	19008	21042
		20%	12%	6%	11%
Total Disclosures	16737	19621	22395	24078	25238
		17%	14%	8%	5%

Looking at the growth in disclosure between years, Alcoa's disclosures increased 22% to the December 31st reporting date in 2006, and a further 12% to December 31st 2007. Given that reporting to December 31st 2005 increased by only 6%, and to December 31st 2008 declined 17% , together with the evidence discussed in regard to disclosure categories and significance testing it would seem reasonable to accept that hypothesis one was supported. That is, Alcoa did increase disclosure in response to the mining incident further evidenced by disclosures reducing in total at December 31st 2008 by 17%. A paired sample t-test revealed a significant result for the period ended December 31st 2007 (t=-3.000, sig. .010). Categories of disclosure (Table 12) also provided evidence to support this belief, for example, with a 260% increase (2006-2007) in reporting on Discussion of Prevention or Repair to the Environment, declining to zero in 2008, Pollution Control Initiatives increased 58% (2006-2007), then declined 75% to 2008 once the perceived legitimacy threat had passed.

On the other hand, the evidence was far less clear for hypothesis two. While the actual number of words increased for the 'other mining companies' sampled, the percentage growth slowed from 20% at the reporting date in 2005 to 11% at the reporting date in 2008. Linked to the Discussion of Social/Environmental Issues above in relation to the categories of disclosure, and statistical testing, hypothesis two was not supported. It would appear that across the period 'other mining companies' did increase disclosure, though at slower growth rates in total, but did not appear to respond to the environmental incident at Alcoa. Paired sample t-tests revealed significant results 2004-2005 (t=-3.907, sig.. 003), 2004/5-2006 (t=4.097, sig. .002), 2004/5-2006/7/8 (t=--5.520, sig. .000), and 2005-2006/7 (t=-7.221, sig. .000). Results suggested increasing disclosure across time but not necessarily a reaction to an incident affecting a member of the industry. In considering table 13 the category Discussion of Prevention or Repair to the Environment increased 26% to December 31st 2007, and a further 41% to December 31st 2008. In the light of these results hypothesis two was rejected.

In terms of hypothesis three, it was proposed that Alcoa was likely to provide greater levels of social and environmental disclosure in response to a perceived legitimacy threat than the other mining companies sampled. While the mining industry increased disclosure in total, and by category the increase was gradual (in terms of words reported), and as shown in Table 14 growth in reporting was at a declining percentage rate. Equally there was no spike in disclosure subsequent to the mining incident at Alcoa in May 2006. In terms of Alcoa, Graph 1 indicated a spike in disclosure after the mining incident and the paired sample t-test indicated a significant increase in disclosure in the 2006 to 2007 time period. Table 12 and 13 identify the percentage change in disclosure for Alcoa (Table 12), and for the 'other mining companies' (Table 13) across each time period. In terms of Alcoa the highest percentage change noted in words disclosed was for 2006 to 2007 in the category – Discussion of Prevention or Repair to the Environment, that is, Discussion of Social/Environmental Issues in relation to the Discussion of Prevention or Repair to the Environment to the environment relating to mining activities (260%) as compared to the 'other mining companies', showing a 26% growth in disclosure for the same period. Hypothesis three is supported: Alcoa did provide more social and environmental disclosure in comparison to other Australian mining companies in their annual reports as a result of a perceived legitimacy threat.

This result provides additional support to the general consensus among researchers that all kinds of social and environmental reporting is increasing and will continue to increase over time (Gray *et al* 1995; Wilmshurst & Frost 2000; Deegan *et al* 2002).

Support for Legitimacy Theory

The results of the analysis are consistent with legitimacy theory which implies that in situations where a firm perceives that the acceptability of its operations are brought into question, and this has been seen to have a detrimental effect on the perceptions by stakeholders of the firm, that action will be taken to restore that legitimacy. One such corrective legitimising strategy is to increase the level of voluntary corporate disclosure to show and communicate that the firm is acting to address the concern. As noted when discussing support for hypothesis one, actual words of disclosure indicated that there was a spike in disclosure within the annual report after the mining incident, as supported by t-tests which indicated that within a number of categories of disclosure significant positive change had taken place. In the categories of Discussion of Social/Environmental Issues about social and environmental issues, the effective use of resources, Pollution Control Initiatives, statements indicating that activities had resulted in Statements about Environmental Impacts, and Discussion of Social/Environmental Issues relating to the prevention and repair to the environment resulting from mining activities, significant results were found. Further in the case of Discussion of Prevention or Repair to the Environment a 260% growth in disclosure was noted in the period after the mining incident (2006-7), yet had reflected reduced disclosure in the period prior to (2005-6, decline 45%), and the second period after the mining incident (2007-8, decline 100%). A paired sample t-test also yielded a significant result for the period 2006 to 2007, the post incident time period. It could be argued that this is not only supportive of reaction to a perception that legitimacy has been threatened, but also a pragmatic (Suchman, 1995) approach to the threat by addressing stakeholder concerns in the annual report in the immediate reporting period subsequent to the incident. In particular, there would be a need to give increased attention to Discussion of Social/Environmental Issues relating to Discussion of Prevention or Repair to the Environment of damage caused.

This result also provides additional support to prior studies which has found that published corporate disclosures play a role in seeking to change the perception of stakeholders particularly when the firm has been involved in an event that is likely to negatively affect the legitimacy of its operations (Wiseman 1982; Patten 1992; Deegan & Rankin 1996; Deegan *et al*. 2000, 2002; Cho 2009). Alcoa's decline in disclosure in 2008 may also indicate that a company's disclosure strategy is purposive, calculated and often oppositional with management assuming a high level of control over the legitimation process (Suchman 1995, p.576). Since management often possess high levels of editorial control over the content and extent of environmental disclosures, the decision to make disclosures is often strategic in nature. The other mining companies sampled would appear to be acting to maintain their legitimacy overtime by increasing disclosures given the expectation that social and environmental reporting takes place.

Environmental disclosures may allow organisations to address the social and environmental concerns of stakeholders that have the ability to influence the legitimate position of the company. These disclosures may also draw attention to past corporate achievement or provide information about corporate attributes previously unknown by the public. For example, Alcoa provided more information that discussed the impact of mining operations and long term Pollution Control Initiatives undertaken to offset reports to negative news publicised by the media. The willingness of Alcoa to provide more information about the negative impact of its operations after the mining incident provides an alternative observation to Deegan and Rankin's (1996) study which demonstrated firms that faced legitimacy threats, such as prosecution by the EPA, provided little disclosure either for the prosecution itself or concerning any environmental information with a negative impact.

This study gives an indication of the areas of disclosure that may increase as a result of an environmental incident. In the case of Alcoa increased disclosure was noted in the area of prevention, Discussion of Resource Use, Compliance with OHS Policies, Discussion of Social/Environmental Issues, Pollution Control Initiatives and Statements about Environmental Impacts. The majority of these increases were statistically significant between 2006 and 2007. Disclosure by Alcoa increased in the time period after the incident. On the other hand, for the industry, while disclosure increased across the time period it did not appear to be related to the incident at Alcoa. In comparison to the industry Alcoa disclosed more information in response to the mining incident. It would appear likely that increased disclosure was a response to a perceived legitimacy threat and was evidenced by increased disclosure, with increased disclosure in specific categories such as Discussion of Social/Environmental Issues of social and environmental issues, initiatives in regard to Pollution Control Initiatives, environmental impact of activities and actions to prevent or repair Statements about Environmental Impacts.

Limitations and Further Research

A number of limitations need to be borne in mind. The focus was on annual report disclosures although other mediums of disclosure do exist, hence future research could explore the implications of sustainability reports and web based disclosures. The sample was limited, and random selection resulted in the inclusion of few larger mining companies. The researchers have already commenced collection of a broader and more robust data set, including web medium within this expanded data collection. While this study is indicative of the impact of an incident's effect on disclosures, and the role that legitimacy theory may play, it is not conclusive.

References

ABC Perth (2007), ‘Erin Brockovich vs Alcoa’, *Health ABC.net*, 6 August, viewed on 3 August 2009, < http://www.abc.net.au/local/stories/2007/08/06/1997683.htm>.

About Greenpeace International, History of Greenpeace 1995- The Brent Spar, *Greenpeace International*, viewed 7 July 2009, < http://www.greenpeace.org/international/about/history/the-brent-spar>.

Adam CA & Harte G (1998), 'The changing portrayal of the employment of women in British banks' and retail companies' corporate annual reports', Accounting, Organisations and Society, vol 23, no.8, pp 781-812.

Adler, RW & Milne, MJ (1997), "Media exposure, company size, industry, and social disclosure practices", *Fifth International Perspectives on Accounting IPA Conference*.

Australian Securities Exchange (ASX), *Company Search 2009*, viewed on 27 August 2009, <http://www.asx.com.au/research/companies/index.htm>.

Brown, N & Deegan, C (1999), ‘The public disclosure of environmental performance information: a dual test of media agenda setting theory and legitimacy theory’, *Accounting and Business Research*, vol.29, no.1, pp.21–41.

Burns, R. (1998). *Introduction to Research Methods* 3rd Ed. Longman.

Business Day (2009), ‘Alcoa to fight pollution charge’, *WA Today*, 23 July, viewed on 9 August 2009, < http://www.watoday.com.au/business/alcoa-to-fight-pollution-charge-20090723-duhn.html>.

Campbell, D (2003), ‘Intra and inter sectoral effect in environmental disclosures: evidence for legitimacy theory’, *Business Strategy and the Environment*, vol.12, pp.357–37.

Campbell, D, Craven, B & Shrives, P (2003),’Voluntary social reporting in three FTSE sectors: a comment on perception and legitimacy’ *Accounting, Auditing & Accountability Journal*, vol.16, no.4, pp.558–581.

Cho, C (2009), ‘Legitimation Strategies Used in Response to Environmental Disaster: A French Case Study of Total SA’s Erika and AZF Incidents’, *European Accounting Review*, vol.18, no.1, pp.33–62.

Clarkson, P.M., Y. Li, G.D. Richardson, F.P. Vasuan. (2008) Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. Accounting Organisations and Society. vol..33. pp.303-327.

CNN Science and Space (2003), Prestige spill may hurt Spain for 10 year’, *CNN.com International*, 6 November, viewed on 2 August 2009, <http://edition.cnn.com/2003/TECH/science/11/06/spain.prestige.reut/>.

Cormier, D, Magnan, M (1999), ‘Corporate environmental disclosure strategies: determinants, costs and benefits’, *Journal of Accounting, Auditing and Finance*, vol.14 no.3, pp.429–451.

Danastas, L & Gadenne, D (2006), ‘Australian social and environmental NGOs: a study of their influencing activities on corporate social disclosure’, *The Journal of Corporate Citizenship* , vol.Autumn 2006, no.23, pp.53–66.

Deegan, C. (2006) , Financial Accounting Theory, 2nd Edition, McGraw-Hill Australia

Deegan, C (2002), ‘Introduction: the legitimising effect of social and environmental disclosures – a theoretical foundation’, Accounting, Auditing & Accountability Journal, vol.15, no.3, pp.282–311.

Deegan, C & Blomquist, C (2006), ‘Stakeholder influence on corporate reporting: an exploration of the interaction between WWF-Australia and the Australian minerals industry’, *Accounting, Organisations and Society*, vol.31, pp.343–372.

Deegan, C & Gordon, B (1996), ‘A study of the environmental disclosure practices of Australian corporations’, *Accounting and Business Research*, vol.26, no.3, pp.187–199.

Deegan, C & Rankin, M (1996), ‘Do Australian companies report environmental new objectively? An analysis of environmental disclosure by firms prosecuted successfully by the Environmental Protection Authority’, *Accounting, Auditing & Accountability Journal*, vol.9, no.2, pp.52–69.

Deegan, C, Rankin, M & Voght, P (2000). ‘Firms’ disclosure reactions to major social incidents: Australian evidence’, *Accounting, Auditing & Accountability Journal*, vol.9, no.2, pp.50–67.

Deegan, C., Rankin, M., Tobin, J. (2002), "An examination of the corporate social and environmental disclosures of BHP from 1983-1997: a test of legitimacy theory", *Accounting, Auditing & Accountability Journal*, vol.15 no.3, pp.312–43.

Department of Environment and Conservation News (2007), ‘Alcoa Convicted for Unauthorised Discharge’, *Department of Environment and Conservation*, 22 June, viewed on 28 July 2009, < http://www.dec.wa.gov.au/news/department-of-environment-and-conservation/alcoa-convicted-of-unauthorised-discharge.html>.

Dowling, J. and Pfeffer, J. (1975). Organisational legitimacy: social values and organisational behaviour. *Pacific Sociological Review*. V.18/1. Pp.122-36.

Driscoll, C. and Crombie, A. (2001). Stakeholder legitimacy management and the qualified good neighbour: the case of Nova Nada and JDI. *Business and Society*. V.40/4. pp.442-71.

Flint, J (2006), ‘Alcoa expands despite toxins’, *Perth Now-News.com.au*, 11 September, viewed 4 August 2009, <http://www.news.com.au/perthnow/story/0,21598,20391434-2761,00.html>.

Gosch, E (2007), ‘Alcoa site scares Erin Brockovich’, *The Australian*, 7 August, viewed 28 July 2009, viewed on 5 August 2009, <http://www.theaustralian.news.com.au/story/0,25197,22200713-23289,00.html>.

Gray, R., Kouhy, R. and Lavers, S. (1995a), ‘Corporate social and environmental reporting: a review of the literature and a longitudinal study of UK disclosure’, *Accounting, Auditing & Accountability*, vol.8, no.2, pp.47-77.

Gray, R., Kouhy, R. and Lavers, S. (1995b), ‘Methodological themes: constructing a research database of social and environmental reporting by UK companies’, *Accounting, Auditing & Accountability*, vol.8, no.2, pp.78-101.

Guthrie, J (2007), ‘Legitimation strategies in Australian mining extended performance reporting’, *Journal of Human Resource Costing & Accounting*, vol.11, no.3,pp.156–177.

Guthrie, JE & Parker, LD (1989), ‘Corporate social reporting: a rebuttal of legitimacy theory’, *Accounting and Business Research*, vol.19, no.76, pp.343–352.

Hackston, D & Milne, MJ (1996), "Some determinants of social and environmental disclosures in New Zealand companies", *Accounting, Auditing & Accountability Journal*, vol.9, no.1, pp.77–108.

Holder-Webb L, Cohen, JR, Nath, L & Wood, D (2009), ‘The supply of corporate social responsibility disclosures among U.S. firms’, *Journal of Business Ethics*, vol.84, no.4 pp.497–527.

Hoogheimstra (2000), ‘Corporate communication and impression management-new perspectives why companies engage in corporate social reporting,’ *Journal of Business Ethics*, vo.27, no1-2, pp.55–69.

James S (2008), ‘Klaus Kleinfeld to succeed Belda as Alcoa CEO’, *Reuters.com*, 8 May 2008, viewed on 27 September 2009, <http://www.reuters.com/article/companyNews/idUSWNAS299520080508>.

Kaplan, S.E. and Ruland, R. G. (1991). Positive theory, rationality and accounting regulation. *Critical Perspectives on Accounting*. V.2/4. pp.361-74.

Lococo, E (2009), ‘Alcoa’s Faster-Than-Expected Cost Cuts Yield Profit Update3, *Bloomberg News*, 8 October, viewed on 25 September 2009, <http://www.bloomberg.com/apps/news?pid=20601103&sid=aqF87MO26ieI>.

Macdonald-Smith, A (2008), ‘Rio Tinto, Alcoa Score Worst in WWF Carbon Report Update2’, *Bloomberg News*, 4 September, viewed on 28 July 2009, <http://www.bloomberg.com/apps/news?pid=20601081&sid=aXt6iPx1U0UY&refer=australia>,

Magness, V (2006), ‘Strategic posture, financial performance and environmental disclosure: an empirical test of legitimacy theory’, *Accounting, Auditing and Accountability Journal*, vol.19, no.4, pp.540–563.

Matthew, MR (1993), *Socially Responsible Accounting*, Chapman and Hall, London.

Milne, MJ & Adler, RW (1999), ‘Exploring the reliability of social and environmental disclosures content analysis’ *Accounting, Auditing & Accountability Journal*, vol.12, no.2, pp.237–56.

Moore, A (2007), ‘Brockovich arrives in Perth for Alcoa case’, *Lateline Business ABC.net*, 6 August, viewed on 9 August 2009, < http://www.abc.net.au/lateline/business/items/200708/s1998200.htm>.

Napsha, J (2007), ‘Activist Erin Brockovich takes stand against Alcoa’, *Tribune-Review Pittsburghlive.com*, 14 August, viewed on 25 July 2009 <http://www.pittsburghlive.com/x/pittsburghtrib/s_522047.html>.

Neu, D, Warsame, H& Pedwell, K (1998), ‘Managing public impressions: environmental disclosures in annual reports’', *Accounting, Organisations and Society*, vol.23 no.3, pp.265–82.

NineNews (2007), ‘Alcoa pleads not guilty to polluting WA’, *NineNews Finance*, 23 July, viewed on 31 July 2009, < http://news.ninemsn.com.au/mobile/business/840937/alcoa-pleads-not-guilty-to-polluting-wa?_sp=2045&_s=FFFFFFFF-FFFF-FFFF-FFFF-FFFFFFFFFFFF>.

O'Dwyer, B (2002), ‘Managerial perceptions of corporate social disclosure: an Irish story’, *Accounting, Auditing & Accountability Journal*, vol.15, no.3, pp.406–436.

Oliver, C (1991), ‘Strategic responses to institutional processes’, *Academy Management Review*, vol.16, no.1, pp.145–179.

Patten, D (1992), ‘Intra-industry environmental disclosures in reponse to the Alaskan oil spill: a note on Legitimacy Theory, *Accounting, Organisations and Society*, vol, 17, no.5, pp.471–475.

Patten, D. M. (1991). ‘Exposure, legitimacy and social disclosure’,. *Journal of Accounting and Public Statements of Policy*, vol.10, no.5, pp.23–34.

Patten, DM (2002), ‘The relation between environmental performance and environmental disclosure: a research note’, *Accounting, Organisations and Society*, vol.27, no.8, pp.763–773.

Pearson, CM & Clair, JA (1998), ‘Reframing crisis management’, *The Academy of Management Review*, vol.23, no.1, pp.59–76 .

Ritson A (2005), ‘Aluminium maker Alcoa shows its mettle’, *BBC News*, 10 April, viewed on 3 August 2009, < http://news.bbc.co.uk/2/hi/business/4389577.stm>.

Ryle, G (2002), ‘The great red mud experiment that went radioactive’, *Sydney Morning Herald*, 7 May, viewed on 31 July 2009, < http://www.smh.com.au/cgi bin/common/printArticle.pl?path=/articles/2002/05/06/1019441476548.html>.

Sapienza, J (2009), ‘Alcoa delays plea on pollution charges’, *WA Today*, 23 April, viewed on 28 July 2009, < http://www.watoday.com.au/wa-news/alcoa-delays-plea-on-pollution-charges-20090423-ag8p.html>.

Shocker, A & Sethi, S (1974), ‘An approach to incorporating social preferences in developing corporate action strategies’, in Sethi, S. Ed., *The Unstable Ground: Corporate Social Statements of Policy in a Dynamic Society*, Wiley, New York, NY.

Suchman, M (1995), ‘Managing legitimacy: strategic and institutional approaches’, *Academy of Management Review*, vol.20, no.3, pp.571–610.

Suchman, M. C. 1988. *Constructing an institutional ecology: Notes on the structural dynamics of organizational communities.* Paper presented at the annual meeting of the American Sociological Association, Atlanta, GA.

The Australian (2008), ‘Erin Brockovich mining giant Alcoa West Australia refinery’, *The Australian*, 29 February, viewed on 4 August 2009, <http://www.theaustralian.news.com.au/story/0,25197,23298057-2702,00.html>.

Tilling, M.V. and Tilt, C.A. (2010), The edge of legitimacy: Voluntary social and environmental reporting in Rothman’s 1956-1999 annual reports. *Accounting, Auditing and Accountability Journal*. V23/1. pp.55-81.

Tilt, C., (1994), ‘The Influence of External Pressure Groups on Corporate Social Disclosure Some Empirical Evidence”, *Accounting, Auditing and Accountability Journal,* vol.7, no.4, pp.47 - 72.

Time Magazine (2002), The Prestige Oil Spill-2002, Photo Essays, *Time.com*,20 November, viewed 1 August 2009, <http://www.time.com/time/photoessays/oilspill/>.

Towie N (2008), ‘Alcoa charged with criminal negligence’, *Perth Now-News.com.au,* 13 December, viewed on 2 August 2009, < http://www.news.com.au/perthnow/story/0,21598,24795019-5017007,00.html>.

Towie N (2008), ‘Toxic ties to Alcoa’, *Perth Now-News.com.au*, 2 November, viewed on 2 August 2009, <http://www.news.com.au/perthnow/story/0,27574,24594868-2761,00.html>.

Towie N (2009), ‘Crusader Erin Brockovich saw 'genuine fear' in Yarloop’, *Perth Now-News.com.au*, 20 June, viewed on 6 August 2009, <http://www.news.com.au/perthnow/story/0,, 25665256-2761,00.html>.

Towie N (2009), ‘Mining giant Alcoa denies pollution charge at Wagerup refinery’, *Perth Now-News.com.au*, 23 July, viewed on 7 August 2009, <http://www.news.com.au/perthnow/story/0,21598,25823930-5017962,00.html>.

Unerman, J (2000), ‘Methodological Isssues:reflections on quantification in corporate social reporting analysis’, *Accounting, Auditing & Accountability Journal*, vol.13, no.5, pp.667–680.

Walden, WD, & Schwartz, BN (1997), ‘Environmental disclosures and public Statements of Policy pressure’, *Journal of Accounting and Public Statements of Policy*, vol.16, no.2, pp.125–154.

Werther, B. W. & Chandler, D. (2006), S*trategic Corporate Social Responsibility: Stakeholders in a Global Environment*, Thousand Oaks, Sage.

Wilmshurst T, & Frost G (2001), 'The Role of Accounting and the Accountant in the Environmental Management System', *Business Strategy and the Environment*, vol.10, no.3, pp.135-147.

Wilmshurst, TD & Frost, GR (1999), ‘Corporate environmental reporting: a test of legitimacy theory’, *Accounting, Auditing & Accountability Journal*, vol.13, no.1, pp.10–26.

Wiseman, J (1982), ‘An Evaluation of Environmental Disclosures Made in Corporate Annual Reports’, *Accounting, Organisations and Society*, vol.7, no.1, pp.53 - 63.

Zeghal, D & Ahmed, SA (1990), ‘Comparison of Social Responsibility Information Disclosure Media Used by Canadian Firms’, *Accounting Auditing & Accountability*, pp.38–53.

Zimmerman, M & Zeitz, G (2001), ‘Beyond survival: Achieving new venture growth by building legitimacy’, *Academy of Management Review*, vol.27, no.3, pp.414–431.

Appendix One

Australian Mining Companies Included in this Study

ASX Code	Company	Mining Sector	Firm Size by Market Capitalisation ($m)
AAI	Alcoa Inc	Aluminium	39,837
MOL	Moly Mines Ltd	Copper & Molybdenum	121
GSE	Goldsearch Ltd	Gold, Nickel & Uranium	17
RDR	Reed Resources Ltd	Vanadium, Nickel & Vanadium	82
PCP	Paramount Mining Corporation Ltd	Diamond	9
BAR	Barra Resources Ltd	Gold, Nickel & Cobalt	45
RSG	Resolute Mining Ltd	Gold & Base Metals	255
AVO	Avonlea Minerals Ltd	Gold	452
MMN	Macmin Silver Ltd	Silver	40
GGY	Glengarry Resources Ltd	Uranium & Gold	16
ARH	Australasian Resources Ltd	Magnetite Ore	221
PEM	Perilya Ltd	Zinc,Lead & Silver	189
GRR	Grange Resources Ltd	Magnetite Ore	288
ALK	Alkane Resources Ltd	Diamond & Gold	117
RNG	Range River Gold Ltd	Gold	61
WME	West Australian Metals Ltd	Uranium & Gold	76
AVA	Aviva Corporation Ltd	Coal	9
RAU	Republic Gold Ltd	Gold	37
GDA	Gondwana Resources Ltd	Gold	24
RDM	Red Metal Ltd	Uranium, Copper & Base Metals	21
MRX	Matrix Metals Ltd	Copper	80
DOM	Dominion Mining Ltd	Gold	401
PDY	Padbury Mining Ltd	Gold	37
SRL	Straits Resources Ltd	Copper	398
ORH	Orh Ltd	Iron	10
NAV	Navigator Resources Ltd	Gold	45
WVL	Windimurra Vanadium Ltd	Vanadium	90
MDX	Mindax Ltd	Uranium & Gold	57
AAM	A1 Minerals Ltd	Gold	34
AQD	Ausquest Ltd	Copper Gold	41
OST	Onesteel Ltd	Iron	4,357