Differences in auditors’ materiality assessments when auditing financial and non-financial reports

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Abstract

Investors and other stakeholders are paying more attention to the environment and in response there is an increasing trend for companies to voluntarily report and obtain assurance on their sustainability activities. In these assurance engagements the issue of what is material is critical to the assurance process. Research on materiality has focused on financial report audits and so little is known about auditor materiality assessments in other assurance engagements. This paper reports the results of an experiment where audit managers and seniors assess the materiality of audit differences of the same magnitude for a financial statement audit and a sustainability (water) assurance engagement. Two factors, the risk of breaching a contract and community impact, are manipulated between-subjects. We find that the risk of breaching a contract has a greater impact on auditor’s materiality assessment when assuring water accounts than when auditing financial statements. The breach effect for the water case is stronger when there is no local community impact than when there is a local community impact.

Keywords: materiality, auditor judgments, non-financial assurance, water accounting

JEL: M42

Data Availability: Data and the tasks used in this study are available on request.
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INTRODUCTION

Materiality has been considered a key concept in both audit theory and practice for many decades (Holstrum and Messier, 1982; Messier et al., 2005). Previous research has exclusively considered traditional financial statement auditing (Messier et al., 2005) and has not considered auditor materiality judgments in other assurance engagements. These other assurance engagements are becoming common (Simnett et al., 2009; KPMG, 2011; O’Dwyer et al., 2011) but little is known about the judgments auditors make in these types of engagements, and how and when they differ from financial statement audit judgments.

While sustainability reporting has been in existence for a long period (e.g., Trotman and Bradley, 1981), the frequency and amount of information presented has increased substantially in recent years with many large companies not only presenting this information in their annual reports but also preparing separate sustainability reports, often 100 pages in length or more (see, for example, Alcoa 2010b; BHP 2011b). The number of sustainability reports has grown tenfold in the last five years with over 50% of the companies in the KPMG (2011) survey having prepared sustainability reports in the past or planning to have one prepared in the near future. An increased number of sustainability reports are receiving third party assurance (O’Dwyer, 2011; Ernst & Young, 2010; KPMG, 2011) with the Big 4 gaining a growing market share (O’Dwyer et al. 2011).

O’Dwyer (2011) notes there has been a significant amount of recent research in sustainability assurance practice. Typically this research has analyzed the content of assurance reports to better understand the broad practice of assurance (e.g., Cooper and Owen, 2007; Simnett et al., 2009). However, there is a lack of research examining the processes used by sustainability assurors when

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1 Internationally the term ‘assurance’ engagements is used. They are comparable to US ‘attribution’ engagements.
2 Sustainability reports have previously been labelled as social responsibility accounting, environmental reporting and triple bottom line reporting. More recently, the term “Environmental, Social and Governance” is used.
producing their reports (O’Dwyer et al., 2011). O’Dwyer et al. (2011) and O’Dwyer (2011) adopt an in-depth case study approach to gain an understanding of the processes through which Big 4 sustainability assurance practitioners seek to legitimize this new area of practice and of the nature and dynamics surrounding practitioners’ efforts to operationalize sustainability assurance. To better understand the judgments of assurance providers we take an alternative approach by employing a controlled experiment to examine the factors that are expected to impact auditor materiality judgments.

ISAE 3000 (IAASB, 2005) provides guidance on assurance engagements other than audits or reviews of financial statements. Two major differences when making materiality assessments for financial statements under ISA 320 compared to assessments under ISAE 3000 are differences in the role of users and the weight allocated to qualitative versus quantitative factors. First, under both ISA 320 and ISAE 3000 auditors are advised to identify intended users and their needs in establishing and assessing materiality. For financial statements of for profit-orientated entities (ISA 320), investors are considered the primary intended users. For other assurance engagements (ISAE 3000) the intended users are much broader and not as easily identified.

Second, while for financial statement audits and other assurance engagements there is a need to consider the impact of qualitative factors when setting and assessing materiality, quantitative thresholds are much more precise for financial statement audits than for other assurance engagements. For financial statement audits, examples of appropriate benchmarks and factors that may impact the choice of a benchmark are provided (ISA 320.A3-.A7). While it is stated that materiality involves the exercise of professional judgment, ISA 320.A3 notes that a percentage is often applied to a chosen benchmark as a starting point. Five percent of profit-before-tax from continuing operations is given as an example of a materiality calculation often used by auditors of for profit-orientated entities, with the caveat that higher or lower percentages may be appropriate in some circumstances (ISA 320.A4 and A7). For other assurance engagements, ISAE 3000 states that
materiality is considered in the context of quantitative and qualitative factors (including the interests of intended users) when assuring non-financial information and that the relative importance of quantitative and qualitative factors for a particular engagement is a matter of professional judgment (ISAE 3000.23). While qualitative factors are more apparent in the discussion of materiality in ISAE 3000 than in ISA 320, previous research has not considered how and when qualitative factors impact materiality judgments on other assurance engagements.

We selected assurance of water accounting disclosures as the other (non-financial) assurance engagement context for our study. Our choice was based on the importance internationally of water and the significant increase in reporting of its use. In the USA the impact of water scarcity and the impact of declining water quality on businesses has been significant (Ceres, 2010). The impact affects demands in company’s water allotments, resulting in higher costs of water, greater regulation and growing community and public scrutiny of company water usage (Ceres, 2009). In Australia there is even greater emphasis on water usage with water being scarcer there than in any other country outside Antarctica (Committee for Economic Development of Australia (CEDA) 2011). Consequently the Water Accounting Standards Board (WASB) was established in Australia in 2007 and in 2010 it issued a water accounting standard AWAS1 (WASB, 2010). To complement this standard the Australian Auditing and Assurance Standards Board (AUASB) teamed with WASB to develop a Consultation Paper: Assurance Engagements and General Purpose Water Accounting Reports (AUASB, 2011). We chose water assurance as opposed to other assurance engagements, such as carbon emissions, as it is likely to be of significant future importance (see new water accounting standards) but at this point in time few auditors have experience in this specific type of engagement and audit firms have not developed specific assurance programs for water reporting. This is a situation where the auditor can use their tacit knowledge of how to conduct an assurance

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3 This definition of materiality is consistent with the definition used for financial statements but no guidance is provided on an appropriate benchmark or threshold to use when assessing quantitative materiality (paragraph 17). The standard refers to the importance of qualitative materiality and notes that the nature of information (rather than its value) may be sufficient to define its materiality (paragraph 18). The Consultation Paper: Assurance Engagements and General Purpose Water Accounting Reports (AUASB, 2011) provides the same materiality guidelines when assuring water.
engagement when faced with vague guidance from non-financial assurance standards (O’Dwyer, 2011). However, O’Dwyer finds that there are impediments to transferring financial statement auditing techniques to other assurance services.

In this study we manipulate the type of engagement (financial statements versus water statements) within-subjects and two qualitative factors between-subjects: risk of breaching a contract (present/absent) and community impact (the content of the reports does/does not impact the local community in which the company operates). Eighty-two audit managers and seniors were provided information for both a financial statement audit and a water assurance engagement. The cases each contain an error of the same magnitude uncovered by the auditor. Participants were asked to assess the materiality of the error in the financial statement case and the error in the water case. The results show that the risk of breaching a contract has a greater impact on auditor materiality assessments for the water case than the financial case; for the water case auditors assess materiality significantly higher where an audit difference places a client at risk of breaching a contract than where this risk is absent. We also find that this breach effect for the water case is stronger in the no community treatment than in the community treatment.

Our study makes a number of important contributions to the audit/assurance literature. First, it extends the study of auditor materiality judgments from financial statement audits (Messier et al., 2005) to assurance of sustainability (water) statements. This is important given the considerable move towards assurance of sustainability statements, an area where little is known about important audit judgments. Second, it extends the study of qualitative materiality to a setting where there is little guidance. Previous experimental research on financial statement materiality judgments has shown that qualitative factors are important (Libby and Kinney, 2000; Ng and Tan, 2003) in situations where audit differences do not reach a 5% materiality threshold. Here we extend this research to examine the impact on both financial and sustainability assurance of a qualitative factor (breach of a covenant) for an amount which is between 5% and 10% of a benchmark. At thresholds between 5%
and 10%, the professional guidance given to auditors is that the materiality assessment is a matter of professional judgment. Third, given the importance of other users in sustainability assurance, we manipulate whether both the financial statement and the sustainability information are likely to impact only investors or both investors and local community groups. Local community groups are important when they are known to be affected by company activities and as a consequence closely monitor company activities via various means including company financial and sustainability reports.

BACKGROUND AND DEVELOPMENT OF HYPOTHESES

Investors are paying more attention to the environment when making investment decisions (Al-Tuwaijri et al., 2004; Koellner et al., 2005; Simnett et al., 2009; KPMG, 2011). A variety of stakeholders, including investors, employees and consumers, are concerned about environmental performance (Van der Laan et al., 2008; Ernst and Young, 2011; KPMG, 2011) and accounting for water in particular (Ceres, 2009, 2010; Godfrey and Chalmers 2012) as well as financial performance. In response to stakeholder demand there is an increasing trend for companies to voluntarily report (Clarkson et al., 2008; KPMG, 2011) and assure (Coram et al., 2009; Simnett et al., 2009; Ernst & Young, 2010; O’Dwyer, 2011; O’Dwyer et. al., 2011) environmental disclosures. Assurance enhances the perceived credibility of non-financial disclosures (Free et al., 2009; Moroney et al., 2012) and companies use assurance to build their corporate reputation (Simnett et al., 2009).

Auditors assure both financial and environmental disclosures and may have different mental models and approaches when working in different contexts (Ng and Tan, 2007; Free et al., 2009; O’Dwyer, 2011; O’Dwyer et. al., 2011). Prior research has shown that because people have limitations in their ability to process information they use knowledge structures based on past experience to process new information (Palmer and Pickett, 1999; Mathieu et al., 2000). Experience brings the opportunity to develop mental models which aid decision making (Hammersley, 2006) and as a consequence of their training and past experiences, auditors bring to each engagement a mental model of the range of factors that impact their materiality assessments. Ng and Tan (2007) suggest that each auditor has
a qualitative materiality threshold, which impacts their judgment when assessing the materiality of a quantitatively immaterial audit difference.

Using professional judgment, auditors assess whether audit differences are material and should be booked by their client. In making this assessment an auditor will consider the magnitude of the difference, user information needs and qualitative materiality factors (ISA 320; ISAE 3000). An audit difference is considered material if it is likely to impact the judgments of report users (Holstrum and Messier, 1983; Tuttle et al., 2002; Messier et al., 2005; DeZoort et al., 2006). When an audit difference is large (above the materiality threshold) and objectively assessed there is likely to be consistency in auditor materiality assessments indicating that the amount is material (Tuttle et al., 2002; DeZoort et al., 2003). When an audit difference falls below the materiality threshold and is subjectively assessed auditor materiality assessments are less consistent (DeZoort et al., 2006; Ng and Tan, 2007; Ng, 2007).

A number of qualitative factors can influence these materiality judgments including the nature of an audit difference (for example, changing a profit to a loss) (Tuttle et al., 2002) and the subjectivity of an audit difference (Braun, 2001). Ng and Tan (2007) find that auditors are more likely to assess a quantitatively immaterial audit difference as material, and require that the difference be booked, if it impacts a client’s ability to meet analyst forecasts and Ng (2007) finds that auditor book or waive decisions of quantitatively immaterial audit differences are affected by the impact of the difference on a client’s ability to meet various earnings thresholds such as a client’s ability to report positive earnings and recent earnings followed by analysts’ expectations. DeZoort et al. (2006) find that auditor materiality assessments are affected by accountability pressure in that auditors under closer scrutiny are more conservative and less variable in their assessments. Overall, this body of research indicates that for financial statement audits, materiality assessments and book or waive decisions of quantitatively immaterial audit differences (i.e. less than 5% of net profit-before-tax) are affected by qualitative factors. In this study we selected audit differences above 5% and below 10% as this is the
range when auditors have discretion to use their professional judgment over whether the amount is quantitatively material and these judgments are expected to be impacted by qualitative factors.

Mining companies can borrow funds with debt covenants attached. Such agreements place certain limits on company operations. For example, a company may be required to keep their debt to equity level below a threshold or maintain their earnings-per-share at a particular level. Mining companies can also enter into licensing agreements with water rights attached (AWAS1; Minerals Council of Australia, 2006) to secure water to meet their production needs. Under such agreements companies are entitled to withdraw a capped amount of water each year. In both of these situations a breach of contract would be considered a qualitative factor (ISA 320; ISA 3000) and would be expected to impact the materiality judgment. Specifically, when an audit difference places a client at risk of breaching a contract (for example, a debt covenant or a licensing agreement) an audit difference is likely to be assessed as more material than in the absence of such a risk.

H1a An audit difference that places a client at risk of breaching a contract is expected to be assessed as significantly more material than an audit difference of the same magnitude that does not place a client at risk of breaching a contract.

When conducting a financial statement audit, auditors are expected to be mindful of the impact of an audit difference on key thresholds such as profit-before-tax which are discussed in the audit standards (ISA 320). They are also likely to be mindful of the impact of an audit difference on investors. When assuring water disclosures, key thresholds and primary users are less clear because they are not set out in the standards or professional guidance (ISAE 3000; WASB, 2010; AUASB, 2011). Auditors are more likely to waive audit differences, which are subjectively derived, compared to objectively derived (Nelson et al., 2002, 2005; Ng, 2007) indicating that auditor materiality assessments are impacted by the subjectivity of an audit difference. Because non-financial assurance standards are more subjective than financial statement audit standards, we would expect auditors assess a water statement audit difference as less material than a financial statement audit difference, all other things being equal.
We expect the impact of qualitative factors, such as covenants, to have a greater impact on water materiality assessments than financial statement materiality assessments. First, our case involves an error of 6.6% of net profit-before-tax. This is within the range where auditors can use professional judgment when deciding whether the amount is material. Many financial statement auditors will decide that this amount is material (i.e. greater than 5%) regardless of the information on covenants. For water statements, auditors are much less likely to consider an error of the same magnitude to be as material given the lack of quantitative guidelines and therefore covenants are likely to have a much larger impact. Second, when auditing a financial statement, auditors are aware of the impact of their materiality assessment of an audit difference on reported earnings and user decision making (Braun, 2001; Ng, 2007). However, when assuring a water statement the impact of an audit difference on user decision making is less obvious in the absence of qualitative factors (such as breaches of covenants) which make the impact of an audit difference more apparent. Breach of covenants is expected to have a greater impact on auditor materiality assessments when assuring water than when auditing a financial statement.

H1b The risk of breaching a contract is expected to have a greater impact on auditor materiality assessments when assuring water than when auditing a financial statement.

For financial statement audits, materiality judgments are based on a consideration of the common financial information needs of users as a group (ISA 320.2). Financial statements that meet most of the needs of investors will also meet the needs of other users (ISA 320.2). This suggests that the presence of a community group would not necessarily impact financial statement materiality judgments. For ‘other assurance engagements’ ISAE 3000 takes a broader approach to users with substantial reference to the term ‘intended users’ recognizing that “there may be intended users other than those to whom the assurance report is addressed” and that “intended users may be limited to major stakeholders with significant and common interests” (ISAE 3000.A16). This suggests that the ‘community group’ in our study would be included as an intended user under this definition and would be expected to impact other assurance engagement (water) materiality judgments. ISAE
3000.A86 further notes “misstatements ... are considered material if they ... could reasonably be expected to influence relevant decisions of intended users” and that consideration of materiality is a matter of professional judgment and is impacted by perceptions of the common information needs of intended users (ISAE 3000.A86). Based on the above differences we expect the inclusion of a community group to have a greater impact on auditor materiality assessments when assuring water than when auditing financial statements.

H2 An identified community group is expected to have a greater impact on auditor materiality assessments when assuring water than when auditing financial statements.

Further, we expect that the effect of the breach of a water covenant and, therefore, the difference between financial statement and water materiality judgments, will vary depending on the presence/absence of a community group. In the presence of a community group the breach is likely to have less impact as the community group is likely to already make the amount of the error material in the minds of the auditors. On the other hand in the absence of the community group there is no other qualitative factor likely to increase the water materiality assessment and therefore the impact of the breach of covenant is likely to have more impact in this situation than in the presence of a community group.

H3 The risk of breaching a contract is expected to have a greater impact on the difference between financial statement and water materiality assessments, in the absence of a community group compared to the presence of a community group.

RESEARCH DESIGN

Participants

Eighty-two (82) auditors from three of the Big 4 accounting firms took part in this study.⁴

Participants comprised thirty-four (34) seniors and forty-eight (48) managers with an average 5.2

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⁴ Eighty-six (86) auditors completed the experimental materials. Four failed a manipulation check and were removed from the analysis. There is no difference in the statistical conclusions if these participants are included.

⁵ An ANOVA with audit firm as a covariate was run for differences in participant materiality assessments for the financial and water cases. Between firm differences are not significant (p=0.689).
years audit experience (ranging from 1.5 to 15 years). Participants were assured confidentiality and were each given a $50 gift voucher for taking part in the study. Fourteen participants had experience in sustainability assurance. Partners at participating firms informed us that participants have the knowledge to carry out the requested judgments for both the financial and water cases.

The experiment was conducted in the offices of the participating firms. Participants were invited to take part by a senior partner from each firm. The same researcher was present for each experimental session ensuring consistency of instructions. Participants were randomly allocated to one of the treatments.

**Experimental task**

The case materials were developed with input from audit partners at the participating firms. The materials included two cases (a financial statement case and a water case) for two different clients. The financial task was based upon mining company financial statements. The water task was based upon AWAS1 (WASB, 2010) and various water accounting publications issued by the Minerals Council of Australia (2006, 2009, 2010). The independent variables considered in the current study are the risk of breaching a contract and the presence of a community group. These factors were chosen with reference to financial and water accounting publications (ISA 200; ISA 320; ISAE 3000; Minerals Council of Australia, 2006; AWAS1), financial and water disclosures by mining companies (for example, Alcoa, 2010a, 2010b; BHP, 2011a, 2011b; Bluescope Steel 2011a, 2011b; Fortescue Metal Group, 2011; Newcrest Mining, 2010; Orica, 2011; Rio Tinto, 2010a, 2010b) and following discussions with audit partners regarding the types of events that are likely to be important to auditors when auditing financial statements and when assuring water disclosures.

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6 ANOVAs with level (manager or senior) and then years of audit experience as covariates were run for differences in participant materiality assessments for the financial and water cases. Level (manager or senior) (p=0.625) and years of audit experience (p=0.494) are not significant.
After reading an introductory statement, which provided basic instructions on the order to do each case and ensuring anonymity, participants completed the two cases and then exit questions (manipulation checks and demographic details). Each case included background information about a client, a newspaper article (which provided facts about the relationship between the client and the local community), client disclosures (excerpts of the client’s financial statement or sustainability report), information on the potential breach, and a description of an audit difference. The background information, client disclosures and audit differences were held constant between participants.

Across all treatments and in both cases the audit difference was 6.6% of the relevant base. In the financial case the base was profit-before-tax and in the water case the base was fresh water withdrawn and used in production. The percentage and base were selected following consultation with audit partners while developing the case. Regarding the percentage chosen, it was important that the amounts not be greater than 10% of the relevant bases, otherwise it is likely that all judgments would indicate that the amount was material. If the amounts were less than 5% of the relevant bases there was a risk that the water audit difference would be considered equally immaterial in all treatments. After considerable consultation with partners we chose a materiality level in the lower part of the 5% to 10% range as it was the most likely range where qualitative factors are likely to be important in non-financial assurance engagements.

The bases were chosen after consultation with audit partners from the participating firms on what were the most appropriate bases for financial statements and water statements. In the financial case, a graph was provided for profit-before-tax over three years and an excerpt of the financial statement included sales, expenses and profit-before-tax. In the water case, a graph was provided for fresh water withdrawn over three years and an excerpt of the sustainability report included

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7 The cases were in two separate envelopes marked A and B. Participants were asked to complete the case contained in envelope A first and then the case contained in envelope B, without reference to the case in envelope A. Case order was randomised between-subjects. There were no order effects for the financial (t=0.105; p=0.917) or the water case (t=0.809; p=0.421). Exit questions were in a separate envelope marked C.
details of fresh and poor water withdrawn for production. In the financial case reference is made to the need to achieve an amount of profit-before-tax to meet the earnings per share target specified in the debt covenant. In the water case reference is made to a cap being placed on the amount of water that can be withdrawn in line with a licensing agreement.

The background information was consistent across the clients in the two cases. Both clients were described as being large listed mining companies, profitable, committed to maximizing long term shareholder wealth, with return on equity an important key performance indicator. Participants were asked to assume the role of an audit manager and were told that the companies had been clients of their firm for the last three years.

At the end of each case, participants were asked to respond to three requests. First, participants were asked to assess the materiality of the audit difference described in the case. Specifically, participants were asked whether failure to correct the error (audit difference) would make the financial statement (water disclosures) materially misstated. Participants were provided an eleven point scale marked ‘Definitely NOT materially misstated’ at zero and ‘Definitely materially misstated’ at 10. These materiality assessments are used to test the hypotheses. Second, participants were asked to nominate the maximum dollar (megalitre) amount of understatement of expenses (freshwater withdrawn) that would be immaterial. Third, participants were asked to list the key factors from the case that impacted their decisions. Responses to the second and third questions are discussed in the supplementary analysis section of the paper.

**Design**

To test the hypotheses outlined in this paper a (2)x2x2 design was used. Type of engagement was manipulated at two levels within-subjects: financial and water. The risk of breaching a contract was manipulated at two levels between-subjects. Community impact was also manipulated at two levels between-subjects.
As type of engagement was manipulated within-subjects, financial statement materiality assessments act as a control against which the water materiality assessments can be compared. For the risk of breaching a contract treatment, in the breach version of the case materials, participants were told that the clients were at risk of breaching a contract if the audit difference was booked. In the no breach version of the case materials participants were told that the clients were not at risk of breaching a contract if the audit difference was booked.

Where the client was at risk of breaching a contract, this information followed the client disclosures in the case materials:

For the financial case, it is noted that the company took out a significant loan with a debt covenant attached but by earning in excess of $205m in 2011 the company met all targets stipulated in the covenant. For the water case, the company has a licensing agreement with water rights attached. According to that agreement Oresome is entitled to withdraw up to 8,200 megalitres of freshwater in 2011.

The following information then followed the description of the audit difference in the case materials for the financial/water case:

If the financial statements/sustainability report are/is adjusted for the audit difference the client will breach their debt covenant/exceed their water entitlement.

For the non-breach treatment participants were provided the same information about the debt covenant and licensing agreement except that the debt covenant specified earnings in excess of $180m (instead of $205m as described above in the financial case) and the licensing agreement specified an entitlement of 10,000 megalitres (instead of 8,200 megalitres as described above in the water case). Following the description of the audit difference, participants in the non-breach treatment were informed that booking the audit difference would still allow the client to meet the target set in their debt covenant (financial case) and remain within their water entitlement (water case).
For the community treatment, the community version of the case materials included newspaper articles explaining that a local community is impacted by client activities.

Both newspaper clippings used strong language to make the strength of community impact apparent to participants. In the financial case, the newspaper article referred to the reliance of the local community on jobs provided by the mine owned by the company. The job cuts announced by the mine were going to impact families, who could move away from the local township. In the water case, the newspaper article referred to a meeting of local farmers who claimed that the company was responsible for the withdrawal of excess freshwater to use in its mining activities, depriving farmers of this precious resource. Participants are told that the meeting was organized to raise public awareness of the amount of water withdrawn and used by the mine owned by the company. Both articles include quotations from locals who are angry with the mines and their activities. The no community version of the case materials included newspaper articles explaining that there was minimal local community impact from the client’s operations.

RESULTS

Descriptive statistics are included in Table 1. The table includes details of overall participant materiality assessments in each cell (Total), which are broken down by case type, financial (Fin) and water (Water), followed by the difference in the financial and water case means (Diff). In all four cells the materiality assessment is greater for the financial case than for the water case. The gap between the two is smallest in the breach/community treatment (0.26) and greatest in the no breach/no community treatment (1.90). Figure 1 includes a graph of the differences in participant materiality assessments using the difference (Diff) data in Table 1.

[Insert Table 1 here]

[Insert Figure 1 here]
The results for the (2)x2x2 ANOVA with the assessment of materiality as the dependent variable are shown in Panel A of Table 2. The main effect for the within subject variable, type of engagement (financial or water), is significant (F=8.446, p=0.005). Breach is significant (F=5.238, p=0.025) and the interaction between type of engagement and breach is significant (F=4.033, p=0.048). The results for community are not significant (F=0.143, p=0.707).

[Insert Table 2 here]

H1a predicts that an audit difference that places a client at risk of breaching a contract will be assessed as significantly more material than an audit difference of the same magnitude that does not place a client at risk of breaching a contract. To test this hypothesis a comparison is made between the materiality assessments for participants across both cases in the breach treatment (cells 1 (7.91) and 2 (8.08) in Table 1) and the materiality assessments for participants in the no breach treatment (cells 3 (7.29) and 4 (6.80) in Table 1). The planned contrast testing H1a in Panel B of Table 2 shows that this difference is significant (t=2.587, p=0.006) providing support for H1a.

H1b predicts that the risk of breaching a contract will have a greater impact on auditor materiality assessments when assuring water than when auditing a financial statement. To test this hypothesis the within-subject difference in materiality assessments (Diff in Table 1) for the financial and water cases is used. The gap between an auditor’s financial statement and water materiality assessments is expected to be greater when there is no risk of a breach than when there is a risk of a breach. A comparison is made between the breach (cells 1 (0.26) and 2 (0.28) in Table 1) and no breach (cells 3 (1.05) and 4 (1.90) in Table 1) differences in materiality assessment. The planned contrast testing H1b in Panel B of Table 2 compares the difference for the breach cells and the no breach cells. The difference between the cells is significant (t=2.008, p=0.024) supporting H1b.8

8 Given the significant interaction between type of engagement and breach (Panel A of Table 2, F=4.033, p=0.048) we consider whether the differences in materiality assessments in Figure 1 are significantly different from zero. In the breach condition the differences between the materiality assessments for the
To highlight the differences in auditor materiality assessments when auditing financial and water reports, Table 3 and Figure 2 include separate ANOVAs, contrasts and graphs for the financial and water cases. Panel A of Table 3 and Panel A of Figure 2 include the results for the financial case; the ANOVA shows that neither of the treatment variables nor their interaction significantly impact auditor materiality assessments for the financial case (p>0.456). Panel B of Table 3 and Panel B of Figure 2 include the results for the water case. The results of the ANOVA demonstrate a significant main effect for breach (F=7.933, p=0.006) but a non-significant result for community (F=0.460, p=0.500) and for the interaction between breach and community (F=0.942, p=0.335).

[Insert Table 3 here]

[Insert Figure 2 here]

Panel C of Table 3 includes a replication of the planned contrast for testing H1b for the financial and the water cases separately. For the financial case, the cell 1 and 2 mean materiality assessments (8.04 and 8.22) (Table 1) are not significantly different to the cell 3 and 4 means (7.81 and 7.75) (Table 1) (t=0.748, p=0.228) (Panel C of Table 3). For the water case, the cell 1 and 2 mean materiality assessments (7.78 and 7.94) (Table 1) are significantly different to the cell 3 and 4 means (6.76 and 5.85) (Table 1) (t= 2.816, p=0.003) (Panel C of Table 3). This analysis provides additional support for H1b and shows that when an audit difference is between 5 and 10% of a base, the risk of breaching a contract impacts auditor materiality assessments when auditing a water statement but not a financial statement.

H2 predicts that the presence of an identified community group will have a greater impact on auditor materiality assessments when assuring water than when auditing a financial statement. The

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financial and water cases are not significantly different from zero. The mean difference is 0.26 when there is a community effect (t=0.41, p=0.69) and 0.28 for the no community treatment (t=0.51, p=0.62). In contrast, in the no breach condition the differences between materiality assessments are significantly different from zero (community treatment: mean=1.05, t=2.06, p=0.05; no community treatment: mean=1.90, t=2.88, p=0.01).
planned contrast testing H2 in Panel B of Table 2 indicates that this difference is not significant 
(t=0.725; p=0.236). Panel C of Table 3 includes a replication of the planned contrast for testing H2 
for the financial and the water cases separately. The results are not significant for both the financial 
case (t=0.126; p=0.450) and the water case (t=0.678; p=0.250), which is consistent with the analysis 
above.

H3 predicts that breach of covenants will have a greater impact on the difference between financial 
and water materiality assessments in the absence of a local community than in the presence of a 
local community. To test H3 we conduct a contrast test with the weights -2 in the ‘breach + 
community’ and ‘breach + no community’ conditions, +1 in the ‘no breach + community’ condition, 
and +3 in the ‘no breach + no community’ condition. The contrast weights not only include a main 
effect of breach, but also incorporate a specific interaction pattern between our manipulated factors 
(absence/presence of community group). The weights for the breach cells are negative and the 
weights for the no breach cells are positive. This reflects the expectation that the difference 
between financial and water materiality assessments will be lower in the breach cells than in the no 
breach cells. The weight in the ‘no breach + no community’ condition is greater than the weight in 
the ‘no breach + community’ condition reflecting the expectation that the breach treatment will 
have a greater impact in the absence of a local community than in the presence of a local 
community.

The contrast testing H3 provides a powerful test for an ordinal interaction (Buckless and Ravenscroft, 
1990; Rosnow and Rosenthal, 1995). In line with our expectations, Figure 1 demonstrates that the 
gap between the breach and no breach lines is greater when there is no community impact than 
when there is a community impact. The result in Table 2 Panel C for this contrast support H3 
(t=2.217, p=0.015). This result shows that in addition to the main effect of breach, the effect of 
breach is stronger in the absence of community than in its presence. As a robustness test, we also 
test the alternative contrast scheme (-1,-1,-1,+3) comparing those in the no breach/no community
cell (1.90, Table 1) with the other three cells (0.26, 0.28 and 1.05, Table 1) which also satisfies the predicted pattern in H3. The contrast test is significant (t=1.97, p=0.025, one tail, not tabulated).

We also tested the simple effect of breach in the absence/presence of community and the simple effect of community in the absence/presence of breach (Panel C of Table 2) for the difference in the mean materiality assessments for the financial and water cases. Results suggest that in the absence of community, breach has a significant effect on the difference in the financial and water materiality assessments (t=1.847, p=0.07, two-tailed), while in the presence of community, breach has no significant effect (t=0.964, p=0.34, two-tailed). The results support our expectations for H3 that in the presence of a community group the breach is likely to have less influence on an auditor’s materiality assessment as the community group is likely to already have some impact on materiality in the minds of the auditors. In the absence of the community group there is no other qualitative factor likely to increase the water materiality assessment.

Table 3 Panel C replicates the testing of H3 for the financial and water cases separately. The contrast test with the weights +2 in the ‘breach + community’ and ‘breach + no community’ conditions, -1 in the ‘no breach + community’ condition, and -3 in the ‘no breach + no community’ condition is conducted to test the ordinal interaction. The weights for the breach cells are positive and the weights for the no breach cells are negative. This reflects the expectation that the water materiality assessments will be higher in the breach cells than in the no breach cells. The negative weight in the ‘no breach + no community’ condition is greater than the negative weight in the ‘no breach + community’ condition reflecting the expectation that the breach treatment will have a greater impact in the absence of a local community than in the presence of a local community.

Figure 2 demonstrates that the gap between the breach and no breach lines is greater when there is no community impact than when there is a community impact for the water case only (Panel B). For the financial case the relevant contrast is not statistically significant (t=0.732, p=0.233) but for the water case it is statistically significant (t=3.029, p=0.002). As a robustness test, we also test the
alternative contrast scheme (+1,+1,+1,-3), comparing the materiality assessments in the no breach/no community cell with all other cells. The result is insignificant for the financial case (t=0.502, p=0.309, one tail, not tabulated) and significant for the water case (t=2.56, p=0.006, one tail, not tabulated).

Follow-up simple effects testing (Panel E of Table 3) show that the effect of breach is significant in the absence of community (t=2.58, p=0.01) for the water case but insignificant in the presence of community (t=1.36, p=0.18). We also test the simple effect of community in the absence/presence of breach and find that both effects are insignificant (t=1.17, p=0.25 absence effect; t=0.02, p=0.84 presence effect) for the water case. All four simple effects are insignificant for the financial case (Panel D Table 3, p ≥ 0.50).

CONCLUSION

It is becoming more common for companies to report on their sustainability performance. Much of the research into non-financial reporting, including sustainability reporting, has focused on the nature of the information provided and the contribution made by assurance to enhance the credibility of disclosed information. There has been no research to date on how auditor judgments vary when assuring sustainability rather than financial information. Similarly, research into auditor materiality assessments, a key component of every audit, has focused on financial statement audits. There has been no research to date on how auditor materiality assessments vary when assuring sustainability rather than financial information.

The aim of this paper was to learn more about auditor materiality judgments when assuring sustainability information. In particular, we focus on the conditions under which financial and sustainability materiality assessments are expected to be similar or vary. An experiment was conducted in the offices of Big 4 accounting firms. All of these firms assure sustainability reports as well as auditing company financial statements. Participant audit managers and seniors completed
two cases, a financial case and a water case. Participants were asked to assess the materiality of an audit difference held constant at 6.6% of the relevant base across the two cases. We chose this materiality after considerable consultation with audit partners as it was the most likely range where a difference would be expected. Two factors were manipulated between-subjects, the risk of breaching a contract and the presence of a local community.

Results reveal that when an audit difference is between 5 and 10% of a base, an audit difference that places a client at risk of breaching a contract is assessed as significantly more material than an audit difference that does not place a client at risk of breaching a contract. Further analysis reveals that this risk has a greater impact on auditors when assuring water than when auditing financial statements. Further, the breach effect for the water case is stronger when there is no local community impact than when there is a local community impact.

The research reported here makes an important contribution to audit and assurance literature. It extends materiality research by looking beyond financial statement audits. It considers the impact of qualitative factors applicable to non-financial as well as financial audits. It reflects on the circumstances when auditor judgments are expected to vary and when they are expected to be similar. It identifies the qualitative factor most apparent to auditors when assuring non-financial (water) disclosures.

Our study has a number of limitations which create opportunities for future research. First, all our participants had financial statement audit experience, but few had experience with water accounting assurance. As this experience evolves further within the firms, new expertise, new guidelines and decision aids are likely to appear. Second, we chose amounts which were 6.6% of two particular bases (net profit before tax and freshwater withdrawn). While partners suggested these bases were appropriate, other bases may be used by individuals. Third, the choice of the 6.6% percentage had the benefit of being in the area where a judgment needs to be made about whether it is material. Previous studies have shown that qualitative factors for financial audits have a bigger
impact for less than 5% of profit. Differences between water and financial materiality assessments may impact these differences. Fourth, we chose the local community for our manipulation of other user groups and results may vary with the user group chosen.
REFERENCES


Ceres. 2010. The ripple effect: Water risk in the municipal bond market. Ceres, Oakland USA.

Clarkson, P.M., Y. Li, G.D. Richardson, and F.P. Vasvari, 2008. Revisiting the relation between environmental performance and environmental disclosure: an empirical analysis, Accounting, Organizations and Society 33, 303-327.


Ernst & Young, 2010, Action amid uncertainty: The business response to climate change, United Kingdom.


Figure 1

Difference in materiality assessments:
Financial case minus water case

![Graph showing difference in materiality assessment between breach and no breach cases.](image-url)
Panel A: Financial case

Figure 2

Materiality assessment

Panel B: Water case
TABLE 1
Descriptive Statistics for materiality assessments
Mean (Standard deviation)

<table>
<thead>
<tr>
<th>Breach</th>
<th>Community</th>
<th>No Community</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Fin</td>
</tr>
<tr>
<td></td>
<td>7.91</td>
<td>8.04</td>
</tr>
<tr>
<td></td>
<td>(2.09)</td>
<td>(2.34)</td>
</tr>
</tbody>
</table>

Cell 1 (n=23)

<table>
<thead>
<tr>
<th>Breach</th>
<th>Community</th>
<th>No Community</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Fin</td>
</tr>
<tr>
<td></td>
<td>7.29</td>
<td>7.81</td>
</tr>
<tr>
<td></td>
<td>(2.62)</td>
<td>(2.20)</td>
</tr>
</tbody>
</table>

Cell 3 (n=21)

<table>
<thead>
<tr>
<th>Breach</th>
<th>Community</th>
<th>No Community</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Fin</td>
</tr>
<tr>
<td></td>
<td>7.94</td>
<td>8.08</td>
</tr>
<tr>
<td></td>
<td>(2.28)</td>
<td>(2.10)</td>
</tr>
</tbody>
</table>

Cell 2 (n=18)

<table>
<thead>
<tr>
<th>Breach</th>
<th>Community</th>
<th>No Community</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Fin</td>
</tr>
<tr>
<td></td>
<td>7.90</td>
<td>8.08</td>
</tr>
<tr>
<td></td>
<td>(2.09)</td>
<td>(2.10)</td>
</tr>
</tbody>
</table>

Cell 4 (n=20)

Notes:
Total = descriptive statistics for both cases
Fin = descriptive statistics for the financial case
Water = descriptive statistics for the water case
Diff = the difference in the mean materiality assessments for the financial and water cases (financial minus water)
Breach = risk of breaching contract treatment
No Breach = no risk of breaching contract treatment
Community = community impact treatment
No Community = no community impact treatment
# TABLE 2

ANOVA and Planned Contrasts for materiality assessments

## Panel A: ANOVA

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of engagement</td>
<td>30.902</td>
<td>1</td>
<td>30.902</td>
<td>8.446</td>
<td>0.005</td>
</tr>
<tr>
<td>Breach</td>
<td>37.128</td>
<td>1</td>
<td>37.128</td>
<td>5.238</td>
<td>0.025</td>
</tr>
<tr>
<td>Community</td>
<td>1.012</td>
<td>1</td>
<td>1.012</td>
<td>0.143</td>
<td>0.707</td>
</tr>
<tr>
<td>Breach * Community</td>
<td>4.377</td>
<td>1</td>
<td>4.377</td>
<td>0.617</td>
<td>0.434</td>
</tr>
<tr>
<td>Type of engagement * Breach</td>
<td>14.755</td>
<td>1</td>
<td>14.755</td>
<td>4.033</td>
<td>0.048</td>
</tr>
<tr>
<td>Type of engagement * Community</td>
<td>1.921</td>
<td>1</td>
<td>1.921</td>
<td>0.525</td>
<td>0.471</td>
</tr>
<tr>
<td>Type of engagement * Breach * Community</td>
<td>1.775</td>
<td>1</td>
<td>1.775</td>
<td>0.485</td>
<td>0.488</td>
</tr>
<tr>
<td>Error</td>
<td>285.399</td>
<td>78</td>
<td>3.659</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Panel B: Planned Contrasts

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Contrasts</th>
<th>t</th>
<th>P value (one-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a</td>
<td>[1,1,-1,-1]</td>
<td>2.587</td>
<td>0.006</td>
</tr>
<tr>
<td>H1b</td>
<td>[1,1,-1,-1]</td>
<td>2.008</td>
<td>0.024</td>
</tr>
<tr>
<td>H2</td>
<td>[1, -1, 1, -1]</td>
<td>0.725</td>
<td>0.236</td>
</tr>
<tr>
<td>H3</td>
<td>[-2, -2, 1,3]</td>
<td>2.217</td>
<td>0.015</td>
</tr>
</tbody>
</table>

Note:
The contrast testing H1a uses the mean materiality assessments for both cases.
The contrasts testing H1b, H2, H3 use the difference in the mean materiality assessment for the financial case and the water case (financial minus water).

The contrasts are coded across the 4 cells, where:
Cell 1 = breach, community
Cell 2 = breach, no community
Cell 3 = no breach, community
Cell 4 = no breach, no community
### Panel C: Simple Effects

<table>
<thead>
<tr>
<th>Contrasts</th>
<th>t</th>
<th>P value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple effect of breach in the <em>absence</em> of community [0,1, 0, -1]</td>
<td>1.847</td>
<td>0.07</td>
</tr>
<tr>
<td>Simple effect of breach in the <em>presence</em> of community [1,0,-1,0]</td>
<td>0.964</td>
<td>0.34</td>
</tr>
<tr>
<td>Simple effect of community in the <em>absence</em> of breach [0,0, 1, -1]</td>
<td>1.00</td>
<td>0.32</td>
</tr>
<tr>
<td>Simple effect of community in the <em>presence</em> of breach [1, -1, 0, 0]</td>
<td>0.00</td>
<td>0.98</td>
</tr>
</tbody>
</table>

**Note:**
The contrasts use the difference in the mean materiality assessment for the financial case and the water case (financial minus water)
# TABLE 3

ANOVA and Planned Contrasts for materiality assessments:

Water and financial cases separated

Panel A: ANOVA for the financial case

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breach</td>
<td>2.536</td>
<td>1</td>
<td>2.536</td>
<td>0.560</td>
<td>0.456</td>
</tr>
<tr>
<td>Community</td>
<td>0.072</td>
<td>1</td>
<td>0.072</td>
<td>0.016</td>
<td>0.900</td>
</tr>
<tr>
<td>Breach * Community</td>
<td>0.289</td>
<td>1</td>
<td>0.289</td>
<td>0.064</td>
<td>0.801</td>
</tr>
<tr>
<td>Error</td>
<td>353.056</td>
<td>78</td>
<td>4.526</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel B: ANOVA for the water case

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breach</td>
<td>49.347</td>
<td>1</td>
<td>49.347</td>
<td>7.933</td>
<td>0.006</td>
</tr>
<tr>
<td>Community</td>
<td>2.861</td>
<td>1</td>
<td>2.861</td>
<td>0.460</td>
<td>0.500</td>
</tr>
<tr>
<td>Breach * Community</td>
<td>5.863</td>
<td>1</td>
<td>5.863</td>
<td>0.942</td>
<td>0.335</td>
</tr>
<tr>
<td>Error</td>
<td>485.217</td>
<td>78</td>
<td>6.221</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel C: Planned Contrasts

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Contrasts</th>
<th>t</th>
<th>P value (one-tail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1b</td>
<td>Financial Case: [1,1,-1,-1]</td>
<td>0.748</td>
<td>0.228</td>
</tr>
<tr>
<td></td>
<td>Water Case: [1,1,-1,-1]</td>
<td>2.816</td>
<td>0.003</td>
</tr>
<tr>
<td>H2</td>
<td>Financial Case: [1, -1, 1, -1]</td>
<td>0.126</td>
<td>0.450</td>
</tr>
<tr>
<td></td>
<td>Water Case: [1, -1, 1, -1]</td>
<td>0.678</td>
<td>0.250</td>
</tr>
<tr>
<td>H3</td>
<td>Financial Case: [2, 2, -1,-3]</td>
<td>0.732</td>
<td>0.233</td>
</tr>
<tr>
<td></td>
<td>Water Case: [2, 2, -1,-3]</td>
<td>3.029</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Notes:
The contrasts are coded across the 4 cells, where:
Cell 1 = breach, community
Cell 2 = breach, no community
Cell 3 = no breach, community
Cell 4 = no breach, no community
### TABLE 3 (Continued)

ANOVA and Planned Contrasts for materiality assessments:

Water and financial cases separated

Panel D: Simple Effects for the financial case

<table>
<thead>
<tr>
<th>Contrasts</th>
<th>t</th>
<th>P value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple effect of breach in the absence of community [0,1, 0, -1]</td>
<td>0.69</td>
<td>0.50</td>
</tr>
<tr>
<td>Simple effect of breach in the presence of community [1,0, -1, 0]</td>
<td>0.36</td>
<td>0.72</td>
</tr>
<tr>
<td>Simple effect of community in the absence of breach [0,0, 1, -1]</td>
<td>0.01</td>
<td>0.93</td>
</tr>
<tr>
<td>Simple effect of community in the presence of breach [1, -1, 0, 0]</td>
<td>0.26</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Panel E: Simple Effects for the water case

<table>
<thead>
<tr>
<th>Contrasts</th>
<th>t</th>
<th>P value (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple effect of breach in the absence of community [0,1, 0, -1]</td>
<td>2.58</td>
<td>0.01</td>
</tr>
<tr>
<td>Simple effect of breach in the presence of community [1,0, -1, 0]</td>
<td>1.36</td>
<td>0.18</td>
</tr>
<tr>
<td>Simple effect of community in the absence of breach [0,0, 1, -1]</td>
<td>1.17</td>
<td>0.25</td>
</tr>
<tr>
<td>Simple effect of community in the presence of breach [1, -1, 0, 0]</td>
<td>0.02</td>
<td>0.84</td>
</tr>
</tbody>
</table>