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Exploring the foundations for effective stakeholder engagement in marine aggregates mining: Experiences in the United Kingdom and the United States

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Executive summary

CSIRO's Wealth from Oceans Flagship is currently undertaking a program of social research which aims to understand community and stakeholder perceptions of a prospective seafloor exploration and mining (SEM) industry in Australia. To date, this research has explored stakeholders' concerns and reactions to the idea of SEM, the information needed to evaluate its acceptability, and the values that influence how the SEM proposition is evaluated.

One of the indications from this research is that stakeholders and the community require certainty in the governance of SEM in Australia to ensure the industry will be responsive to the interests of the environment and stakeholders. As the industry is still emerging in Australia, a body of social research has focussed on more established industries internationally to see how conditions for maximum stakeholder certainty regarding effective governance and stakeholder engagement can be achieved. In particular, the marine aggregates (sand and gravel) industry in a number of countries has been investigated. A desktop review of regulatory frameworks governing the international marine aggregates industry in the United Kingdom, the United State and Japan has been carried out and is presented in a report entitled International regulatory regimes and stakeholder consultation for the offshore aggregate industry: Models for good practice in Australia (Johns, 2010).

This document presents the findings of empirical research intended to complement the desktop review, and explores first-hand experiences of stakeholders involved in engagement processes underpinning marine aggregates mining in two countries, the United States and the United Kingdom. Eighteen telephone interviews were conducted with stakeholders from a range of interest groups, and their accounts analysed to identify the conditions whereby stakeholder engagement process lead to a positive, or effective, experience, and those that lead to more difficult or challenging experiences.

The results from this research show that stakeholders' accounts of engagement in relation to marine aggregates mining in the UK and US, whether negative and positive, revolved around three themes – the quality of relationships, the legitimacy of information and the supportiveness of regulations. Learning from international experiences, Australia can pro-actively maximise the conditions for effective stakeholder engagement to ensure that an emerging industry remains responsive to the community and other stakeholders. Drawing on the results of this research, it has been possible to develop a framework for the conditions, or foundations, that pave the way for effective stakeholder engagement. The three clear foundations are:

> **Collaborative relationships** – based on upfront and non-coercive communication, flexibility regarding the outcomes of engagement and a commitment and pro-activity on the part of industry to invest time in developing good stakeholder relationships.
>
> **A trusted information base** – that is considered by stakeholders to be comprehensive (particularly in relation to environmental impacts), developed independently of industry, and readily accessible and well communicated.
>
> **Regulation to enhance certainty** – with transparent decision making processes (including making clear how stakeholders' input has been incorporated), high stringency so that stakeholders are confident in the mechanisms in place to regulate industry activities and ensure compliance, and processes to support engagement and the development of stakeholder relationships, for example by making clear the parties required in consultation activities.

Future research indicated by this research includes a comprehensive and holistic baseline investigation of the environmental impacts of marine aggregates mining in Australia, further analysis of the conditional factors (regulatory and otherwise) that influence industry pro-activity and commitment to stakeholder engagement, and more specific case study analysis of stakeholder engagement activities relating to actual seafloor exploration and mining proposals in Australia.

1 Introduction

Australia has a small seafloor exploration and mining (SEM) industry that is set to increase with growing demand for sand and gravels for building and beach renourishment activities. CSIRO's Wealth from Oceans Flagship is conducting a program of research focused on "Understanding the social dimensions of an expansion to the seafloor exploration and mining industry in Australia." This program has conducted a range of social research to identify stakeholders' values and concerns relating to the prospect of an expanded SEM industry in Australia. Phase 1 of this program found that the future viability of seafloor exploration and mining in Australia would be highly dependent on Australia's ability to improve the knowledge base underpinning its regulatory regime and to generate open and transparent communications between stakeholders. In particular, there was a need for a process that would identify where communication challenges exist, or are emerging, and suggest possible solutions (Littleboy & Boughen, 2007).

The second phase of the research program involves social research to inform the design and implementation of biophysical investigations into the environmental impact of SEM in Australia. This phase of social research aims to better understand stakeholder concerns and perceptions of risk regarding SEM, the information they need to evaluate whether SEM is an acceptable prospect for Australia's future, and the expectations that stakeholders have regarding a prospective SEM industry in Australia (Mason and Boughen, 2009; Paxton and Mason, 2009; Parsons *et al.*, 2010). This integrated approach is designed to ensure that the biophysical research is responsive to stakeholders' information needs and concerns, so that Australian stakeholders have the necessary information to make decisions regarding the future of SEM in Australia (Mason *et al.*, 2010).

One outcome of the research thus far is a clear indication that, in order to evaluate the acceptability of a future SEM industry in Australia, stakeholders will require greater clarity regarding how SEM activities in Australia will be regulated to ensure that interests of the environment and of stakeholders are integrated into decision making (Mason *et al.*, 2010). To begin addressing this need, a desktop review of existing regulatory frameworks and their prescribed processes for stakeholder engagement has been conducted. Given the currently limited precedent for SEM activities in Australia, this review focused on countries with more developed SEM activities and regulatory frameworks, namely the US, the UK and Japan. Since marine aggregates are the most likely offshore resource to be developed in Australia (Johns 2008), the scope of this research focused on the marine aggregates (sand and gravel) mining industry as a case study. Findings from this work, and possible applications in an Australian context, are presented in a report entitled *International regulatory regimes and stakeholder consultation for the offshore aggregate industry: Models for good practice in Australia* (Johns, 2010).

Effective processes of stakeholder engagement will be pivotal to ensuring that stakeholder interests will be integrated into any decisions made regarding the future of SEM in Australia. The term stakeholder engagement is a broad one and encompasses any process that involves stakeholders in some form of collaborative effort. It may be undertaken in many contexts, such as administrative decision-making (including the issue of licences and permits for certain regulated activities), broader planning activities or even to facilitate behaviour change (Gardner *et al.*, 2009; Harding, 1998). Engaging stakeholders and responding to their needs can result in more equitable outcomes, social risk management and better resolution of conflict by incorporating and responding to stakeholder concerns and needs throughout the decision-making process (Gardner *et al.*, 2009). However, what constitutes 'effective' engagement is complex and contextual. Many researchers distinguish between different types or 'levels' of stakeholder involvement ranging from non-participation (e.g. providing information) to extensive participation (a more deliberative relationship and process) (Aslin and Brown, 2004; Roberts, 1995; Wilcox, 1994).

This report focuses on empirical social research conducted to stakeholder engagement in the marine aggregate industries in the United Kingdom and the United States. This research aimed to collect first-hand accounts of stakeholders' actual experiences of engagement in relation to marine aggregates mining, in order to explore the factors involved in what were considered 'effective' stakeholder engagement experiences, and those involved in more difficult or challenging experiences. First-hand accounts were collected via eighteen interviews conducted with marine aggregates industry stakeholders in the US and UK. Qualitative analysis of this data was then conducted to identify factors, or themes, involved in positive and negative accounts.

2 Research approach

2.1 Research context

This research focussed on stakeholders' experiences of engagement relating to marine aggregates mining in the US and the UK. A comprehensive outline of marine aggregates mining activities in these countries, and the regulatory frameworks governing them, can be found in Johns (2010). For the purposes of providing context to the stakeholder engagement experiences explored in this document, a summary of engagement practices in the UK and US is provided below.

The United Kingdom

As a geographically small country with limited onshore resources, the UK has commercial offshore aggregates dredging/mining activities conducted in at least 70 production areas in England and Wales. Near-shore dredging for the purposes of beach nourishment (dredging sand and pumping it ashore to widen and elevate beaches and dunes to mitigate erosion) has also been used to combat storm-based coastal erosion since the 1950s (Johns, 2010).

Stakeholder engagement in marine aggregates mining takes place in the UK in a number of circumstances. For example:

- As part of formal consultation provisions conducted by the regulator (during decision-making) and the licence applicant (during environmental assessments) as part of marine aggregates mining licence applications made under the *Marine and Coastal Access Act* 2009.
- As part of industry-led engagement and marketing processes outside the formal licensing process. For example, the British Marine Aggregate Producers Association (BMAPA) conducts engagement, education and marketing activities aimed at a range of stakeholders.
- As part of the education and research activities conducted under the marine programme of the Marine Aggregate Levy Sustainability Fund (MALSF). MALSF is a fund is derived from a levy imposed on all primary aggregate production in the UK which aims to minimise demand on primary aggregates, to promote environmentally friendly extraction and transport, and to reduce the effect of local aggregate extraction.

The United States

The US has large offshore aggregate deposits along all its coasts, and offshore aggregate deposits have been dredged in state waters of the near-shore coastal zone (< 3 nautical miles) for beach nourishment purposes since the 1920s, an activity coordinated by the US Army Corps of Engineers (Johns 2010). Stakeholder engagement activities may take place in the US in a number of circumstances. For example:

- As part of a non-competitive negotiated agreement for public works projects with government agency funding (for example for beach nourishment purposes) as outlined in the *Outer Continental Shelf Lands Act*.
- As part of competitive lease sale (for example, as part of a commercial application to dredge aggregates) as outlined in the *Outer Continental Shelf Lands Act* (MMS, 2009a). However, it should be noted that as yet no competitive lease sale has been granted (Johns, 2010).

2.2 Participant recruitment and interview process

The findings contained in this report were gained through 18 interviews with a range of stakeholders in the UK (see Table 1) and US (see Table 3). Participants were identified first through the researchers' existing networks, as well as internet searches. After interviewing initial contacts, a 'snowball' method of recruitment was used, where interview participants referred the researcher to other suitable candidates. Initial contact was made via email, and over the course of the research 35 invitations to participate were sent (18 in the US, 17 in the UK).

Table 1: Summary of UK research participants

STAKEHOLDER TYPE	NUMBER
Regulator	1
Statutory advisor to government	2
Community/environmental	5
Industry	2
Consultant	1
Science/education	1

Table 2: Summary of US research participants

STAKEHOLDER TYPE	NUMBER
Science advisor/consultant	2
Government	3
Community/environmental	1

Of these interviews, 12 were conducted via telephone, while 6 participants provided written responses to a set of questions. As the investigation was exploratory in nature and focused on gaining insights, interview questions were open-ended, allowing participants optimal opportunity to discuss issues important to them. Interviews averaged 50 minutes in duration. Following a short introduction explaining the purpose of the research and ethical considerations, interviews followed the following format:

INTERVIEW PROTOCOL

Section 1. Getting consent:

- Do you consent to take part in this interview?

Section 2. Describing self:

- What is your interests/role in relation to marine aggregate mining in the [*UK/US*]?

Section 3. Experiences with stakeholder consultation as part of a marine aggregate mining:

- Can you please describe the consultation processes you have been involved in?
- Can you tell me about the sorts of issues that have come up through the consultation process?
- How do they usually go? (Optional prompts: What usually happens? What sort of outcomes are you are seeing?)
- What do you think works about these processes? What do you think doesn't work? (Optional prompt: what would be your ideal scenario for stakeholder engagement?)
- Who else can we talk to about this?

2.3 Analysis

In this research, qualitative material (in the form of interview transcripts and notes) was analysed using an interpretive approach. In this approach, analysis centres on the identification of key themes through a process of 'coding', whereby words, sentences and paragraphs are assigned labels or tags to capture their meaning (Leech and Onwuegbuzie, 2007). This process was aided using NVivo, a software application that stores data sources, facilitates coding and categorisation, and allows results to be visually represented in models.

Three stages of analytical process were undertaken:

1. **Open coding** whereby the researcher reads the interview data and freely allocates a number of descriptive codes to sections of text.
2. **Pattern coding** whereby open codes are classified into similar themes and hierarchies (Miles and Huberman, 1994).
3. **Modelling** where visual representations of key themes and codes are produced to show their relationship to one another.

The initial analytical approach to pattern coding was to categorise open codes according to whether they reflected positive accounts and experiences of stakeholder engagement, or difficulties, challenges and negative experiences.

3 RESULTS

Analysis of the data found that stakeholder experiences could be considered either positive or negative, and could be categorised into three broad themes:

- The quality of relationships between stakeholders
- The availability and legitimacy of scientific information and assessments
- The influence of regulatory processes on stakeholder engagement

3.1 The quality of relationships between stakeholders

One of the key themes identified in discussions with stakeholders about their experiences with engagement practices involved the quality of relationships between stakeholders. In positive accounts of stakeholder engagement, other stakeholders in the marine aggregates mining realm are described with goodwill, relationships are described as collaborative or at the very least improving over time, and examples are given where stakeholders have effectively worked together to achieve mutually beneficial outcomes. In negative accounts of stakeholder engagement, other stakeholders are described with antagonism, stakeholder accounts indicate a breakdown of communication and relationships appear difficult.

A number of contributing factors appear to be at play here. An NVivo model showing a summary of the major codes under the theme "Relationships" is shown in Figure 1.

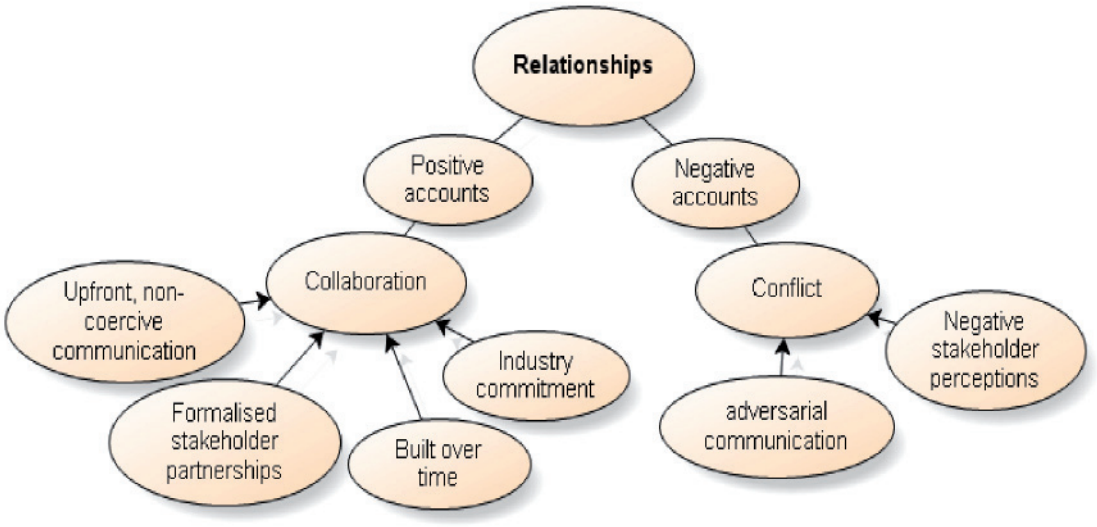

Figure 1: Major codes under 'Relationships'

3.1.1 Collaboration

In positive accounts, relationships were described as allowing collaboration between stakeholders, acknowledging different interests and positions on the issues at hand and negotiating outcomes effectively. Further analysis revealed four components involved in accounts of collaborative relationships: upfront, non-coercive communication, formalised stakeholder partnerships, the building of relationships over time and industry commitment to relationships with stakeholders.

Upfront, non-coercive communication

A key aspect of the development of collaborative relationships between stakeholders was the importance of effective communication. Communication is described in terms of allowing stakeholders to engage in open dialogue about issues, to voice their opinions freely, and to have those opinions listened to. Accounts of successful communication from stakeholders in the UK indicate that open and upfront provision of information, allowing stakeholders to state their positions on issues freely, is an effective strategy in public meetings and a good way of establishing trust.

> *If you hold your hands up and get out there, there's a certain level of respect, regardless of whether they agree with you...* Industry, UK

> *What we do now is we call them community information meetings …. We try to provide, three, four or five work stations… "Come on in and shake my hand and meet me. Let's talk this through... ", and that just seems to work out so much better.* Government, US

In addition, stakeholder meetings where industry or government bodies tried to coerce and persuade stakeholders on issues were found to be unsuccessful for establishing good relationships, becoming either adversarial or sidetracked by irrelevant issues. Less formal forums, which allowed stakeholders to communicate on an equal basis, and used open, impartial, non-coercive approaches were considered of more use:

> *We got pulled into debates and arguments that weren't solving much... We got pulled into justifying regulators' decisions, trying to fill the void…At public meetings, we now just present our information, rather than trying to win arguments.* Industry, UK

Formalised stakeholder partnerships

Another component in positive accounts of collaborative relationships in stakeholder engagement is the occurrence of formalised partnerships between stakeholders to achieve mutually beneficial outcomes.

Particularly evident in the UK (with an established marine aggregates industry), formalised partnerships included developing memorandums of understanding, joint statements, agreed protocols and funded projects through the Marine Aggregate Levy Sustainability Fund (MALSF). A partnership between English Heritage and the BMAPA to report finds of archaeological significance was one example given of these formalised partnerships (see Example 1, in the boxed text), as well as the formation of the Overfalls Group (see box 2).

Example 1: Protocol for reporting finds of archaeological significance

One example given by stakeholders of developing formal processes to guide mutually beneficial outcomes was the introduction of a Protocol for reporting finds of archaeological interest in the UK. The protection of marine archaeological interests was a key stakeholder issue in the marine aggregate mining realm in the UK (and also the US). This protocol was developed by the British Marine Aggregate Producers Association (BMAPA) and English Heritage, a public body that aims to protect England's historical environment, and applies to all BMAPA members. Implementation and communication regarding the protocol service has been supported by the Marine Aggregate Levy Sustainability Fund. The implementation of this protocol has led to a significant archaeological find of 28 flint hand-axes dating from the Palaeolithic period (approx 100,000 years ago) in gravel dredged off Greater Yarmouth, a find which won the Best Archaeological Discovery Award at the British Archaeology Awards in 2008.

Relationships built over time

Another key aspect in positive accounts is the time required to develop effective collaborations. Just as effective communication was something learned by stakeholders through trial and error, stakeholder relationships also appear to evolve over time. For example, an account from one UK stakeholder described the relationship with the marine aggregates industry as initially quite antagonistic. Over time, however, while disagreements still occurr, the relationship had become more cooperative, or at least mutually respectful, with the parties entering into joint agreements and partnerships.

> *It was all just threatening behaviour [on the part of industry], but actually, interestingly, it opened the door for dialogue, and over the next few years, that dialogue developed…Over the 10 years, we've sort of come to understand each other…* Community, UK

Other accounts relating to relationships developed over time involved gaining a greater understanding of the complexity of stakeholders' perceptions of marine aggregate mining. One account, given by a government stakeholder in the US, described how regulators had learnt that a local coastal community's acceptance of proposed dredging activities differed markedly depending on whether the dredging was for beach renourishment, or whether for commercial purposes, with the latter receiving a far more negative response.

> *They look at their oceans as sort of sacred places and they say that any...commercial activity shouldn't be happening. You know, "Don't sell our ocean,"* … Government, US

Another account, given by a UK stakeholder, illustrates how they had learnt that regional variation in perception of the industry differed between England and Wales.

> … *People in Wales, if it's anything Welsh, are very patriotic... In England it's not quite the same – unless they live right near the coast or go to the seaside every holiday….In Wales it's like "It's ours so we have to look after it and know more about it".* Science/education, UK

This finding indicates that positive stakeholder relationships may be long standing, can change and improve over time, and see empathetic understanding of the differences of perspectives between stakeholders develop. This factor appears closely associated with formal partnerships and upfront, non-coercive communication, and also, given it indicates an investment over time, the following factor, industry commitment.

Industry commitment

Industry commitment was a key aspect in stakeholders' positive accounts. Given that commercial marine aggregates mining is not yet practised in the US, this aspect related only to some UK accounts. In these accounts, the marine aggregates industry is described in terms of its commitment to effective stakeholder engagement, sustainability, and social responsibility. Particular mention was given to the British Marine Aggregate Producers Association (BMAPA), and the protection of the Overfalls region was given as an example of this commitment (see Example 2 in the boxed text).

> *[The U.K marine aggregates industry is] a pretty responsible one, and I think that largely comes down to BMAPA, the industry association who is really pushing forward on the sustainability agenda…* Community, UK

With two exceptions, UK participants describe the UK marine aggregates industry in terms of being pro-active and going beyond the regulated stakeholder consultation required as part of licence/permit applications. Examples given include information provision (for example releasing annual reports in partnership with the Crown Estate and dredging charts for the fishing industry), scoping studies prior to licence application, and broader regional environmental assessments (REAs) supported by the MALSF. In line with relationships built over time, there were indications that industry commitment and responsibility have also evolved over time.

> *On the whole, the industry is relatively mature and responsible... They've had 40 years to mumble and groan about having to be environmentally compliant. Companies are aware that it's in their best interests to be as open as possible.* Government advisor, UK.

Accounts from industry stakeholders in the UK confirm that there is a business interest in being pro-active regarding stakeholder engagement. This interest appears to stem from a combination of factors, including long decision-making

Example 2: Protecting the Overfalls

A common example given by stakeholders that demonstrates collaborative relationships is the formation of the Overfalls Groups. The 'Overfalls' refer to an area of bank 12 nautical miles offshore of Chichester Harbour in West Sussex. In 1999, when an application was made by a marine aggregate company to dredge in the area, environmental and fishing stakeholders moved to protect it, due to its unique sand and gravel ridges making it habitat to a diverse range of fish. In response, the aggregates company voluntarily amended the licence area so that the area in question would not be dredged. The dredging company, environmental and fishing stakeholders, a local university, the Crown Estate and others, formed the Overfalls Group, a collaborative stakeholder group dedicated to preserving the future of the Overfalls, funded by the MALSF.

> *This forum has allowed all stakeholders to build trust, discuss issues and needs and ultimately to resolve the conflict with regard to the application* Community, United Kingdom

However, while stakeholders appreciated the proactive and flexible stance taken by the marine aggregate company in not dredging the Overfalls, concerns were still raised regarding the ongoing protection of the Overfalls, indicating that relying only on collaborative relationships has associated risks without formal protection.

timeframes and a lack of regulatory certainty (prior to the introduction of a new regulatory framework for marine aggregates mining in the UK), high financial costs borne as part of the application process (the cost of environmental assessments and application fees for licences), and the potential for societal resistance to result in a licence being refused.

> *We wouldn't put an application in if we didn't think we could get it… in some areas we'd go out to scope and decide it was too controversial and just drop it.* Industry, UK

3.1.2 Conflict

In negative accounts of stakeholder engagement, relationships were challenging and conflicting rather than collaborative. Differences of opinion led to antagonism and ill-feeling toward other stakeholders. Further analysis revealed two components that were associated with conflict: adversarial communication and negative stakeholder perceptions.

Adversarial communication

Negative accounts of stakeholder engagement were described in terms of adversarial communication, where stakeholders are in opposition with each other. An example given by US stakeholders was the public hearing, run by government entities to consult on a particular decision. Rather than being dialogic, stakeholders come together to present a case before a decision-maker regarding an application to dredge, a process that can become highly politicised.

In negative accounts there are indications that stakeholder groups are inflexible in regards to the outcomes of the proposal, so rather than negotiating mutually beneficial outcomes, resolution of issues is determined by the strength of political influence.

> *… sometimes these decisions are already pretty heavily weighted towards what the outcome that the State would like to see, but typically, again, it goes back to the number of people [who oppose it].* Community, US

> *The people who go to [public meetings] are the people who oppose it. … Those meetings are quite vocal. It's good for people to be able to say what they feel, but sometimes some of the meetings are a bit 'us and them' in terms of the industry versus the public. It can be a bit counter-productive.* Science/education, UK

Adversarial communication was seen as resulting in outcomes that do not benefit either party. As a scientific stakeholder in the US highlighted, environmental backlash against dredging for the purposes of mitigating beach erosion, has forced authorities to implement beach erosion solutions (such as seawalls and groynes) that may be, in fact, less friendly to the coastal environment. Accounts of positive stakeholder engagement suggest that these outcomes may have been avoided using a more dialogic approach to communication.

> … *The environmental groups are shooting themselves in the foot if they stop beach renourishment, which is the most benign method of protecting the shore….We try to explain this to them, but they just don't want to listen…* Science/consultant, US

Negative stakeholder perceptions

In negative accounts, adverse perceptions of other stakeholders are expressed, including a level of cynicism regarding their motives. One US scientific stakeholder expressed a perception of community and environmental advocates as engaging in underhand tactics during public hearings. Some community stakeholders in the UK also expressed cynicism regarding the motives of industry and science representatives. The opinion that some community and environmental stakeholders are 'extremists' and 'unamenable to engagement practices' was expressed, at times, by industry and scientific stakeholders.

> The opponents have such a chip on their shoulder and are so belligerent and they are so convinced that they are right, that there's no other possibility. Science/consultant, US

> You're dealing solely with extremists in most cases, not reasonable people. It becomes very, very difficult. Science/consultant, UK

On the other hand, some community and environmental stakeholders viewed industry decision-makers as dismissing reasonable objections and input.

> *We've made it apparent that there is another side, but they choose to ignore it. Nothing ever changes. I can't blame them – they're only in it for the profit… The whole thing is advertising.* Community, UK

3.2 The legitimacy of information

The second key theme identified was the legitimacy of information. In positive accounts of stakeholder engagement (including participants' suggestions for 'ideal' stakeholder engagement) a level of trust is expressed by stakeholders regarding the information and knowledge that forms part of the engagement process and decision-making. Trust in information appeared to be influenced by the perceived quality of the knowledge base underpinning engagement and decision-making as well as the ready accessibility of the information. In negative accounts, distrust in the information is expressed. In particular, scientific evidence regarding environmental impacts is disputed, and considered incomplete and not independent. A model showing a summary of the major codes under this theme is shown in Figure 2.

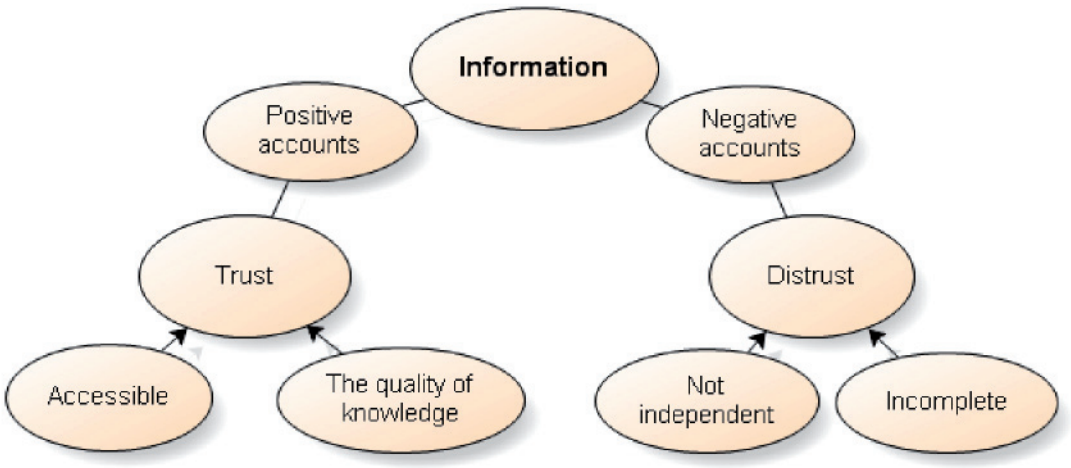

Figure 2: Model showing major codes under the theme 'Information'

3.2.1 Trust

When information was mentioned in positive accounts, it was described either in terms of its quality (particularly how this quality has improved over time) and in terms of its accessibility. These two categories are described in more detail below. In addition, two key illustrations of how the information base had improved were given by UK stakeholders.

The quality of knowledge

The 'quality' of knowledge refers to the comprehensiveness and adequacy of the information provided to stakeholders. Of particular focus for stakeholders was the adequacy of scientific information and assessments of the marine environment and the impacts of marine aggregates mining. Stakeholders emphasised the importance of continued improvement of the scientific knowledge base, and also provided accounts of improvements in scientific assessments over time. One such improvement mentioned by industry stakeholders was that evaluation of impacts has been expanded to include cumulative impacts of marine dredging. Two key illustrations of how the information base had improved were given by UK stakeholders. The first was the introduction of Regional Environmental Assessments (REAs), and the other is the role of the MALSF in providing support for research and education on effects of marine aggregate mining. These are described in Examples 3 and 4.

Example 3: Regional Environmental Assessments (REAs)

Industry-led REAs are a voluntary initiative whereby the cumulative and in-combination effects of multiple dredging licences are considered at a regional scale (BMAPA, 2009). Support for REAs is provided by MALSF, and industry stakeholders view REAs as allowing the industry to get a broad idea of geological and biological issues, before going to the expense of applying for licences.

> *The regional assessment approach is like laying the wallpaper before putting up the pictures.*
> Industry, United Kingdom

At March 2010, REAs had been completed, or were in the process of being completed, in the Eastern English Channel, South Coast, Thames Estuary, East Coast and Humber regions of the United Kingdom. A program of targeted stakeholder engagement forms part of the assessment, and input is sought from scientific organisations and statutory bodies.

Accessible information

The accessibility of information also seemed to be a component of stakeholders' trust in information. Positive accounts from stakeholders in both the US and the UK made reference to how making information available is important to building trust. An example of this given by stakeholders in the UK was making information relating to consultation and other documents relating to the licence decision-making process available on the internet.

In addition, stakeholders from both countries highlighted the role of freely available information in facilitating good relationships between stakeholders. For example, in the US stakeholders referred to the availability of publicly funded research on government websites and how this has the potential to reduce levels of conflict between stakeholders by providing the foundations for a mutual understanding. Accounts from industry stakeholders in the UK indicate that sharing information has considerable value in terms of building relationships. One stakeholder spoke about the need to 'demystify' the seafloor and share scientific information freely.

A number of examples were given by UK stakeholders as to the ways in which the marine aggregates industry works with other stakeholders to produce information and make it available. These included the collaborative production of annual reports by BMAPA and the Crown Estate, sustainability reports and reviews of environmental impacts and value of the resource, and the production of charts showing industry activities for the fishing industry to avoid damage to fishing equipment by aggregates dredgers.

Example 4: The Marine Aggregates Sustainability Levy Fund (MALSF)

Started in 2002, this fund is derived from a levy imposed on all primary aggregate production in the U.K and aims to minimise demand on primary aggregates, to promote environmentally friendly extraction and transport, and to reduce the effect of local aggregate extraction. The MASLF is used to develop scientific knowledge regarding the marine environment and marine aggregate mining as well as methodologies for conducting scientific and ecological assessments, as well as conduct educational activities regarding the marine environment and marine aggregates. Two bodies coordinate MASLF - the Centre for Environment, Fisheries and Aquaculture Science, and English Heritage – and it is overseen by a steering group (MASLF 2007).

A number of different types of stakeholders mentioned the MASLF when discussing the importance of developing knowledge, and communicating that knowledge, to good stakeholder engagement.

> *Ten years on, those people who didn't know about it, generally have access to a much better body of information than we did before, and in that respect, the consultation process has been better.* Community/environment, United Kingdom

Industry stakeholders described MALSF as a cost effective means of conducting research in seafloor mining, scientific stakeholders highlighted that communicating MASLF research increases trust by demonstrating the rigour behind marine aggregate mining:

> *A lot of people believe that decisions are made by people who sat in offices with no connection to the environment themselves... [MALSF has] done a lot of work to show that some of the projects … have involved more than three years of getting basic information about the seabed before any activity is even considered to be allowed to take place.* Science and education, United Kingdom

3.2.2 Distrust

Negative accounts of stakeholder engagement also indicate that the quality of information is important for effective stakeholder engagement. When mentioned in negative accounts of stakeholder engagement, information was described either in terms of its incompleteness or its lack of independence. These categories are described in more detail below. An common instance of stakeholder distrust in both countries is described in Example 5.

Incomplete knowledge

The idea that our understanding and knowledge regarding marine aggregates mining is inadequate and incomplete was a key aspect in interviewees' negative accounts of stakeholder engagement in both the US and the UK. This idea was particularly connected with the perceived environmental impact of marine aggregates mining on the seafloor and on the coastline, which is a key concern requiring resolution through stakeholder engagement processes in both countries.

One issue raised in interviews with both UK and US stakeholders was the lack of adequate baseline knowledge about the seafloor in dredging regions prior to the advent of dredging activities, resulting in an inability to assess the impacts of dredging adequately. Another criticism given in the UK was that monitoring and evaluation processes that consider the cumulative impacts of dredging has only been recently introduced, making it difficult to understand the long-term impacts.

> *They do find it difficult to look at their activities in the context of not only of the … aggregate dredging activity but also say, wind farm development elements and commercial fishing, and so on. It is a difficult area, but I don't think they always address it as well as they could do.* Community/environment, UK

Others expressed mistrust in the environmental impact assessments conducted as part of licence applications. One interviewee stated that the language used in the environmental assessments reflected a level of certainty that was difficult to believe given the general lack of scientific certainty regarding environmental impacts, while others highlighted the poor communication of scientific information.

> *My real bug bear over the years has been that the language used didn't adequately convey, or didn't even try to convey, the level of certainty in the assessment. They would tend to make a very assertive judgement that such-and-such an impact was not significant or was of no import whatsoever, without actually expressing any uncertainty.* Community/environment, UK

> *[In the meetings scientific experts] resorted to scientific technobabble... This just reinforces the view that they're hiding something.* Government advisor, UK

The idea that the scientific knowledge is inadequate and incomplete plays a key role in negative accounts of stakeholder engagement. For some stakeholders, whose key concerns are protecting the environment and maintaining affected communities, this perceived incompleteness manifests as uncertainty and distrust in proponents of marine aggregates mining and in the engagement process. In the accounts of government, scientific and industry stakeholders, this has lead to difficulty engaging in open dialogue to negotiate outcomes.

> *You end up with a tremendous amount of misinformation and disinformation… and then you have all kinds of problems to overcome. People make up their mind: "This is bad. This is going to ruin the environment. This will be a disaster."* Science/Consultant, US

Lack of independence

Another factor that leads to distrust and associated difficulties in stakeholder engagement is a perception that scientific information and assessments are not conducted independently. This issue was particularly highlighted by community stakeholders in the UK, who argued that the process of engaging consultants to conduct environmental impact assessments for licence applications results in a 'pecuniary interest' which jeopardises non-biased assessment. This relationship has led to a degree of mistrust in the validity of the environmental assessments themselves.

> *The environmental consultancy employed by the applicant, whilst working to professional procedures, is often heavily dependent on the licence applicant (marine aggregates company) for its own livelihood, i.e. it is not difficult to see that if the environmental consultancy produces an EIA which is unfavourable to the applicant, then that consultancy obtains no further EIA contracts and is forced out of business.* Community/environmental, UK

Example 5: Controversy over coastal erosion

Distrust over the quality of information was evident in accounts from community, scientific, government and industry stakeholders in both the US and UK regarding the possible effect marine dredging has on the coastal environment. A key contention is whether marine dredging leads to change wave patterns and coastal erosion. Scientific stakeholders maintain that the current state of knowledge is adequate to rule out any connection between beach erosion and marine dredging (MALSF, for example, does not fund research into the issue). However community stakeholders maintain that there is scientific evidence that marine dredging has a negative impact on the coastal environment, and that current scientific assessments are inadequate. Frustration and conflict from both sides of the argument are evident from stakeholder accounts, with one UK stakeholder referring to the conflict as a "war" and expressing distrust regarding government motives, and other stakeholders expressing frustration regarding communication issues.

> *They (the government) are being deliberately myopic. They only have ears for the dredging companies, and thus they deny that there is evidence of erosion.* Community, United Kingdom

> *Their concerns are genuine, but it gets tiring when you know there's no link [between dredging and erosion]. How many times can you present the same information?* Government, United Kingdom

Industry stakeholders described MALSF as a cost effective means of conducting research in seafloor mining, scientific stakeholders highlighted that communicating MASLF research increases trust by demonstrating the rigour behind marine aggregate mining:

> *A lot of people believe that decisions are made by people who sat in offices with no connection to the environment themselves... [MALSF has] done a lot of work to show that some of the projects … have involved more than three years of getting basic information about the seabed before any activity is even considered to be allowed to take place. Science and education,* United Kingdom

3.3 The influence of regulatory processes on stakeholder engagement

The final theme identified involved the influence of regulatory processes on experiences of stakeholder engagement. The nature of this influence appeared to be contingent on the level of certainty provided to stakeholders through the regulatory process. A summary of the major codes under the theme "Regulations" is shown in Figure 3.

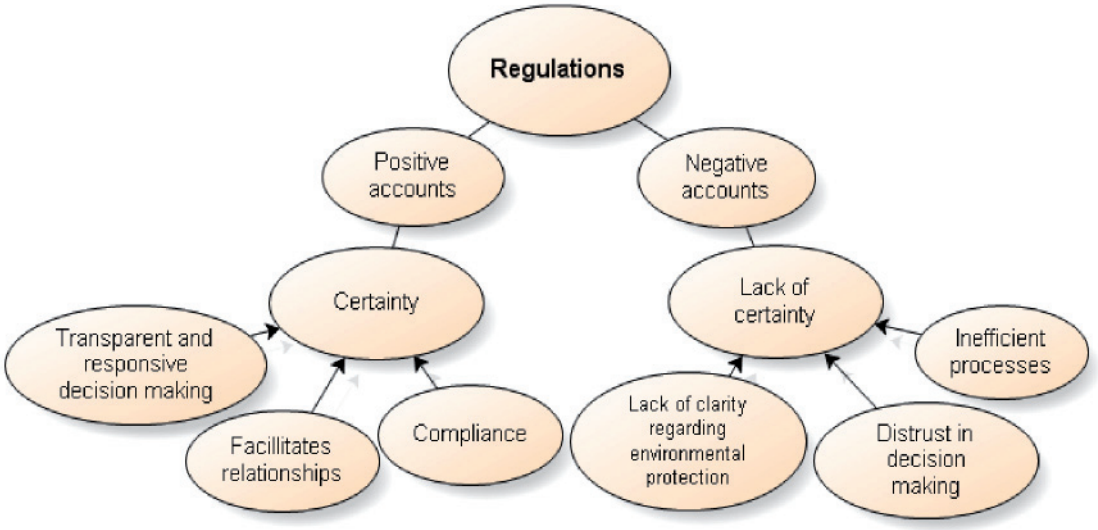

Figure 3: Model showing major codes under the theme "Regulations"

3.3.1 Certainty

In positive accounts of stakeholder engagement, regulations were described in terms of allowing for greater certainty regarding decision-making and stakeholder engagement. The need to maximise regulatory certainty was also central in participants' suggestions for improvement to the stakeholder engagement processes. Data analysis found three broad categories in positive accounts of regulatory certainty and its influence on stakeholder engagement. These are transparent and responsive decision making, regulations that facilitate good relationships, and certainty arising from the expectation that compliance with regulations will be achieved. There were also two suggestions for improvement – enhancing independence in assessments and audits, and increasing clarity regarding environmental protection.

Transparent and responsive decision making

A key aspect of positive accounts of stakeholder engagement was transparent and responsive decision making in regulatory processes. These accounts mainly stemmed from industry and government stakeholders in the UK where a number of accounts related to the recently introduced *Marine and Coastal Access Act* 2009, and the formation of a non-departmental body, the Marine Management Organisation (MMO). The MMO incorporates responsibilities of the previous Marine and Fisheries Agency and marine-related responsibilities from other government departments. As outlined in Johns (2010), consultation regarding marine planning and development decisions is a responsibility of the MMO and processes for consultation are made clear in the legislation and the underlying *Marine Policy Statement*. These responsibilities include publishing a Statement of Public Participation for each plan, providing an outline of consultation processes, the publishing and coordination of public responses and any necessary amendments to the plan, implementing an adaptive approach to consultation, and the creation and involvement of community steering groups or coastal partnerships to support the planning body in developing plans.

Many UK stakeholders expressed optimism that the new regulatory framework would ensure that decision-making would incorporate the views of all stakeholders and be more transparent. The publishing of licence and permissions online was an example given by participants of the increased transparency of regulatory decision making over the last few years, as was the linking of conditions on licences with stakeholder concerns to demonstrate how regulators are responding to those concerns. Another improvement to the UK regulatory framework mentioned by stakeholders was the provision of clearer regulatory timeframes for decision making. One industry stakeholder

stated that previous arrangements, with a greater role for industry in public consultation, allowed decision makers and government advisory groups to 'drag their feet' regarding licensing decisions. One participant estimated that, because of these provisions, previous timeframes of 10 to 20 years to award a licence would be reduced to 5 to 10 years.

> *In the old system we didn't know when decisions were likely to be made. With our business you need certainty.* Industry, UK

Facilitating relationships

Another aspect where the regulatory framework provides certainty involved the role that regulators and regulations can play in building relationships between stakeholders. Again, this aspect was observed primarily in UK stakeholders describing the improvements that have been introduced in new regulatory processes. These improvements include providing better lists of stakeholders with which to consult, regulators assisting engagement with more 'difficult' stakeholders, better regulatory arbitration, and government support for affected parties.

Stringent compliance

Another factor in stakeholders' positive accounts of engagement practices was a confidence that stringent mechanisms were in place to ensure compliance with the conditions imposed on licence conditions. Accounts from stakeholders in both the US and the UK demonstrated confidence in the monitoring and surveillance processes conducted in aggregates dredging, describing them as more stringent than in other industries.

> *[They] have a black box monitoring system on board each dredging vessel, and if they go outside of their license [area] it generates an automatic letter from the Crown State … three strikes and you're off... Fisheries don't have [that] …* Community/environmental, UK

3.3.2 Uncertainty

Data analysis found three broad categories in negative accounts of regulatory certainty and its influence on stakeholder engagement. These were insufficient clarity regarding environmental protection, distrust in the decision making process and inefficient processes. These are discussed below.

Insufficient clarity regarding environmental protection

Having a lack of clarity regarding how the regulatory framework would achieve tangible environmental protection was another factor observed in the analysis, with stakeholders saying that if they had this clarity they would be able to have a more considered response when being consulted with. A clear example of this given by stakeholders in the United Kingdom was the importance of introducing a network of Marine Protected Areas. As one UK stakeholder argued, without a dedicated network of Marine Protected Areas underpinning engagement, environmental stakeholders need to err on the side of caution when negotiating environmental protection. Accounts also suggest a level of support from industry stakeholders for the development of MPAs, as this increases certainty regarding viable areas for dredging.

> *If we knew that we had an adequate and well-managed network of MPAs …then it would be easier for us to [negotiate], but [now] how do we know that this piece [of habitat] isn't the most important piece… the straw that breaks the camel's back?* Environmental/community, UK

Distrust in decision-making processes

In negative accounts, distrust is expressed in the decision-making processes underlying marine aggregate mining. This distrust appears to come from a perceived lack of independence in these processes. In the UK, stakeholders called for great independence of the environmental assessment process and regulatory decision making. There was criticism of the current environmental assessment process, where industry contracts consultants to conduct assessments to underpin licence applications.

> *The system that operates at present does not provide independence…In theory the licensing authority is the independent party and independent of this process. However the licensing authority has a policy that says that marine aggregate extraction is to be encouraged, and central government receives the revenue arising from the licence…* Community/environment, UK

In addition, negative accounts from both the UK and US, a general distrust of government was also evident.

> *The problem is, in the US, now, everything is becoming so corrupt, including the federal government. People just don't believe more or less anything anymore because there are so many lies coming from the government, which sounds hard to believe, but that's the way it is.* Science advisor/Consultant, US

Inefficient processes

In negative accounts, inefficient processes were also mentioned. Bureaucratic inefficiencies that slow the consultation process, and the large environmental impact documents that stakeholders are required to provide comment on, were examples given of this issue.

> *Regulators and their applicants can be extremely slow in responding to applications and responses received are often poorly considered and unhelpful.* Community/environment, UK

> *Some of these consultations have been 1200-page tomes that make very useful door stops. You just wonder whether they are doing that just to make it look completely impenetrable, because if they do, it works. A lot of people get no further than that.* Community/environment, UK

4 DISCUSSION

4.1 The foundations for effective stakeholder engagement for SEM in Australia

Australia is in a unique position to incorporate effective stakeholder engagement principles to all stages of the development of an SEM industry in Australia – including initial scoping of a potential industry's environmental viability and social acceptability. In addition, Australia is set to go through a period of growth and expansion of its ports and harbours and the lessons learnt here have relevance to that activity as well. The findings from this research provide a basis for developing an effective approach for this engagement. Using marine aggregates mining in the UK and the US to provide experiential insights, our data highlight the factors involved with both positive and negative experiences of stakeholder engagement. The overarching result observed in this research is that stakeholders' accounts, whether negative and positive, revolve around three themes – collaborative relationships, trusted information and regulation to enhance certainty. A conceptual model of the elements that appear to enhance stakeholder engagement is provided below.

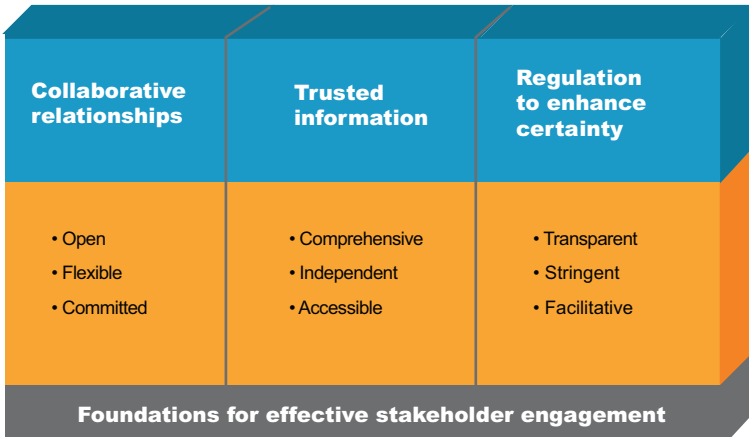

Figure 4. Three foundations for effective stakeholder engagement in marine aggregates mining

Collaborative relationships

The importance of the quality of relationships to the perceived effectiveness of stakeholder engagement processes is a key outcome of the research, with positive experiences reflecting collaborative relationships, and negative accounts reflecting conflict. Upfront and non-coercive communication, with an emphasis on information sharing and dialogue, was favoured over coercion or argument, and learnt over time. This is consistent with stakeholder engagement

literature that advocates a dialogic communication approach, involving a two-way discussion of contested concepts with a view to achieving shared understanding (Putnam *et al.*, 1996).

Commitment on the part of all stakeholders was another key element in effective relationships. In the UK, this commitment was particularly evident in accounts of the role the marine aggregates industry had played in developing relationships with stakeholders. This industry, headed by the British Marine Aggregate Producers Association, appeared from many accounts to be committed and proactive in developing relationships with stakeholders, demonstrating flexibility regarding outcomes such as that exemplified by the Overfalls Group, and entering into formalised partnerships with a range of stakeholders to achieve mutually agreeable solutions. As with communication style, commitment and pro-activity regarding collaborative relationships in the UK industry is relatively new, and the industry had 'evolved' to become more responsive to its stakeholders. Some drivers of this evolution appear to be the high cost of environmental impact assessments and licence applications borne by industry, combined with the risk of lost societal acceptance affecting the viability of an application, and, to a degree, a slowness on the part of regulators to respond to the growth of the marine aggregates industry (prior to the introduction of a new regulatory framework in the UK).

Based on the learnings in the UK and the US, Australian stakeholders have an advantage, being able to develop collaborative relationships early in the development of a potential SEM industry. However, these findings indicate that attention must be given to ensuring that there are necessary conditions for these collaborative relationships to develop early. Without 'trial-and-error' learning, there may be a need for government decision makers to introduce measures to promote commitment to collaborative relationships, and the incorporation of stakeholder interests into decision-making throughout the life of a project. Current CSIRO research into the mining industry's 'social licence to operate' can inform these measures (Moffat *et al.*, 2010; Parsons *et al.*, 2010).

Trusted information

The results of this research also demonstrate the importance of an accessible and trusted information base to underpin stakeholder engagement. Positive accounts of stakeholder engagement illustrate the importance of readily available knowledge and educative material regarding the marine environment, the impact of marine aggregates mining activities, and the processes underlying decisions made regarding these activities. These factors appear to promote feelings of trust and confidence that decisions are based on a sound knowledge base, which facilitates more positive experiences of stakeholder engagement.

The importance of trust as a conditional factor for effective engagement, relationships and communication, is found in literature exploring the mining industry (e.g., Gunningham and Sinclair, 2009) and in other contexts (e.g., Tam *et al.*, 2009). However, if the information base is considered by stakeholders as incomplete and biased, this erodes trust and affects the quality of the stakeholder engagement experience. In negative accounts of stakeholder engagement, there is considerable dispute regarding the information shared during the engagement process. These disputes often centre on the perceived lack of knowledge regarding the environmental impacts of marine aggregates dredging, including concerns over the adequacy of baseline data and ongoing monitoring of impacts. Frustration expressed by a range of stakeholders in both the UK and the US over an inability to reach consensus regarding the link between marine dredging and beach erosion is one such illustration of differing claims over the adequacy of scientific knowledge. In addition, suspicion based on a perceived lack of independence of scientific investigations and environmental impact assessments was also central in negative accounts of stakeholder engagement.

While there has been considerable retrospective effort in both the UK and the US to address the issues of trust in regard to the knowledge base regarding the marine environment, and the environmental impacts of marine aggregates mining (for example, through the MALSF), distrust in scientific knowledge remains a key issue in accounts of stakeholder engagement processes. Again, Australia is in an advantageous position to maximise its baseline understanding of the environmental impacts of SEM, and to ensure that these environmental impacts are given consideration by stakeholders prior to industry development.

Previous social research conducted by CSIRO's Wealth from Oceans flagship indicates a concern among stakeholders that not enough is known regarding the marine environment to evaluate the viability of an SEM industry in Australia (Mason *et al.*, 2009, Paxton and Mason, 2009). This, coupled with an expectation that any prospective SEM activity should ensure that environmental impacts are minimised (Parsons *et al.*, 2010), indicate that a trusted information base – one that is accessible, comprehensive and developed independently of industry decision-makers – will be similarly pivotal to effective stakeholder engagement in this country.

Regulation to enhance certainty

The final foundation for effective stakeholder engagement indicated in this research is a supportive regulatory framework. When positive, accounts of stakeholder engagement highlight regulations that provide certainty – through a greater transparency regarding decision-making, clear timeframes and facilitating relationships between stakeholders, and stringent mechanisms to maximise compliance with legislation. Negative accounts, in contrast, are characterised by a perceived insufficiency of legislation to protect the environment, a distrust of the motives of the regulator, and inefficient processes leading to consultation fatigue.

These findings are consistent with Johns' (2010) comprehensive overview of the existing regulatory frameworks governing marine aggregates mining in the U.K, the U.S and Japan. From this review a number of 'models of good practice' were identified, two of which related to stakeholder engagement. The first was stakeholder consultation associated with the environmental impact assessment (EIA) process, to allow stakeholders to have input into more specific regulatory decisions. The current research suggests some specific ways in which regulatory processes can be made more responsive. These include making stakeholders' input into the decision-making process on licensing clear and transparent, the parties required in consultation activities, and ensuring that stakeholders are aware of the stringent compliance mechanisms in place to ensure that licence conditions are adhered to. A key point of discussion in UK interviews was the recent introduction of new UK legislation which includes more holistic provisions for engagement and consultation regarding marine policy and the development of marine plans. However, stakeholders still called for greater independence (particularly in relation to the development of environmental impact assessments) and greater certainty in regard to environmental protection through the development of Marine Protected Areas.

The second 'model for good practice' common to the three countries reviewed by Johns (2010), were provisions for more general public stakeholder engagement beyond the regulated consultation processes. The value of such models is also supported by the findings of this research. Of particular note is that the pro-active stance taken by industry to develop sound relationships with stakeholders has both enhanced the experience of engagement and societal acceptance prior to licence application. Also, the provision of scientific information and environmental education to enhance engagement by programs such as the MALSF is another example of engagement beyond what is required under the regulatory process. Effective engagement in Australia will be fostered by exploring possibilities for industry and independent third party engagement with stakeholders in tandem with a supportive regulatory framework. However, in the older industries such as the UK, these aspects have evolved over time – in the Australian context it will be necessary to explore how these aspects can be enhanced at the inception of a marine aggregate mining industry.

4.2 Directions for future research

This research has explored stakeholder experiences of marine aggregates mining in the UK and the US, with the aim of identifying some key principles that can be applied in Australia. It has identified that the quality of relationships, the legitimacy of information and the influence of regulatory processes form a foundation for stakeholder engagement experiences. Incomplete and distrusted information, adversarial relationships and regulatory frameworks that lead to a sense of uncertainty in stakeholders provide an inadequate foundation for positive engagement experiences. The outcomes of this research may also have applications for other growing marine industries that impact on the seafloor.

To further understand and enable effective stakeholder engagement in relation to Australia's potential SEM industry, the following research is recommended:

- A comprehensive and holistic investigation of the environmental impacts of marine aggregates mining in Australia to provide a thorough baseline of information on which to base stakeholder engagement and communication activities.
- An analysis of the conditional factors (regulatory and otherwise) that influence industry pro-activity and commitment to stakeholder engagement, and how to enhance these conditions in and outside of regulatory frameworks.
- Case studies of stakeholder engagement relating to actual seafloor exploration and mining in Australia, focusing on sites where SEM is proposed or potentially likely to occur, to provide specific insights on shaping effective engagement.

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