

## **SUSTAINABILITY ASSESSMENT OF RESOURCE DEVELOPMENT PROJECTS IN WESTERN AUSTRALIA: HOW SUSTAINABLE IS THE PROCESS?**

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### **ABSTRACT**

Several recent major Western Australian resource development projects have been subjected to external sustainability assessment (SA) by government agencies. Additionally a number of large (multi-national) mining and resource development companies have been applying SA procedures internally to guide their corporate decision-making process for new projects. In the absence of formal SA requirements or procedures, an ad hoc approach has been adopted in each case. This paper briefly reviews the origin and evolution of SA in Western Australia including its relationship with other assessment processes such as environmental impact assessment. More particularly, it examines the SA procedures that have been used to date and classifies them according to a model which examines:

- the decision question being asked;
- the approach to sustainability being adopted; and
- the nature of the development proposal itself.

In doing so, the level of integration of economic, social and environmental elements that can be achieved is revealed. The relative strengths and weaknesses of the various SA procedures are examined including the prospects for future practice in Western Australia. Overall the paper addresses the question: How sustainable is sustainability assessment?

**Keywords:** sustainability assessment, resource development, integration, Western Australia, environmental impact assessment, governance

### **INTRODUCTION**

Sustainability assessment (SA) can be considered the third generation in the evolution of development assessment tools following environmental impact assessment (EIA) and strategic environmental assessment (SEA). It is an emerging field worldwide that currently remains relatively under-developed compared to experience and practice with EIA and SEA. A principal reason for this concerns the extra dimensions to integrate into decision-making processes that SA demands. Apart from needing to factor in social and economic dimensions in addition to the traditional environment emphasis of EIA, the sustainability agenda encompasses a much broader range of stakeholders and government agencies as well as more a complicated time dimension when the rights of future generations are also factored in.

The purpose of this paper is to briefly document the emergence of SA practice in Western Australia with particular emphasis on government approvals of major resource development projects. The role of proponent based, 'internal' SA processes is acknowledged as an important additional advancement in practice to design and operate more sustainable projects. However, the main emphasis of the paper is on a framework for thinking about externally applied SA in terms of the decision question being asked and the conception of sustainability being used. The nature of the development proposal itself also has bearing on what a SA can achieve in practice. This framework is illustrated using the three government initiated SAs undertaken on resource development proposals in Western Australia over the last 5 years as case studies. Understanding the potential for integration of environmental, social and economic (ESE) elements is a key outcome of applying this framework to a given proposal and its

context. Thus this paper aligns with Principle 1 of the Enduring Values identified for the Minerals Council of Australia Sustainable Development Conference, in particular compliance with Western Australian laws and regulations and collaboration between government, industry and community stakeholders to enable procedures to be implemented in the absence of a formal statutory requirement for SA. The paper concludes with some thoughts about possible future directions for SA practice in WA.

### **SUSTAINABILITY ASSESSMENT IN WESTERN AUSTRALIA**

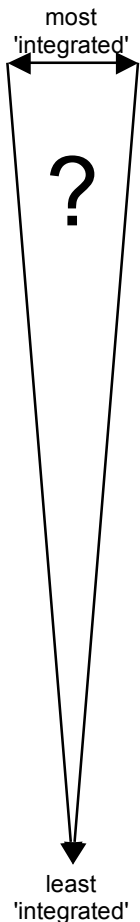
Support for the implementation of a SA mechanism to be used in the assessment of new development proposals in Western Australia arose on two fronts in 2002. The Keating Review of the project development approvals system operating in the state included a recommendation (no. 53) for the government to require a proponent of major projects to 'develop a sustainability statement that addresses the economic, social and environmental impacts of the project during the construction and operations phases and following site rehabilitation, in a manner that enables the government to assess the overall cost-benefit to the State from a sustainability perspective' (Independent Review Committee 2002, p120)

At around about the same time, the Government of Western Australia was developing a *State Sustainability Strategy* with a draft document produced in 2002 that was updated the following year after a public review process. The Strategy defined sustainability as: 'meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity' (Government of Western Australia 2003, p4). Thus the vision is to achieve a 'win/win/win' outcome in the three ESE pillars (or 'triple bottom line' categories). A chapter on Sustainability and Governance outlined a vision for a SA process that builds upon existing assessment procedures (e.g. such as the well developed EIA process that operates in Western Australia under the *Environmental Protection Act 1986*) and 'that provides integrated advice to achieve net benefit outcomes' (Government of Western Australia 2003, p38). By way of action, it was suggested that the government would undertake SA on complex or strategic projects selected by Cabinet. Thus an ad hoc approach to SA would occur based on a 'learning by doing' approach conducted on a case by case basis. No formal legal mechanism for undertaking SA has been put in place in Western Australia; the approaches that have been adopted are outlined briefly in relation to the three case studies further on.

### **FRAMEWORK FOR UNDERSTANDING SUSTAINABILITY ASSESSMENT**

The integration of ESE elements in SA can occur in different ways; the spectrum of possibilities has been defined by Morrison-Saunders and Therivel (2006) as shown in Table 1, starting with the most integrated and more sustainable at the top, and moving down to the least integrated/sustainable. This is a theoretical model as in practice, assessments are unlikely to fall discretely into these categories, but rather one assessment may include components of several of these approaches. A similar approach has been put forward by Pope and Grace (2006).

**Table 1 - Spectrum of approaches for 'integrating' ESE considerations in sustainability assessments** (Source: Morrison-Saunders and Therivel 2006)

	Assessment approach	Characteristics	Comments
 <p>most 'integrated'</p> <p>?</p> <p>least 'integrated'</p>	full integration	Sustainability considered as integrated concept, not three separate pillars.	Assessment is guided by clear integrated principles for sustainability and decision-making trade-off rules. Emphasis on justifying that sustainability has been achieved (or at least appropriate process followed to best practicable extent).
	maximise objectives	Outcome should benefit each factor within each ESE pillar.	Positive outcomes with respect to each individual factor are sought. Trade-offs between ESE factors can only be made in accordance with trade-off rules that protect bottom lines.
	win/win/win	In addition to minimising impacts, also seeks to achieve positive outcomes in each ESE pillar overall.	More actively seeks the positive in all pillars (e.g. ensure environment is not traded off). May promote mitigation beyond scope of normal IA practice (eg offsets).
	net gains	Outcome should be net gains in ESE overall.	Does not demand gains in all pillars simultaneously (eg could have socio-economic gain at environmental cost).
	threshold test	Impacts should be tested against a fixed bottom line of criteria for each factor.	Implies pre-determined bottom lines that must not be breached. May still involve separate treatment of ESE pillars.
	minimise impacts + extra considerations	Also considers other sustainability issues (eg inter- and intra-generational equity, precautionary principle).	Considers other impacts beyond the scope of traditional EIA/SEA practice.
	minimise impacts	Expansion of traditional EIA/SEA to include economic and social impacts. Aim is to identify and mitigate adverse impacts.	Tries to avoid adverse impacts. Offsets may be used to counter adverse impacts. Trade-offs between ESE pillars may occur.

At the 'bottom end' of the spectrum in Table 1 lies a traditional project-based EIA driven approach to SA that simply adds economic and social impact prediction and mitigation to the EIA process. A slightly more sophisticated approach might incorporate aspects of sustainability such as the precautionary principle and the needs of future generations. These processes are limited in terms of being able to deliver truly sustainable outcomes, principally because of their focus on minimising negative effects (Pope et al 2004).

The threshold test identifies bottom lines that should not be crossed in the name of sustainability. This approach may still be predominately about minimising the negative as opposed to seeking positive outcomes. Morrison-Saunders and Therivel (2006) advocate that threshold tests should also be incorporated into each of the 'higher' level sustainability assessment approaches in Table 1.

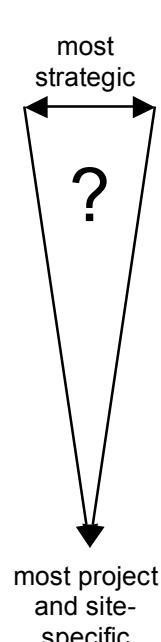
The next three SA approaches in Table 1 attempt to achieve positive outcomes at various levels. The concept of 'net gains' seeks to ensure the outcome of a sustainability assessment should be net gains in ESE overall when all pillars (i.e. where each pillar is taken as the aggregation of individual factors within it) are accounted for. Tradeoffs between pillars might still occur so long as there is a perceived overall benefit. The win/win/win approach is a more sophisticated version which seeks gains in each of the sustainability pillars and thus does not allow one or more of these to be traded off against others. Finally, the notion of maximising objectives attempts to proactively meet societal goals with respect to each of the ESE factors within each of the pillars (Morrison-Saunders and Therivel 2006).

All of the approaches to SA discussed so far encourage separate consideration of ESE elements. A more integrated conception of sustainability has been put forward by Gibson et al (2005) which recognises the links and overlaps between the categories and does not treat the three pillars as 'warring houses'. They have identified eight core requirements for sustainability which integrate the pillars along with other sustainability considerations and have developed decision criteria for each, as well as general tradeoff rules for guiding decisions when sustainability considerations inevitably come into conflict (Gibson et al 2005). An attempt to apply the 'Gibson trade-off rules' was undertaken in the recent SA for the South-West Yarragadee groundwater proposal in Western Australia (Strategen 2005, chapter 3).

With respect to when integration occurs, generally speaking the EIA based approaches in Table 1 lend themselves to late integration in the SA process by approval decision-makers (i.e. because separate ESE impact assessments would be conducted which would only be integrated when drawing conclusions or making decisions about a proposal). In contrast, the 'higher' forms of SA in Table 1 enable earlier integration and by all stakeholders in the process (Morrison-Saunders and Therivel 2006). The provision of tradeoff rules and other considerations is intended to ensure that early integration does not come at the expense of individual ESE elements by unduly promoting one suite of interests over the others.

To further understand SA processes, Morrison-Saunders and Therivel (2006) suggest that the 'decision question' being contemplated needs to be considered (Table 2). This essentially refers to the nature of a particular proposal or its actual setting. In turn, this is largely a reflection of the alternatives available to be considered. A more specific question or development proposal (e.g. a mining proposal) generally limits the alternatives that might ensue while a more strategic and open-ended question or development proposal (e.g. a strategic land use plan) generates the broadest range of alternatives. The more alternatives there are and the broader they are, the greater the potential to select an option with the strongest sustainability characteristics. In other words, SA works best then it involves a relative evaluation of options to select the one that might be considered to be the 'most sustainable' rather than attempting to deliver an absolute judgement that a proposal 'is sustainable'.

**Table 2. Examples of decision questions that can be 'assessed' for ESE impacts** (Source: Morrison-Saunders and Therivel 2006)

	<b>Decision</b>	<b>Examples of application</b>
	What should the future of area Z be?	Development policy/plan for a region or local authority
	What is the best way of providing for demand for X?	Policy on energy provision, water provision
	What is the best way to address issue/problem X?	Provision of affordable housing or open space; dealing with inequities in access to services by deprived groups
	What is the most appropriate activity for site X, and under what circumstances should the activity be allowed to go ahead?	Residential/industrial/etc. zoning; development control activities associated with zoning
	How can existing activity X be made more sustainable?	Urban sprawl, logging operations, farming etc
	Which is the best alternative for undertaking proposal X from given options?	Constructing new harbour (range of configurations given), choice between two available technologies for industrial plant
	What is the best site to locate proposal X? Is proposal X acceptable at site Y?	New industrial project, mine site, location of gas processing facilities from offshore production

Finally, to understand the potential for SA processes to deliver on the most integrated and sustainable possible outcomes, Morrison-Saunders and Therivel (2006) combine the decision question and the assessment approach undertaken (Table 3).

**Table 3 – Linking the decision question with assessment approach and options for integration**  
(Source: Morrison-Saunders and Therivel 2006)

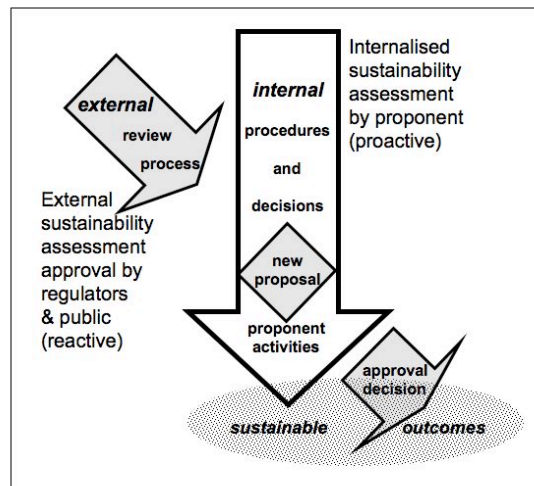
<b>Decision (from Table 3)</b>	<b>Most integrated level of assessment approach likely (from Table 2)</b>	<b>Comments (Implications for integration)</b>
What should the future of area X be?	Win-win-win, maximise objectives, full integration	Broadest question, with <i>most opportunities for early and full integration</i>
What is the best way of providing for demand for X?	Net gains, win-win-win, maximise objectives	Does not query whether demand should be provided for, but otherwise gives good <i>opportunity for early and full integration</i> .
What is the best way to address issue/problem X?	Net gains, win-win-win, maximise objectives, full integration	Encourages consideration of alternatives, with the <i>opportunity for early integration</i> . Will promote selection of most sustainable option.
What is the most appropriate activity for site X, and under what circumstances should the activity be allowed to go ahead?	Threshold, net gains, win-win-win, maximise objectives, full integration	Focuses on sustainable land use management, but considers plan/project alongside other alternatives and mitigation measures. Option for 'no development' exists. <i>Good opportunities for early and full integration</i> .
How can existing activity X be made more sustainable?	Any approach, but particularly full integration	Beyond the scope of normal impact assessment practice (i.e. not new proposal based). <i>Encourages integrated approach</i> . Leads to a more sustainable outcome than present situation, but no guarantee that it is 'sustainable'.
Which is the best alternative for undertaking Proposal X from given options?	Minimise impacts >> maximise objectives	Assumes that any of the given options will be acceptable (i.e. doesn't ask the bigger questions of: Do we need this proposal? or What is the best way to address issue?). Promotes selection of most sustainable option from the given list, though it does not affect the list itself. May or may not permit trade-offs depending on approach taken. <i>Option for early or late integration</i> .
What is the best site to locate Proposal X?	minimise impacts >> maximise objectives	Encourages consideration of alternatives. Does not consider whether proposal is actually sustainable. <i>Option for early or late integration</i> .
Is proposal X acceptable at site Y?	minimise impacts (+ extra considerations)	Focus on mitigating the negative effects. Does not attempt to determine sustainability, but rather acceptability. May enable project to be rejected if it has clear bottom lines or acceptability criteria; otherwise trade-offs between pillars are likely. Some modification of proposal may be possible to minimise negative impacts. <i>Late integration (i.e. at approval decision point by government)</i>

### **CASE STUDY EXAMPLES**

Before providing some case study examples from recent Western Australian practice in light of this framework for conceptualising the nature of SA processes, it is important to realise that internal processes adopted by proponents of development can make an enormous difference to sustainability



outcomes even before an external SA process is applied. Pope and Morrison-Saunders (2006) conceptualised this as depicted in Figure 1. A good example of effective use of an internal SA process by a proponent prior to external assessment by regulators can be found in LeProvost et al (2005). In this instance a sophisticated triple bottom line approach to site selection was used to choose the most appropriate location for a major resource development project in the north-west of Western Australia. The proponent's chosen option would subsequently be subjected to the appropriate government approvals processes. Many other proponents are similarly adopting sustainability processes to their internal decision-making. The examples that follow, however, focus on external SA processes applied by government to three recent resource development projects in Western Australia.



**Figure 1 – External and internal forms of sustainability assessment** (Source: Pope and Morrison-Saunders 2006)

### **Gorgon Gas Field**

The sustainability assessment process that was undertaken for the Gorgon Gas Field has previously been described in Pope et al (2004 and 2005) and this summary version is taken from Morrison-Saunders and Therivel (2006). The assessment of this development proposal was modelled on the existing EIA process in Western Australia.

*Question:* Can Gorgon gas processing facilities be located on Barrow Island (a nature reserve)?

*Approach:* Win/win/win – The assessment coincided with the State Sustainability Strategy prepared by the Government of Western Australia (2003). The draft and subsequent final version of this document viewed sustainability assessment in a triple bottom line approach with an emphasis on achieving simultaneous gains in each of the ESE pillars; thus the win/win/win approach was adopted as the guiding approach for assessment of the Gorgon proposal.

*What happened:* The proponent submitted an ESE document for public review. Independent reviews were conducted by the Environmental Protection Authority (EPA) and the Conservation Commission (i.e. both environmental agencies) and the Department of Industry and Resources (i.e. socio-economic combined). The idea was to use environmental offsets to ensure that a win/win/win outcome could be achieved. However the EPA (2003) concluded that no offset could compensate for loss of conservation values of Barrow Island by siting the gas facilities there. The proponent took a 'Barrow or nothing' approach (i.e. potential alternative sites were rejected by the proponent in the assessment). During the assessment, the proponent supplied confidential information concerning the economics of the case for Barrow Island to decision-makers, but this was excluded from the public domain.

The government decided to permit the facility on Barrow Island - hence there would be an economic gain for environmental loss (trade-off between pillars). The basis of the decision was not fully open or transparent because of the confidential economic information which influenced the final decision.

*Sustainability and integration:* The sustainability assessment approach specified up-front as the one being taken (i.e. win/win/win) could not actually be delivered. Either the approach should have been changed (i.e. to what eventuated in practice: *minimise impacts*) or the question should have been changed (i.e. to: What is the best site to locate the Gorgon gas processing facility?). Thus, either it was NOT a sustainability assessment or it was a failed sustainability assessment, depending on the viewpoint taken (Morrison-Saunders and Therivel 2006).

The Gorgon SA was conducted as separate ESE assessments right through to the final Cabinet approval decision (which was appropriate given the trade-off decision that had to be made). Thus it was a non-integrated assessment until the last possible moment.

### **South West Yarragadee Groundwater Scheme**

The proposal is for the extraction of 45GL/year of water from the Yarragadee Formation in the south-west of Western Australia with delivery of the water into the Integrated Water Supply Scheme servicing Perth (300km away) and some agricultural and goldfields districts in the region. The proponent is the Water Corporation; a state government agency.

*Question:* What is the most sustainable way of implementing the South West Yarragadee Water Supply Development based on the principles and objectives set out for this evaluation?

*Approach:* Win/win/win

*What happened:* The Water Corporation established a sustainability decision-making protocol which defined some 'goal posts', aspirational objectives and some 'bottom lines' to achieve in the SA process. A collaborative approach was undertaken and a Community Reference Group and a Sustainability Panel were formed accordingly to facilitate this process (Pope and Grace 2006). The SA commenced when the proposal was still in a conceptual stage which enabled the details of the proposal to be adapted as information was obtained on the ESE factors. This included redesign of the proposal to also supply water to communities in the south-west in the region of the borefield as well as mitigation and offset measures that might be required in order to deliver the net benefits in each of the ESE categories. A draft Sustainability Evaluation Report has been released (Strategen 2006) which incorporates the EIA requirements for formal assessment by the EPA as well as the broader sustainability evaluation of the proposal. Following review of the document by the public, government decision-makers and the Sustainability Panel, who will each comment on the acceptability of the proposal from their perspectives, final decision-making will be undertaken by the Minister for the Environment or Cabinet (Pope and Grace 2006).

*Sustainability and integration:* A more proactive and flexible approach was adopted for the South West Yarragadee project relative to the Gorgon proposal. Whilst the proposal was somewhat 'rubbery' (Pope and Grace 2006) and was considerably modified in an iterative manner during the assessment process, ultimately there were no real alternatives considered. Hence the question remains as to whether this groundwater scheme represents the most sustainable water supply option. However, there was a genuine attempt to ensure that the proposal delivered on the win/win/win approach in accordance with the vision of sustainability utilised.

The SA process was relatively integrated with clear objectives for each of the ESE categories being adopted at the outset. However, the requirement for EIA under the *Environmental Protection Act 1986* meant that the environmental component was ultimately somewhat detached from the other ESE categories when the impact assessment documentation was produced (i.e. the mandate of the EPAct limits the ability of the EPA to consider social and economic issues and they consequently required the proponent to separate them for the purposes of the formal EIA process).

### **Fremantle Outer Harbour**

This proposal is for a new port to be developed as an overflow facility when the existing Fremantle Harbour reaches capacity which is expected to occur in the near future. Two government agencies, Fremantle Ports and the Department of Planning Infrastructure (DPI), are joint proponents for this

development. The preferred site for the new harbour was identified in a planning exercise that was endorsed by Cabinet in 1996. While the location is fixed, the detailed design of the new port has been the main focus of this assessment.

*Question:* Which is best harbour alternative from four given options at Naval Base/Kwinana?

*Approach:* Minimise impacts (+ maximise benefits)

*What happened:* Like the South West Yarragadee proposal, this assessment commenced with a clear definition of the process to be followed guided by a sustainability decision-making protocol. Four possible harbour configurations were identified which have been examined to identify and assessment ESE impacts using multi-criteria analysis (MCA) with input from community and expert groups. Scores were allocated to specific criteria associated with the identified ESE impacts, weightings were developed for these criteria in a collaborative process involving stakeholders and selection of the preferred option was undertaken based on the scores and weightings of the criteria. The intention was to select the most sustainable option from the four harbour configurations considered. The preferred option chosen was a modified variation on one of the four original options (DPI 2006) and subsequently presented for public review in a Strategic Assessment Report (Oceanica Pty Ltd et al 2006). The proponents will revise their preferred option in light of advice received from the EPA and the Western Australian Planning Commission following the public review process.

*Sustainability and integration:* The MCA enabled ESE categories to be treated simultaneously in an integrated fashion (e.g. relative to traditional EIA). The assessment process had a high degree of influence over the decision on the best port configuration, due to the involvement of stakeholder groups in the MCA process. However, as Pope and Grace (2006) point out, in the greater scheme of things this influence is minimal because so many decisions, including the justification for the port and its location, occurred prior to commencement of the SA process. Thus the question remains: What if none of the alternatives are 'sustainable' (e.g. the proposed port is in the wrong location)?

### **CONCLUSIONS: FUTURE DIRECTIONS FOR SUSTAINABILITY ASSESSMENT**

The theoretical framework established in this paper presents a spectrum of possible approaches to what might be called sustainability assessment. The three examples of SA practice in Western Australia to date have all been different to each other and fall into different parts of this spectrum. So far, however, the assessments attempted have tended to occupy the 'lower' levels of the sustainability spectrum and largely revolve around impact minimisation as opposed to optimising sustainability objectives (notwithstanding that seeking positive outcomes has also been a goal of each assessment). This has largely been due to the relatively narrow scope of the decision question being posed. It also relates to the alternatives that have been considered. Clearly asking a more strategic question, or alternately, engaging in SA processes earlier in the project planning cycle will enable 'more sustainable' outcomes to be achieved. This demands an engagement in SA at the point of considering how needs or objectives can best be met (e.g. the best way to meet the demand for energy, water or infrastructure) and before individual project proposals have been decided on.

While the State Government's vision of sustainability assessment in a win/win/win context is admirable it will only be able to be achieved if more strategic and open decision questions are posed in future assessments. This obviously poses a considerable challenge to government decision-makers given the long and successful application of more reactive assessment tools such as EIA. It will also require proponents to engage government and the community earlier in their development planning procedures.

In short, effective SA demands new ways of thinking and acting. Practitioners can test and challenge the systems put in place by posing the question: How sustainable is sustainability assessment?; in light of the framework for SA put forward in this paper. Collectively, and through incremental improvement, it should be possible to improve SA practice and ensure that the outcomes of major development proposals achieve the most sustainable and integrated outcomes possible.



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