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EIA decision-making

Transparency in environment impact assessment decision-making: recent developments in Western Australia

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Transparency in decision-making, involving the establishment of explicit goals and objectives combined with open, facilitative procedures, has recently been advocated as an important principle for effective environmental impact assessment (EIA). This paper examines recent changes to EIA practice in Western Australia that emphasise clear procedures for decision-making. Current practices focus on objectives established for relevant environmental factors identified during the screening and scoping stages of EIA. These objectives are then used as decision criteria for project decision-making following public review. An example from a recent assessment is provided. Some strengths and weaknesses of this approach to transparent EIA decision-making are also examined.

Keywords: decision-making; effectiveness; transparency; Western Australia

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IN THE INTERNATIONAL STUDY of the Effectiveness of Environmental Assessment, Sadler (1996, page 22) identified transparency in decision-making as an important principle for effective environmental impact assessment (EIA). The treatment of this concept in the EIA literature is briefly reviewed before describing recent changes to EIA practices in Western Australia that have greatly enhanced the transparency of decision-making by the Environmental Protection Authority (EPA). Following an example, the paper concludes with some reflections on the strengths and weaknesses of transparent EIA decision-making.

The way in which decisions are reached in EIA and the manner of their communication are two factors that contribute to the effectiveness of a particular process. Ortolano *et al* (1987) consider EIA to be effective when environmental impacts are accounted for by project decision-makers in the course of planning, and hence some weight is given to environmental factors during project decision-making (Ortolano, 1993).

Sadler (1996, page 16) notes that decision-making requires striking a balance between economic, environmental, social and other criteria. Thus it is a political process involving trade-offs rather than a purely scientific undertaking. He states that, because the trade-off process takes place largely behind 'closed doors', in practice, only a generalised understanding of how decisions are actually reached in such cases is evident to the public. There is room for improvement in EIA here, and it can be achieved through having open communication processes or transparency in how decisions are reached.

During a review of EIA procedures at the national level in Australia, the Commonwealth Environmental Protection Agency (CEPA) identified eight guiding principles it considered appropriate for the development of an effective and efficient EIA system: participation; transparency; certainty; accountability; integrity; cost-effectiveness; flexibility; and practicality (CEPA undated, page iii). When defining these principles it states that (CEPA undated, page 15):

> "Transparency requires that all factors relevant to assessment decisions are clearly identified by the decision-maker. For example, the factors taken into account by the assessing authority in determining the appropriate form of assessment should be clearly defined."

The notion of transparency directly affects several of the other eight guiding principles for effective EIA. CEPA (undated, page 15) states that a transparent process provides certainty in the EIA process through ensuring all obligations, opportunities and decisions in the procedure are clearly set out. It also partially provides accountability to participants and stakeholders, and makes the EIA decision-makers accountable. The need for EIA processes and practitioners to be accountable to the public has been highlighted by Sippe (1990) and Canadian Environmental Assessment Agency and Environment Canada (1996).

Finally, the integrity of an EIA system, which is important for ensuring that all participants have faith in the outcomes, can be achieved in part through having "an open, transparent system with clearly defined objectives and processes and realistic opportunities for participation by all stakeholders" (CEPA undated, page 16).

Subsequently, in examining the opportunities for public participation in the Australian EIA system, Kinhill Engineers Pty Ltd (1994, page 5) stated that adequate and appropriate opportunities for participation are an essential contributor to the transparency of the EIA process. Other authors have since identified transparency as an important element of effective EIA. Ridgway *et al* (1996, page 72) reiterated the guiding principles for EIA established by CEPA (undated). They defined EIA transparency in the context that "all assessment decisions, and their basis, should be open and accessible".

Bisset (1996) states that a basic principle of EIA is that it should be transparent in that the process should have clear, easily understood requirements for EIA content; it should ensure public access to information; identify the factors that are to be taken into account in decision-making; and acknowledge limitations and difficulties in decision-making. Sippe (1997) further identifies the need for 'understandability' in EIA decision-making.

Coupled with transparency, the steps in the decision-making process have direct bearing on the effectiveness of EIA process. Sadler (1996, page 23) and Ridgway *et al* (1996, page 74) advocate that EIA should provide the basis for environmentally sound decision-making in which terms and conditions are clearly specified and enforced. Compliance with rules and procedural requirements for EIA by decision-makers is important for effective EIA (Ortolano *et al*, 1987, Ortolano, 1993).

Several of Sadler's 14 principles for the design and development of effective EIA processes are of particular interest with respect to the way in which decisions are reached in EIA and the communication of those decisions (Sadler 1996, page 22):

> explicit goals and objectives: a clear purpose and dedication to achieving environmental protection and/or sustainable development (Sadler (1996, page 23) and Ridgway *et al* (1996, page 74) further advocate that successful EIA practice will result in acceptable development projects that meet environmental standards and resource management objectives);
> uniform, consistent application: automatically applied to all proposals and actions with potential significant environmental effects and consequences;
> open, facilitative procedures: transparent and readily accessible, with a traceable record of assessment decisions and timely opportunities for public involvement and input at key stages;
> 'best practice' standards: undertaken with professionalism, objectivity and credibility, as identified by 'best-practices' in impact science, public consultation and process administration; and
> efficient, predictable implementation: applied in a timely manner that fosters certainty, minimises delay and avoids unnecessary burdens on proponents.

Recent changes to EIA procedures in Western Australia (WA) have seen a shift to a process more consistent with these principles. EIA in WA has been constantly evolving since its beginnings in the early 1970s, including substantial changes brought about by several formal reviews of procedures, and the process has always been open to public scrutiny and participation. However, in the time since the most recent set of administrative procedures were produced (EPA, 1993), EIA decision-making processes have become even more transparent and are consistent with the principles for effective EIA espoused by Sadler (1996). These changes are explored in the remainder of this paper.

The EIA process in WA has two unique features: the EPA's statutory guarantee of independence from political direction; and the primacy of the environmental decision by the Minister for the Environment, combined with the legal status of any implementation conditions

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WA approach to EIA decision-making

The EIA process in WA has been well documented by Wood and Bailey (1994) who noted two outstanding characteristics. First is the statutory guarantee of independence from political direction that is enjoyed by the EPA. Second is the primacy of the environmental decision by the Minister for the Environment, who acts on the advice of the EPA, over all other decisions, combined with the legal status of any implementation conditions. These are unique features absent in other states and territories in Australia (Harvey, 1998, page 77).

Another distinguishing feature of EIA in WA relative to other practices in Australia is the formal provision of a public review period for all levels of assessment and the requirement for the proponent to respond to the public submissions (including comments by government agencies) prior to the EPA's assessment of a proposal (Harvey, 1998, page 68). This is an important feature of the EIA process that ensures that the process is both transparent and accessible to the public. The remaining discussion focuses on specific steps undertaken in the assessment process in WA which enable the public to understand the basis of the decision-making process and to ensure that decision outcomes are more accountable.

In WA, the EPA is provided for by the *Environmental Protection Act 1986* (EPAct) and is responsible, amongst other roles, for administering the EIA process. Section 40(3) of the Act provides global power to the EPA to "determine the form, content, timing and procedure of any environmental review". The EPA has recently exercised this discretionary power by modifying its approach to EIA.

Wood and Bailey (1994) noted that there is a great deal of information available about the Western Australian EIA system. The current Chairman of the EPA has recently contributed to this body of information to explain the EPA's approach to EIA (Bowen, 1997). The role of the EPA through the EIA process is to give independent environmental advice to the Government (via the Minister for Environment) who is then jointly responsible for decision-making.

The Government is responsible for determining the balance between environment and development in light of the EPA's environmental advice as well as other advice covering political, economic, social and cultural issues (EPA, 1993, page 5). In WA, EIA "is aimed at resolving questions of 'how to' manage projects so the environment is protected rather than to say 'yes' or 'no' to development" (EPA, 1993, page 5).

This approach of 'how to manage' a project is reflected in the reporting requirements of the EPA to the Minister for Environment (Bowen, 1997). Section 44(1) of the EPAct specifies that the EPA is required to report to the Minister on:

> the environmental factors relevant to a particular proposal; and
> the conditions and procedures, if any, to which any implementation of that proposal should be subject.

The EPA may also make such recommendations in its report as it sees fit. These generally relate to environmental conditions and procedures. This approach to EIA focuses on environmental management activities (Bailey, 1997). The Western Australian EIA system has been recognised previously as one of the best in the world (Wood, 1994). Bowen (1997) states that the current EPA wants to build on this under the "principle of continuous environmental improvement in environmental management".

Changes in EIA process

In 1993, the membership of the EPA underwent major changes following a change in Government. Prior to this, the EPA's conclusions and recommendations on each project undergoing EIA were clearly stated in their publicly available report to the Minister. However, the process by which the EPA reached its conclusions was not always apparent; it was not reduced to a factor-by-factor approach.

With a change in EPA membership came a change in the process of EIA, leading to the EPA's decision-making becoming more transparent. This research was not elicited to determine why this was the case. To some extent the changes in EPA decision-making were a natural extension of a move in this direction already begun by the previous EPA of which one of the authors was a member. Alternatively the changes may reflect different scientific and political ideologies promoted by the change in Government and EPA membership.

The approach adopted by the current EPA is to focus on the relevant environmental factors (consistent with the specific wording of S44(1) of EPAct) for a particular proposal; this focus occurs from screening and scoping through to evaluation and assessment by the EPA. With respect to other approaches to EIA within Australia, this appears currently to be a unique feature of WA practice (Harvey, 1998, pages 72–77).

For each proposal, the EPA, in association with the proponent and following consideration of inputs of information from government agencies and the public, identifies the principal elements of the environment likely to be impacted by the proposal (Bowen, 1997). The identification of key issues and impacts that need to be addressed during this stage of EIA is a 'generic step' in normal practice (Sadler, 1996, page 19).

Screening and scoping

At the screening stage, a standardised filtering table with check boxes is used to identify 'topics' that apply to the proposal, and the level of assessment is subsequently determined by the EPA Chairman (Bailey *et al*, 1998, page 22). During scoping, another checklist is used to establish the key environmental factors to be addressed by the proponent for each of the screening topics. This is a generic check sheet which links environmental factors with environmental objectives established by the EPA (Bailey *et al*, 1998, page 28).

The EPA endeavours to focus attention on the objective for each environmental factor so that all interested parties will be aware of those matters against which the impact of a proposal will be judged (Bowen, 1997).

The objectives are determined from a variety of sources including:

- the prescriptive requirements of existing legislation (for instance, the *Wildlife Conservation Act 1950*, WA);
- existing guidelines (for instance, *National Strategy for the Conservation of Australia's Biological Diversity*) or standards (for instance, pollution emission levels) set through national or state councils, agreements, strategies, legislation or regulations;
- Environmental Protection Policies previously established by the EPA under the EPAct;
- a series of EIA policies in the form of "guidance documents for the assessment of environmental factors" prepared by the EPA in recent years; and
- recommendations of the EPA for projects that have previously undergone EIA in Western Australia.

Bowen (1997) notes that objectives for some factors, such as noise, can be in quantitative terms but for others application of the objective will still require a degree of judgement. Stating the environmental objectives that apply to a particular proposal during the scoping stage is a serious attempt to make the goals of EIA clear and provides a structure for what follows. Ultimately it leads to a more transparent way of reaching the conclusion that a particular proposal is environmentally acceptable, on the grounds that it is able to meet the EPA's objectives for individual environmental factors.

Bowen (1997) states that the key reason for developing objectives for environmental factors is to provide a degree of certainty for proponents about the environmental performance expected by the EPA. To improve this process, the EPA has recently commenced preparation of a series of EIA policies on matters not covered by existing standards as a guide for proponents and the public generally, as well as to assist the EPA in its consideration of proposals.

As at the 31 March 2000 there were 11 "Guidance for the assessment of environmental factors" documents available from the EPA addressing specific issues or sites (for instance, "Management of air emissions from biomedical waste incinerators" and "Protection of the Lake Clifton catchment") as well as more general matters (such as "Guidance to assist proponents in understanding the EPA's requirements in relation to the environmental condition on environmental management systems" and "Linkage between EPA assessment and management strategies, policies, scientific criteria, guidelines, standards and measures adopted by National Councils").

The EPA continues to maintain a discretionary approach to EIA and considers each proposal individually as a separate and unique entity despite providing guidance to proponents on its expectations. However, Bowen (1997) notes that, if a proposal readily falls within the scope of the environmental objectives specified in the EIA policies and elsewhere, the timeliness and certainty of EPA reporting on that proposal will be improved considerably.

Document preparation

Once scoping is completed, draft guidelines for the preparation of the proponent's EIA document are established. Consultation with relevant decision-making authorities, other involved agencies, the proponent and, for major proposals, identifiable public groups that will be affected is undertaken to finalise the EIA document guidelines. Sadler (1996, page 95) maintains that, from an effectiveness standpoint, it is important that reasons for screening and scoping decisions are transparent and defensible and the Western Australian approach clearly meets this expectation.

The proponent is expected to prepare the EIA document in accordance with the EPA guidelines, which are included as an appendix to the EIA document. The EPA determines the acceptability of the EIA document for public review prior to its publication (EPA, 1993, page 17).

The EPA requires the proponent to provide information in the EIA document on each of the factors previously considered relevant to the proposal being assessed. This information needs to be in sufficient detail to enable the EPA to be confident that the impact will either not compromise the EPA's objectives, or that the commitments for mitigation action to be taken by the proponent will ameliorate the impact so that the objectives will not be compromised (Bowen, 1997). If not satisfied with the proponent's proposed mitigation measures, the EPA may make recommendations for additional environmental management action to be taken that will meet the objectives.

Bowen (1997) notes that, for objectives which have clear technical standards and which can be easily measured, there is little debate on the environmental acceptability. However, he acknowledges that, for many of the factors (biological, physical or social), either the information provided requires a degree of judgement by the EPA or it is simply not possible to provide the information until the project has been in progress for some time and the required information gathered and analysed. Hence a more flexible and discretionary approach is still required for the less tangible environmental factors.

Evaluation and assessment

When evaluating the proponent's EIA document, the EPA uses the objectives established for the relevant environmental factors as the basis for its assessment report to the Minister for Environment. This is a serious attempt to test projects against the clearly established goals for EIA. In doing so, the EPA has clearly:

identified the environmental factors it considers to be relevant to the proposal (that is, in the guidelines issued to the proponent);
stated the standard or expectation for management of each environmental factor (that is, the objectives); and
evaluated the project on the basis of whether the objective for each environmental factor can be met.

The EPA's report to the Minister is publicly available, hence ensuring that the EPA's decision-making process itself is open and accountable. The final decision-making process by the Minister is not so evident. The EPA report is a significant input to the final, necessarily political, decision by the Minister.

Agreement between the EPA's recommendations to the Minister and the subsequent Ministerial conditions of approval can sometimes be exact, but on other occasions there can be differences. These disparities may arise from public appeals against the EPA recommendations that have been upheld, negotiations with other regulatory or decision-making agencies affected by a proposal, or political decisions made by the Minister directly. Accountability for the final decision is provided for by making the approval conditions publicly available.

An example that demonstrates the way in which decisions were reached during EIA of a recent proposal in Western Australia follows.

Stirling–Harvey reservoirs redevelopment

This proposal by the Water Corporation of Western Australia involved the redevelopment of several existing reservoir water supplies located some 120km south of the capital city of Perth in the south-west of the state in order to service the Perth Metropolitan Water Supply. Previously these water supplies were used for irrigation and town water supply in the vicinity of the reservoirs only. It included the following project elements (Welker Environmental Consultancy, 1999):

construction of a new pipeline (16km) between the existing Harris and Stirling reservoirs;
construction of a new pipeline (19km) between the existing Stirling and Harvey reservoirs (the two pipelines combined enable the three reservoirs to be connected to the existing water trunk mains servicing Perth);
construction of a new and larger dam on the Harvey River 800m downstream from the existing reservoir which will inundate an additional 16km of riverine areas of the Harvey valley; and
relocation of 7.5km of the Harvey–Quindanning Road.

Key environmental issues for the Stirling–Harvey reservoirs redevelopment include: noise, vibration and dust during construction; and inundation of riverine flora and fauna habitat, private properties, pine plantations, and several heritage sites

Key environmental issues for the proposal include:

noise, vibration and dust during construction;
inundation and loss of riverine flora and fauna habitat (which is relatively scarce given the generally dry nature of the WA climate, and that most rivers in the south-west with water supply potential have already been dammed);
inundation of private properties and pine plantations; and
inundation of several Aboriginal and European heritage sites.

Environmental objectives

The processes of identification of environmental objectives during scoping and subsequent assessment of predicted impacts against these during evaluation of the proponent's EIA report were represented in a series of tables produced by the EPA. During scoping, a generic checklist was transformed into a specific table included in the guidelines issued to the proponent (see Table 1). The first two columns identify the content of work to be addressed in the EIA document and the second two outline the scope of work required to be undertaken. The factors in the first two columns are split into 'biophysical factors' (for instance, vegetation communities, fauna, surface water quality, noise and vibration, and dust and particulates), 'pollution management' (for instance, air, soil contamination, groundwater contamination, and non-chemical emissions) and 'social surroundings' (for instance, visual amenity, Aboriginal heritage, recreation, traffic, and public safety). EPA objectives are identified in the third column and the fourth outlines the work required to be undertaken during preparation of the EIA document. An example of the application of this approach to scoping for the issue of terrestrial fauna management follows.

In Table 1, it can be seen that the environmental factor 'Terrestrial fauna' is divided into two site-specific factors in the second column, to differentiate the 'Specially protected (threatened) fauna' from native fauna generally, and that different environmental objectives are established for each in the third column. For terrestrial fauna generally, the EPA objective is broad, being simply to "maintain the abundance, species diversity and geographical distribution". The EPA objective for the specially protected (threatened) fauna is based on meeting the provisions

Table 1. Extracts from 'Environmental Factors Relevant to This Proposal' table for Stirling–Harvey reservoirs project

Content		Scope of work	
Factor	**Site-specific factor**	**EPA objective**	**Work required for the environmental review**
BIOPHYSICAL			
Terrestrial fauna		Maintain the abundance, species diversity and geographical distribution of terrestrial fauna.	Baseline studies to identify existing usage of area of proposed inundation by terrestrial fauna.Detail measures proposed to ensure protection or rehabilitation of fauna habitat, including that downstream of the proposed dam.
	Specially protected (threatened) fauna	Protect specially protected (threatened) fauna, consistent with the provisions of the Wildlife Conservation Act 1950.Protect threatened fauna and priority fauna species and their habitats, consistent with the provisions of the Wildlife Conservation Act 1950.	Baseline studies to identify existing usage of area of proposed inundation by specially protected (threatened) or threatened fauna and priority fauna species.Detail measures proposed to ensure protection or rehabilitation of any specially protected (threatened) or priority fauna species or habitat.
Wetlands	Watercourses	Maintain the integrity, functions and environmental values of watercourses.	Baseline studies to identify existing environmental values of watercourse proposed for inundation.Detail measures proposed to ensure protection and enhancement of environmental values of watercourses.
POLLUTION MANAGEMENT			
Air	Particulates and dust	Ensure that the dust levels generated by the proposal do not adversely impact upon welfare and amenity or cause health problems by meeting statutory requirements and acceptable standards.	Detail measures proposed to ensure impact from construction activities comply with particulates and dust statutory requirements and guidelines, and do not impact on the amenity of nearby residents.
Non-chemical emissions	Noise and vibration	Protect the amenity of nearby residents from noise and vibration impacts resulting from activities associated with the proposal by ensuring that noise levels meet statutory requirements and acceptable standards.	Detail measures proposed to ensure impact from construction activities and blasting comply with statutory noise and vibration requirements and guidelines, and do not impact on the amenity of nearby residents.
SOCIAL SURROUNDINGS			
Aesthetic	Visual amenity	Visual amenity of the area adjacent to the project should not be unduly affected by the proposal.	Detail measures proposed to ensure the dam and pipelines do not unduly impact on the visual amenity of the area adjacent to the project.
Culture and heritage	European heritage	Comply with statutory requirements in relation to areas of cultural or historical significance.	Baseline studies to detail existence of sites of European significance in the proposal site. Detail measures proposed to ensure the proposal complies with statutory requirements in relation to places and sites of European heritage significance.
Recreation		Not to compromise recreational uses of the area, as developed by planning agencies.	Detail measures proposed to ensure impacts from altered streamflow and water quality protection measures do not adversely affect water based recreation in the area.

Source: Welker Environmental Consultancy (1999, Appendix 1)

of the *Wildlife Conservation Act 1950*. For both, the work required for the environmental review outlined in the fourth column involved baseline studies to understand the existing usage of the areas by terrestrial fauna and to detail environmental management measures proposed to protect or rehabilitate fauna habitat disturbed during project construction and operation.

It can be seen that this is a relatively prescriptive approach to EIA with the EPA taking responsibility for specifying the content of the EIA study, although fine details are at the discretion of the proponent. This scoping table is required to be reproduced along with the rest of the EPA guidelines as an appendix in the proponent's EIA document. Hence the outcome of the scoping process used by the EPA to identify relevant environmental factors for a proposal is transparent. This table also provides the basis for subsequent assessment of proposals by the EPA following the public review period.

Identification of relevant environmental factors

There are two key tables that appear in recent and current EPA reports that relate objectives to relevant

Table 2. Extracts from 'Identification of Relevant Environmental Factors' table for Stirling–Harvey reservoirs project

Factor	Proposal component with possible impact	Government agency and public comments	Identification of relevant environmental factors
BIOPHYSICAL			
Terrestrial fauna	Clearing or inundation of native vegetation has the potential to impact on the habitat of native fauna.	**Public** Lot 500 includes 200 acres of land registered with CALM [The Department of Conservation and Land Management] as "land for Wildlife" registration number 68. If the pipeline goes through Lot 500 it will cause considerable disturbance to habitat trees including those frequented by red tailed black cockatoos and rare river banksia. The road pipeline option should be given further consideration as an alternative route to avoid these impacts.	The alignment of the Stirling–Harvey pipeline through Lot 500 (as with the majority of the pipeline in forested areas) follows an existing track and the maximum disturbance width for the pipeline will be 20 metres, which will be rehabilitated soon after pipeline construction. The impacts of this disturbance on fauna are therefore unlikely to be significant and can be managed in the detailed design and implementation of the project. The proposed management is outlined in the proponent's [EIA document] and rehabilitation commitments and will be detailed in the proposed Fauna Management Plan which will be prepared in consultation with CALM and the DEP (Department of Environmental Protection). Factor does not require further EPA evaluation.
Specially protected (threatened) fauna	Clearing and inundation associated with the new Harvey Dam and Stirling–Harvey pipeline has the potential to have a significant impact on the northernmost natural population of the Schedule 1 specially protected species the western ringtail possum.The general locality is also being used for reintroduction of the woylie and the noisy scrub birds.	**Government** – CALM has advised that it will need to be closely consulted in relation to a management strategy for the western ringtail possums. **Public** – Approximately 1.2ha would be affected by the proposed Stirling–Harvey pipeline on Lot 11 (based on 18m clearing width over 654m) resulting in a significant loss of habitat. The [proponent] only intends to replace cleared vegetation along the pipeline with local understorey vegetation which would result in the permanent loss of habitat for the remaining populations of western ringtail possum and other priority species as listed in the [EIA document]. – The carpet python is also recognised as a rare species in the [EIA document] whose habitat includes granite outcrops. The proposed pipeline route could significantly impact on remnant populations of the carpet python which local residents have identified in granite outcrop areas within 500m of Lot 11, and by association is also likely to live within the granite outcrop areas of Lot 11.	Considered to be a relevant environmental factor.
SOCIAL SURROUNDINGS			
Visual amenity	The construction of the new Harvey Dam and the Harris–Stirling and Stirling–Harvey pipelines may have the potential to adversely impact on the visual amenity of particular areas within the Harvey River Basin.	**Public** A 1.4 metre permanently placed pipe and the associated vegetation clearing will result in major irreversible impacts on the landscape.	Considered to be a relevant environmental factor.
European heritage	The construction of the dam will lead to the inundation or relocation of a number of areas and buildings of European heritage significance.	**Public** It appears that Jardup homestead will be inundated by the proposed redevelopment. The grave of Ephraim Mayo (Bunbury's first mayor and an MP) may be located nearby and perhaps he and other pioneers of the area should be commemorated in some way.	Factor can be effectively managed in accordance with relevant legislation such as the Western Australian Heritage Act 1972 and the proponent's commitment to prepare a Heritage Management Plan to the requirements of the Heritage Council of WA (Commitment P34). Factor does not require further EPA evaluation.

Source: EPA (1999, pages 10–15)

environmental factors and to the evaluation process. The first is normally titled 'Identification of relevant environmental factors' and is set out as shown in Table 2. The middle columns contain summaries of

the identified potential impacts and responses from government agencies and the public obtained during the public review period. In the final column, the EPA includes any additional factors they have noted from their assessment and then provide one of the following options: 'Factor does not require further EPA evaluation' or 'Considered to be a relevant factor'. The process that the EPA uses to determine which factors are relevant to the evaluation and decision-making stages of EIA is transparent.

The previously used example of terrestrial fauna can be tracked through Table 2 where this environmental factor again is divided into general native fauna and specially protected (threatened) fauna. Public comments on the former (third column) raised concerns about disturbance to red tailed black cockatoo associated with pipeline construction through a particular reserve, and questioned the route selected. In their response (fourth column) the EPA reiterated the proponents reasons for route selection and noted their commitment to management and rehabilitation: they concluded that this factor "does not require further EPA evaluation".

For the specially protected (threatened) fauna, there are comments by both a government agency and the public which identify specific concerns for two fauna species (western ringtail possum and carpet python), which the EPA subsequently considered "to be a relevant environmental factor" in the fourth column of the table. Detailed assessment of this issue is carried over into the next EPA table.

Assessment of relevant environmental factors

The second table included in current EPA reports is titled 'Summary of Assessment of Relevant Environmental Factors' (Table 3) and contains five columns. The first column lists the biophysical or social surroundings factors that were considered to be relevant from the previous table. The 'Relevant area' column is used to isolate individual components of the project and surrounding environment, and provides an indication of the scope of the factor under consideration. The third column presents the EPA's objectives for management of the particular environmental factor.

The information provided in the 'EPA assessment' column is based on predictions made in the proponent's EIA document, environmental management commitments made by the proponent in the EIA document and in response to public submissions, the content of the public submissions themselves as well as any advice that the EPA has sought from experts. This information is synthesised with respect to environmental management commitments in the final (fifth) column, and the EPA expresses its advice to the Minister for Environment on whether its objectives for that particular environmental factor can be met and on how the factor should be managed.

In Table 3, the EPA assessment on the issue of specially protected (threatened) fauna is clearly articulated. In column two the specific components of the project affecting this fauna are identified as the area to be inundated by the new Harvey Reservoir and the area disturbed during construction of the Stirling–Harvey pipeline. The EPA objective in column three for specially protected (threatened) fauna relates to the provisions of the *Wildlife Conservation Act 1950* as per Table 1.

The EPA assessment in column four indicates that consultation was undertaken with the Department of Conservation and Land Management (CALM) concerning management of the western ringtail possum and it also reiterates the proponent's commitment for management of habitat for this species. Column five presents the EPA's advice to the Minister. On the basis of the proponent's commitments to prepare a fauna management plan and to rehabilitate 35 hectares of habitat for western ringtail possum which will be undertaken to the requirements of CALM, the EPA considers that "the proposal can be managed to meet the EPA's objective for this factor".

EPA decision

In the Stirling–Harvey example provided, the EPA indicated that their objective for each relevant environmental factor could be met. This led the EPA (1999, page ii) to conclude overall that

> "the proposal is capable of being managed to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions summarised in Section 4 [of the EPA's report], including the proponent's commitments."

Similarly, in cases in which the EPA recommends to the Minister that the project should not proceed, the reasons provided are related back to the EPA objective established for individual environmental factors.

Wood and Bailey (1994) noted that the EPA's report and recommendations document to the Minister is, in effect:

> "a summary document for the whole EIA procedure and usually contains not only a list of public comments and responses but an account of the proposal and its environmental impacts, together with the proponent's environmental commitments and the EPA's detailed recommendations."

In the Stirling–Harvey example, the proponent's environmental management commitments were summarised in Section 4 of the EPA's report along with the EPA recommendations; these were both presented in full detail in a legal format in Appendix 3 of the report (EPA, 1999). There are two advantages of this approach. First the public can clearly see the approval decision and conditions established by the EPA. Secondly, assuming that the Minister supports the EPA's assessment for the project and that there are no upheld

Table 3. Extracts from the 'Summary of Assessment of Relevant Environmental Factors' Table for the Stirling-Harvey Reservoirs Project

Relevant factor	Relevant area	EPA objectives	EPA assessment	EPA advice
BIOPHYSICAL				
Specially protected (threatened) fauna	Harvey reservoir Stirling–Harvey pipeline	Protect specially protected (threatened) fauna species and their habitats, consistent with the provisions of the Wildlife Conservation Act 1950.	Advice from CALM indicates that it considers that the proposal will not have an unacceptable impact on the conservation status of the western ringtail possum provided the proponent's commitments are implemented.The proponent has committed to restoration of 35 hectares of peppermint forest including transplantation of mature peppermint trees as potential habitat for the western ringtail possum. The proponent has also committed to establishing habitat for the species in the 104 hectare buffer vegetation area surrounding the new Harvey dam.	Having regard to the proponent's commitments to: – prepare and implement a fauna management plan to the requirements of CALM; and – rehabilitate 35 hectares of Lowdon complex vegetation within peppermint rehabilitation areas and provide for habitat within the 104 hectare reservoir buffer revegetation areas;and the advice of CALM, it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for this factor.
SOCIAL SURROUNDINGS				
Visual amenity	– Harvey Dam – Stirling–Harvey pipeline	Ensure that the visual amenity of the area adjacent to the project should not be unduly affected by the proposal.	The EPA notes that: – the disturbance zone for the Stirling–Harvey pipeline will be permanently visible along its length because of the need for the line to be navigable by suitable off road vehicles for pipeline repair or maintenance purposes; – there is some potential for adverse visual impacts around the edge of the new Harvey dam if vegetation within the 75–78 metre AHD [Australian height datum] inundation zone is killed by waterlogging; and the proponent has committed to visual screening of the dam wall for land owners close to the dam if this is requested by the landowner.	Having regard to the proponent's commitments, it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for this factor.

Source: EPA (1999, pages 50–55)

appeals against the EPA recommendations (which was the case for this example), the EPA's recommendations and proponent's commitments become legally binding conditions of approval and they can be implemented exactly as presented to the public in the EPA document.

Hence there is full transparency of the EPA's role in the EIA decision-making process. The disclosure to the public of the EPA's recommendations and decision-making process essentially establishes a public expectation of EIA outcomes for a particular project which may make it politically difficult for the Minister to ignore or override without good cause and explanation (appeals against the EPA recommendations which are upheld are one such avenue for this).

Strengths and weaknesses of EIA transparency

A summary of the guiding principles for EIA transparency and a comparison with current Western Australian practices is provided in Table 4. The approach used by the EPA is consistent with the framework for reviewing EIAs espoused by Sadler (1996, pages 123–124) who maintains that:

> the terms of reference for reviewing an EIA document (for instance, in the form of scoping guidelines) should be provided;
> existing reviews of EIA reports for comparable activities in similar settings should be considered (that is, these form the basis of the EPA's scoping guidelines); and
> other review criteria such as "environmental standards or criteria about emission levels and environmental qualities" directly related to a proposal should be considered.

There are a number of strengths and weaknesses of this approach to EIA.

The strength of this assessment process is that a clear understanding of the basis of the EPA assessment

Table 4. Attainment of EIA Decision-Making Transparency Principles in Western Australia

Principles for transparency in EIA	Approach adopted in Western Australia
Clearly defined EIA processes (CEPA, undated, page 16)	The EIA process is well defined with guides to the process provided free of charge to the public (eg EPA, 1993).
Uniform and consistent application of EIA to all proposals and actions likely to have a significant effect on the environment (Sadler, 1996, page 22)	The EPA adopts a discretionary approach to screening and considers the merits of each proposal or action. The EPA identifies the environmental factors relevant to a particular proposal or action during scoping and a formal EIA process is consistently followed.
Explicit goals and objectives for environmental protection and/or sustainable development (Sadler 1996, page 22)	Overarching objectives for EIA in Western Australia are outlined in the Administrative Procedures (EPA, 1993). The basis of the EPA's decision-making process is clearly articulated commencing with the identification of the environmental factors in the scoping guidelines. For each relevant environmental factor the EPA undertakes the following in its assessment report: – establishes an environmental objective (sourced from relevant existing legislation, guidelines and standards, EIA policies and environmental protection policies, or from previous assessment reports); – identifies the predicted adverse impacts; – summarises government agency and public comments; – states the proponent commitments for environmental management; – andclearly states the EPA's assessment and advice to the Minister.
Open, facilitative procedures with a traceable record of assessment decisions (CEPA, undated, page 16; Sadler, 1996, page 22)	The EPA's environmental objectives are stated in the scoping guidelines issued to proponents which are reproduced in the proponent's EIA document. The EPA's assessment report and recommendations on a proposal are publicly available (free of charge). The decision by the Minister for Environment is made available to the public in the EPA library.
Timely and realistic opportunities for public participation plus public access to all available information (CEPA, undated, page 16; Kinhill Engineers Pty Ltd, 1994, page 5; Sadler, 1996, page 22)	The EIA process enables several opportunities for public participation and access to information including: – referral of proposals to the EPA for possible assessment;screening decisions of the EPA are published weekly: – for projects that are formally assessed, the period of public review and information on how the public can obtain copies of the EIA documents is recorded in the advertisement; – any member of the public can appeal against the screening decision of the EPA and the level of assessment can only be increased; – a public review period of 4–10 weeks occurs for all proposals formally assessed; – summaries of public comments are provided to the proponent and they are required to respond: – the public comments and proponent's response are included in the EPA's assessment report; – the EPA's report and recommendations to the Minister is publicly available: – any member of the public may appeal the EPA's report and recommendations prior to the Minister making a decision; and – a record of the Minister's decision is publicly available.

emerges and this is combined with considerable opportunities for public participation and information sharing. With this system, it is relatively simple to determine the extent to which environmental factors are accounted for by the decision-makers and the extent to which projects are modified during the decision-making process. These are both common measures of effectiveness of EIA cited in the literature (for instance, Ortolano *et al*, 1987; Ortolano, 1993; Lee *et al*, 1994; Wood, 1994; Barker and Wood, 1999). Additionally, from the clear disclosure in the EPA's assessment report, the public is able to understand how its submissions are firstly responded to by the proponent and secondly how this input subsequently influences the EPA's decision-making process.

Another strength is that the EIA process for a proposal is related to the wider context of environmental management for the relevant environmental factors. A problem with project level EIA is that it usually occurs in a policy and programme vacuum which is insensitive to the broader perspective. By establishing objectives for environmental factors, the EPA is framing each proposal in a regional context. In this way, it would be possible to link proposal outcomes for each environmental factor to sustainability performance indicators.

Ridgway *et al* (1996, page 560) consider that information important for EIA decision-makers in a project context includes the background to the project and identification of the most important environmental issues involved. In a policy context, information on the relationship between the proposal and environmental protection goals, policies and plans is important for decision-makers (Ridgway *et al*, 1996, page 560).

In recent assessments the EPA has taken a step towards overcoming the risk of being reductionist by introducing an overarching factor 'biodiversity', which is one indicator of ecosystem integrity, into the scoping guidelines

A potential weakness with the EIA process adopted by the EPA in Western Australia is that it risks being reductionist. There is a danger that, by breaking each proposal down into discrete parts and assigning environmental objectives to them, it may not adequately represent overall environmental functions. It could be a problem, for example, if in the process of reduction, there was no provision for system-wide objectives such as ecosystem maintenance. In this circumstance, it would be possible for each environmental factor to meet the minimum requirements of the EPA's environmental objectives but for the cumulative effect of all of the proposal impacts acting together to have unacceptable environmental consequences.

In recent assessments the EPA has taken a step towards overcoming this through the introduction of an overarching factor 'biodiversity', which is one indicator of ecosystem integrity, into the scoping guidelines. This factor is now included for most proposals where the cumulative ecosystem impact must be considered (Taylor, 2000). There is a need for the evaluation stage in EIA to consider the overall performance of a particular proposal, not just the constituent parts alone. A typical failure of EIA is the inability to analyse and assess cumulative environmental change arising from independent actions or events that may be individually insignificant (Spaling and Smit, 1993).

A second weakness is that the EPA risks placing too much emphasis on environmental factors that can be described in objective terms at the expense of more subjective and values-based aspects of the environment. Formerly the EPA provided much more general guidelines for the preparation of EIA documents. Proponents played a greater role in determining the scope of EIA studies and they were charged with the responsibility of demonstrating that their proposals could be managed to be environmentally acceptable (EPA, 1993, page 7). The EPA maintained a flexible and discretionary approach to the assessment of each proposal.

The current system places greater responsibility on the EPA for the environmental performance of proposals. While transparency in decision-making is generally recognised as a component of effective EIA, it is important that this does not come at the expense of the ability to maintain a flexible and discretionary approach to EIA evaluation and decision-making.

References

J Bailey (1997), "Environmental impact assessment and management: an under-explored relationship", *Environmental Management*, 21(3), pages 317–327.

J Bailey, D Annandale and S Jennings (1998), *Environmental Assessment Training for Consultants Training Manual August 1998: Training Initiative of the Department of Environmental Protection* (Division of Science, Murdoch University, Western Australia).

A Barker and C Wood (1999), "An evaluation of EIA system performance in eight EU countries", *Environmental Impact Assessment Review*, 19, pages 387–404.

R Bisset (1996), *Environmental Impact Assessment: Issues, Trends and Practice* (preliminary version, June, prepared for The United Nations Environment Programme, Scott Wilson Resource Consultants, UK) available online: (last accessed 20 March 2000).

B Bowen (1997), "Environmental management systems and environmental regulation", *Australian Environmental Law News*, 3, pages 21–25.

Canadian Environmental Assessment Agency and Environment Canada (1996), *Environmental Assessment in Canada: Achievements, Challenges and Directions: A Report in Support of the International Study of the Effectiveness of Environmental Assessment* (Minister of Supply and Services, Canada).

CEPA, Commonwealth Environmental Protection Agency (undated), *Public Review of the Commonwealth Environmental Impact Assessment Process: Initial Discussion Paper: Setting the Direction* (Commonwealth Environmental Protection Agency, Canberra, ACT).

EPA, Environmental Protection Authority (1993), *Environmental Protection Act 1986 Environmental Impact Assessment Administrative Procedures 1993* (Environmental Protection Authority, Western Australia).

EPA, Environmental Protection Authority (1999), *Stirling–Harvey Redevelopment Scheme Including Changes to Harris Dam Project: Water Corporation, Report and Recommendations of the Environmental Protection Authority* (Environmental Protection Authority, Perth, Western Australia).

N Harvey (1998), *Environmental Impact Assessment: Procedures, Practice and Prospects in Australia* (Oxford University Press, Melbourne).

Kinhill Engineers Pty Ltd (1994,) *Commonwealth Environment Protection Agency Public Participation in the Environmental Impact Assessment Process: Input to the Public Review of the Commonwealth Environmental Impact Assessment Process* (CEPA, Canberra, ACT).

N Lee, F Walsh and G Reeder (1994), "Assessing the performance of the EA process", *Project Appraisal*, 9(3), pages 161–172.

L Ortolano (1993), "Controls on project proponents and environmental impact assessment effectiveness", *The Environmental Professional*, 15, pages 352–363.

L Ortolano, B Jenkins and R P Abracosa (1987), "Speculations on when and why EIA is effective", *Environmental Impact Assessment Review*, 7, pages 285–292.

B Ridgway, M McCabe, J Bailey, R Saunders and B Sadler (1996) *Environmental Impact Assessment Training Resource Manual* (Prepared for the United Nations Environment Programme (UNEP) by Environment Australia (Environment Protection Group), Canberra, Australia) available online: http://www.environment.gov.au/epg/eianet/manual/manual/topic10.htm [last accessed 20/3/00].

B Sadler (1996), *International Study of the Effectiveness of Environmental Assessment, Final Report, Environmental Assessment in a Changing World: Evaluating Practice to Improve Performance* (Minister of Supply and Services, Canada).

R Sippe (1997), "Establishing rules for environmental acceptability for reviewing EAs: the Western Australian experience", *Environmental Assessment*, 5(1), pages 17–20.

R A D Sippe (1990), "Power and accountability: the contribution of environmental impact assessment to sustainable development in Western Australia", in *Science, Assessment and Sustainability Conference*, Vancouver, Canada, unpublished conference paper (International Association for Impact Assessment) page 7.

H Spaling and B Smit (1993), "Cumulative environmental change: conceptual frameworks, evaluation approaches, and institutional perspectives", *Environmental Management*, 17(5), pages 587–600.

K Taylor (2000), Department of Environmental Protection, personal communication, 19 April.

Welker Environmental Consultancy (1999), *Stirling–Harvey Redevelopment Scheme Public Environmental Review*, prepared for Water Corporation (Welker Environmental Consultancy, Western Australia).

C Wood (1994), "Lessons from comparative experience", *Built Environment*, 20(4), pages 332–344.

C Wood and J Bailey (1994), "Predominance and independence in environmental impact assessment: the Western Australian model", *Environmental Impact Assessment Review*, 14(1), pages 37–59.