



ENVIRONMENTAL OFFSETS



Preliminary

Position Statement No. 9



July 2004



Environmental Protection Authority

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FOREWORD

Environmental offsets aim to ensure that significant and unavoidable adverse environmental impacts are counterbalanced by a positive environmental gain, with a goal of achieving a 'net environmental benefit'. In light of the State's recent alignment with the sustainability philosophy, it has potential to be a useful management tool – enabling development to occur, but not at the total expense of the environment. It is important to recognize that environmental offsets represent a 'last line of defence' for the environment, only being used when all other options to avoid and mitigate environmental impacts have been exhausted.



This Preliminary Position Statement sets out the EPA's view on environmental offsets. The EPA considers that environmental offsets should be included, where appropriate, as part of approvals for environmentally acceptable projects to maintain and wherever possible enhance the State's environment. To this end, this position statement establishes a purpose, scope and principles for environmental offsets that the EPA will consider in future advice and recommendations. I anticipate that this Position Statement will provide the basis for developing a whole of government policy on environmental offsets.

This Position Statement has been termed Preliminary in that the EPA welcomes comments. Such comments should be made to the Chairman, Environmental Protection Authority, GPO Box K822, Perth 6842 WA by 8th September 2004.

A handwritten signature in dark ink, appearing to read 'W. Cox'.

Walter Cox
Chairman
Environmental Protection Authority
14 July 2004



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1. INTRODUCTION

In recent decades, there have been several attempts at developing and using environmental offsets as an environmental management tool in Western Australia (WA). For example, in the 1980s and 1990s government agencies attempted to counter adverse environmental impacts to Swan Coastal Plain wetlands by creating, conserving or enhancing wetlands elsewhere.

In more recent years the focus has evolved to using offsets in a broader environmental management context, that is for counterbalancing waste emissions and impacts to conservation reserves, native vegetation, wetlands, habitat and biodiversity. Sustainability has also recently become a key philosophy endorsed by the State and methods are being developed to help achieve this (Government of WA, 2003a). Environmental offsets are one tool being used in this context, providing alternative beneficial environmental outcomes in situations where social and economic growth is sought at some detriment to the environment.

The Environmental Protection Authority (EPA) currently recognises that various offset policies and approaches are being developed without common overarching principles and acknowledges that there is the potential for inconsistent messages to be given. In addition, there is some concern from the community about what offsets should and shouldn't be and, to date, there has been limited opportunity for them to provide comment.

The EPA is also concerned about perceptions that negotiated offset and compensation packages are being used to make otherwise 'unacceptable' adverse environmental impacts 'acceptable' within government. It is aware that some environmental offsets, proposed in the guise of sustainability tools, are sometimes over-riding the protection and conservation our State's most valuable environmental assets. Over time, the cumulative effects of this type of decision-making would contribute to a gradual decline in both the quality and quantity of the State's priority environmental assets. The EPA is of the view that this approach is neither sustainable nor focused on protecting the environment. It is also aware there may be equity issues that need to be addressed by government. The challenge now is to find the means of doing so effectively.

Previous EPA policy has provided the context for using environmental offsets in various applications. One approach currently being used for Environmental Impact Assessment (EIA) is the 'net conservation benefit' approach, having been developed by conservation agencies in collaboration with the EPA (EPA Bulletin 1101, 2003). This approach focuses on offsetting the clearing of conservation estate land with the addition of another area of suitable land into the conservation estate. This approach also extended to making contributions towards environmental research, management and other environmentally beneficial activities.

The EPA has also published a draft policy framework on wetland banking. This document was released for public comment in 2001 (EPA, 2001a). It proposed the development of a wetland credit-trading scheme, regulated through a 'bank', which would issue credits for wetland improvements and debits for wetland degradation. A summary of public comments on this document has been provided in Appendix 1. Many



of the issues identified in this document's public consultation phase were used in the development of this Position Statement.

General EPA offsets policy direction has also previously been provided for native vegetation and wetlands outside of the conservation estate (EPA, 2000; EPA, 2001b), marine benthic habitats where substantial cumulative losses have already occurred (EPA, 2003a) and in general circumstances where 'best practices' are considered inappropriate or inadequate (EPA, 2003b).

State Government agencies have also been developing various offset policies. The Department of Environment (DOE) is in the process of preparing a native vegetation offset scheme for clearing proposals through new regulations for the *Environmental Protection Act 1986*. In addition, the Department of Conservation and Land Management (CALM) has been developing a 'conservation offsets' policy with respect to offsetting adverse impacts to conservation reserves, State Forest, threatened flora, fauna and ecological communities. Public consultation is being undertaken on this policy approach as part of the proposed Biodiversity Conservation Act. The Department of Planning and Infrastructure (DPI) is developing an offsets and mitigation policy for impacts to 'Bush Forever' native vegetation sites, and a separate offsets policy for adverse environmental impacts associated with road construction.

In view of the afore-mentioned issues, the EPA is developing this Position Statement to provide overarching guidance and to establish a consistent policy approach on the matter. This position statement provides some clarification on the options for industry, developers, environmental consultants, specialist scientists and community groups who may be involved in developing or reviewing options for environmental offsets.

2. DEFINITIONS

Environmental offsets terminology can be confusing, with some terms often being used interchangeably in the literature and having different meanings. The EPA has provided the following definitions to provide clarity and consistency on this matter. These terms are used within the context of this Position Statement, and the EPA encourages the wider adoption of these terms and definitions.

Environmental Offset

Synonyms: “trade-offs”, “set-off”, “counterbalance”.

Environmental offsets are commonly referred to environmentally beneficial activities undertaken to counterbalance an adverse environmental impact, aspiring to achieve ‘no net environmental loss’ or a ‘net environmental benefit’ outcome. This Position Statement discusses two types of offsets:

Primary Offset

A primary environmental offset is any environmentally beneficial activity undertaken to counterbalance an adverse environmental impact or harm, with the goal of achieving ‘no net loss’ and preferably a ‘net environmental benefit’. Examples may include ameliorative actions including ecosystem restoration, rehabilitation or re-establishment activities or pollutant sequestration. It may also extend to forms of banking, credit trading and use of trust funds where adverse impacts can be offset through the purchase of environmental improvements elsewhere.

Secondary Offset

A secondary environmental offset is any environmentally beneficial activity undertaken to complement and enhance the primary offset activity. Secondary offset activities do *not* contribute to a ‘no net loss’ outcome, but instead adds materially to environmental knowledge, research, management, protection, etc.

The terms ‘primary’ and ‘secondary’ reflect a sequence of approach, rather than a ranking of importance.

Mitigation

Mitigation, in an environmental context, refers to a sequence of considerations designed to help manage adverse environmental impacts, which includes (in order of preference):

1. Avoidance – avoiding the adverse environmental impact all together;
2. Minimisation – limiting the degree or magnitude of the adverse impact;
3. Rectification – repairing, rehabilitating or restoring the impacted site as soon as possible;
4. Reduction – gradually eliminating the adverse impact over time by preservation and maintenance operations during the life of the action.; and,
5. Offsets – undertaking such activities (at a distance from the impact site) that counterbalance an adverse, residual environmental impact.

Adapted from EPA (2001a). A similar approach is used by US EPA (1990).

Banking

Banking, in an environmental context, refers to a system whereby credits are generated for undertaking environmental improvements (such as sequestration, restoration, rehabilitation and re-establishment activities). The credits can be later withdrawn (purchased) from the 'bank' to offset authorized adverse environmental impacts. The bank provides a centralized, cumulative record of credits (environmental improvements) and debits (adverse environmental impacts) within a standardized accounting framework and a goal of ensuring a neutral or positive balance.

'No net loss' concept

Synonyms: "zero net impact", "no net difference".

The 'no net loss' concept aims to ensure that environmental loss is balanced by an environmental gain, so that there is no overall significant environmental difference. It refers to no overall loss of the total extent, quality, ecological integrity and security of environmental assets and their values. The concept is subject to cumulative gains and losses within a specific area, region or project.

'Net benefit' concept

Synonyms: "net gain", 'net improvement'.

The 'net benefit' concept is an extension of the 'no net loss' concept and aims to ensure more environmental gains occur compared to environmental losses. It refers to an overall improvement in the total extent, quality, ecological integrity and security of environmental assets and their values. The concept is subject to cumulative gains and losses within a specific area, region or project.

3. BACKGROUND

Conservation of the environment is always desirable. However, in a growing society and economy this is not always achievable. Where environmental impacts must occur, environmental offsets represent the ‘last line of defence’ for the environment. They aim to ensure that any adverse impacts are counterbalanced by an environmental gain somewhere else, so there is no environmental difference as a result.

Historically, adverse environmental impacts were regarded as an acceptable consequence of economic and social growth. However, it is now well recognised this past thinking was unsustainable. As a consequence, the State is now dealing with significant environmental problems that threaten the condition of the State’s environment and also its social and economic integrity. For example, past clearing of native vegetation in the south west wheat belt has contributed to the current threat of land and water salinisation, which in turn, is contributing to loss of biodiversity, loss of potable water supplies, destabilization of rural communities and reduced primary agricultural production.

Sustainability tools are needed to ensure the protection and *improvement* of the environment whilst allowing for economic and social growth. Environmental offsets are one management tool that has the potential to help achieve sustainable outcomes, as identified in the State Sustainability Strategy (Government of Western Australia, 2003a). Other similar management tools include credit trading schemes and wetland / bushland banking.

Environmental offsets as a basic concept is well established nationally, having been incorporated into government policies for native vegetation, carbon trading and forestry. Western Australia is also a signatory to national agreements that employ the offset concept. Of particular significance is the National Objectives and Targets for Biodiversity Conservation (Environment Australia, 2001b) which aims to reduce the national net rate of land clearing to zero. The offsets concept has also been integrated into the National and State Greenhouse Strategies through vegetation carbon offsets and carbon credit trading schemes (Commonwealth of Australia, 1998; Government of Western Australia, 2003b); being similar in nature to schemes adopted internationally under the Kyoto Protocol.

Despite global strengthening of environmental policy and regulation, many key aspects of environmental health continue to degrade (Government of Western Australia, 1998; Commonwealth of Australia, 2001; UNEP, 2002). By itself, strict environmental policy and regulation can be a resource and time consuming activity for both regulators and proponents. However, by using environmental offsets as a complementary activity, it may allow a more flexible approach where some minor impacts may be considered if there is an overall net benefit for the environment. This approach may be particularly relevant where there is a minor environmental benefit to be gained by reducing emissions a small amount (beyond what can be achieved through best available technology) at a large cost to the proponent. In these circumstances, the proponent may use offsets to achieve a greater environmental benefit somewhere else at a much-reduced cost (NSW EPA, 2002). Notwithstanding the above, it is widely recognised that regulatory tools and enforcement still have a very important role to ensure the environment remains protected in the long term.

Emissions appear to be the clearest or easiest application for environmental offsets. This can be attributed, in part, to established methods for quantifying, comparing and assessing pollutants being discharged to the environment. Many case examples are available from around the world that show how emission offsets (in particular greenhouse gas emissions and nutrient emissions) can produce positive environmental outcomes, and in some instances, a truly sustainable outcome (for example, US EPA 2002, Climate Trust, World Resources Institute, 2000; EPA Bulletin 945).

In addition to their obvious connection with point source pollution, offsets may also prove to be a remedy for the management of diffuse pollutant sources that have historically proven to be a large and onerous task for government to manage alone. Diffuse pollution offsets may utilise the creation of plantations or re-establishment of ecosystems to act as diffuse pollutant (carbon and other nutrients) sinks (NSW EPA 2002; O'Sullivan, 2002).

Another potential benefit of offsets is their ability to utilise market forces in environmental protection. The incorporation of offsets into programs or schemes (such as wetland banking, credit trading or other market-based incentives) can allow the marketplace to become actively involved in environmental protection and enhancement. Companies can be formed with the sole purpose of generating environmental improvements (via ecosystem restoration, rehabilitation and re-establishment projects) knowing that these improvements can then be on-sold at market price to other companies wanting to offset environmental impacts. In this way, proactive environmental improvements can be undertaken before impacts occur. Integrating environmental protection into the marketplace represents a further step towards achieving sustainability and a great deal of research is currently being undertaken throughout Australia on this matter (James, 1997; Van Bueren, 2001; Murtough et al., 2002; Binning et al, 2002; Robinson and Ryan, 2002; Godden and Vernon, 2003; amongst others).

While environmental offsets can offer a sustainable approach to environmental protection, the concept is not without its limitations. Long-term studies of environmental offset schemes overseas have shown that implementing offset projects without sufficient data, research, information, available resources, regulation and commitment will only result in a *net loss* of environmental assets and values – the opposite desired effect of environmental offsets (Brown and Lant, 1999; Committee of Mitigating Wetland Losses, 2001; Ambrose, 2000; Johnson et al., 2002). This has been shown to be especially true for offsets related to natural ecosystems, especially wetlands and complex vegetation types. Therefore it is imperative to ensure that offset-related policies, programs and projects are robustly coordinated, monitored, managed, evaluated and enforced to ensure the environmental offset contributes to successful, long-term environmental outcomes.

In addition, there have been general concerns that the whole offsets concept adopts a 'reactive' approach. That is, offsets depend on an adverse environmental impact happening for an environmental improvement to occur. There have also been suggestions that some offset programs in other Australian States have been too narrowly focussed and failed to address broader ecosystem benefits of the impacted ecosystem (Gillespie, 2000; NCC of NSW, 2001; Environment Victoria, 2000).

Offsets may also be perceived as suggesting that all environmental assets are 'up for grabs'. This perception highlights an important point. There must be clear and



unambiguous delineation about the role and use of offsets as an environmental impact management tool, and *not* as a project negotiation tool. It emphasises the need to reaffirm the mitigation sequence for environmental impact management and to reaffirm the conservation and protection of ‘critical assets’ that represent our State’s most important environmental assets.

The apparent limitations of environmental offsets highlight the need for the EPA to establish strong principles based on a foundation of environmental protection. It also highlights the need for the State to reaffirm its position on ‘critical assets’ – to provide a scope for the intended use of environmental offsets. It must also be reinforced that offsets are only one tool in the suite of environmental management instruments and that they must be used in conjunction with proactive tools (such as use of best practices and incentives), so as to promote the conservation of the environment first and foremost.

4. PURPOSE

The purpose of this Position Statement is to provide the community, government agencies, industry, developers, consultants, business and other key stakeholders with overarching advice about the intent and appropriate use of environmental offsets.

The EPA considers the purpose, scope and principles in this Position Statement to be important and these will help guide the EPA in future decision-making and in its advice. It must also be reinforced that the EPA's environmental offsets policy position in no way affects the legitimacy of other policy positions related to conservation and environmental protection. The EPA holds the view that environmental offsets should not be considered in isolation, but rather as part of an integrated framework for improved management of the environment that includes regulatory and behavioral incentive programs.

NET ENVIRONMENTAL BENEFIT GOAL

The EPA is of the opinion that environmental offsets should be used with an aspiration of achieving a '*net environmental benefit*'. This policy position recognizes that the environment has been significantly compromised in the past and that halting and *reversing* the decline of the environment is now a priority (Figure 1).

Achieving a '*net environmental benefit*' goal means that each offset proposal should address primary offsets to help counterbalance environmental impacts, plus secondary offsets (as necessary) to complement the primary offset activity in meeting the offset principles.

NET ENVIRONMENTAL BENEFIT = PRIMARY OFFSET + SECONDARY OFFSET(S)

Where-

Primary offsets = at least one activity should be selected to help counterbalance the environmental impact, with the aim of achieving no environmental difference; eg. restoration; rehabilitation; re-establishment; sequestration; or contributions to an approved 'bank', credit trading scheme or trust fund (as deemed appropriate by the EPA).

Secondary offsets = select complementary activities (as necessary) to help the primary offset meet the offset principles (see Section 6); eg. acquiring land for conservation; protection mechanisms; management; education; research; removal of threats; or other activities having a proven environmental benefit.

In accordance with the scope and principles of this Position Statement.

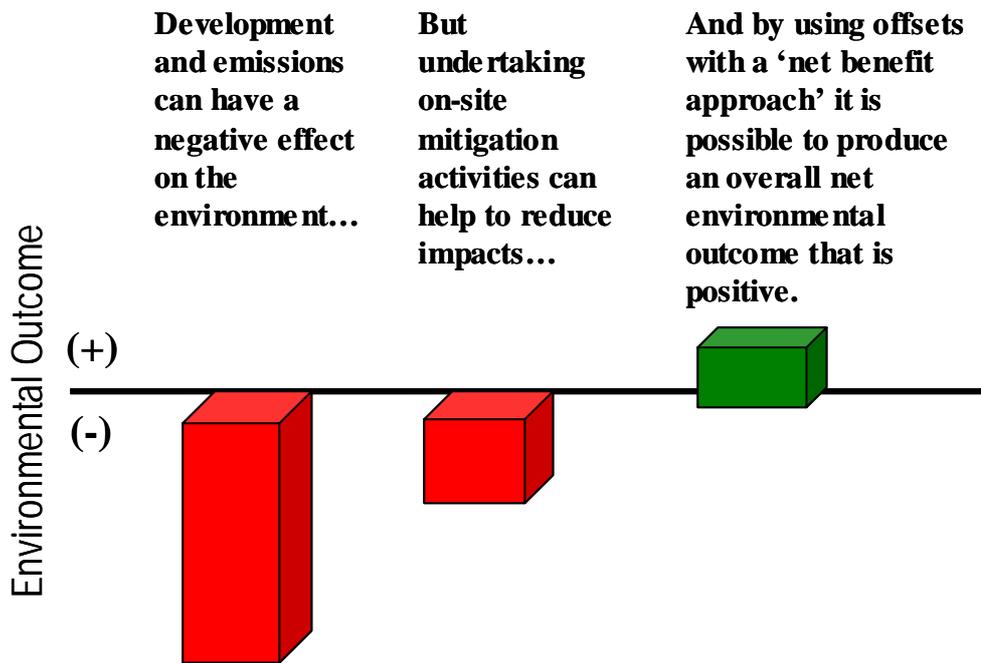


Figure 1: The purpose of a 'net environmental benefit' goal is to achieve a positive environmental outcome from new development or emissions. Adapted from NSW EPA (2002).

5. SCOPE

The scope of this Position Statement applies to all environmental issues, matters and advice for which the EPA has jurisdiction.

Ecosystems and Emissions

This Position Statement is relevant to all new proposals for significant adverse impacts to ecosystems and for emissions to the environment.

Environmental offsets should only be considered where on-site impact mitigation has been reasonably considered or demonstrated, and where residual adverse impacts are considered significant - but not significant enough to make the project unacceptable.

The EPA on the advice of relevant environmental government agencies will determine whether adverse residual impacts are significant or not.

The EPA encourages industry, developers, consultants, specialist scientists and community groups to consider options for environmental offsets in the early phases of a proposed project and in consultation with the wider community.

Critical Assets

‘Critical assets’ represent the most important environmental assets in the State that must be fully protected and conserved for:

- the State to fulfill its statutory and policy requirements;
- the State to remain sustainable in the longer term; and,
- the EPA to comply with its general principles for advice and decision making (see Section 6 on Principles).

Therefore, when the issue is before the EPA, it is unlikely to approve project proposals that have significant adverse impacts to ‘critical assets’. With the exception of “*special circumstances*” arising (see below), the EPA does not consider it appropriate to validate or endorse the use of environmental offsets where projects will have significant adverse impacts to the following:

i) Public Conservation Reserve System

- Nature reserves, national parks, conservation parks, regional parks, marine parks, marine nature reserves and marine management areas.
[in accordance with Conservation and Land Management Act 1984 and Land Administration Act 1997]

ii) Native Vegetation

- Where adverse impacts to native vegetation is at serious variance to the principles listed under Schedule 5 of the amended *Environmental Protection Act (1986)* where, “Native vegetation should not be cleared if -

- a) It comprises a high level of biological diversity;
 - b) It comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia;
 - c) It includes, or is necessary for the continued existence of, rare flora;
 - d) It comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community;
 - e) It is significant as a remnant of native vegetation in an area that has been extensively cleared;
 - f) It is growing in, or in association with, an environment associated with a watercourse or wetland;
 - g) The clearing of the vegetation is likely to cause appreciable land degradation;
 - h) The clearing of the vegetation is likely to have an impact of the environmental values of any adjacent or nearby conservation area;
 - i) The clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water;
 - j) The clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”
- Where adverse impacts to a native vegetation complex would result in a 30% or less representation of the pre-clearing extent of that vegetation complex in a bioregion. [National Objectives and Targets for Biodiversity Conservation 2001-2005, EPA Position Statement 2]
 - Where adverse impacts to a native vegetation complex in constrained areas on the Swan Coastal Plain would result in a 10% or less representation of the pre-clearing extent of that native vegetation complex. [Bush Forever2000; Greater Bunbury Region Scheme]
 - Gazetted Bush Forever sites. [Bush Forever2000]

[in accordance with Environmental Protection Act 1986,]

iii) Biodiversity

- Declared Rare Flora (DRF) - that significantly impacts local populations. [listed pursuant to Wildlife Conservation Act 1950]
- Declared Threatened Fauna - that significantly impacts local populations. [listed pursuant to Wildlife Conservation Act 1950]
- Having regard for Threatened Ecological Communities (TEC) - which fits in any of the following categories: presumed totally destroyed, critically endangered, endangered, vulnerable or data deficient. [as defined by English and Blyth, 1999, and identified by Department of Conservation and Land Management]
- Having regard for the Priority Species List [as identified by Department of Conservation and Land Management]

[in accordance with Environmental Protection Act 1986, Conservation and Land Management Act 1984, and with EPA Position Statements 2 and 3]

iv) Wetlands

- Ramsar Wetland.
- A wetland listed in the '*A Directory of Important Wetlands in Australia*', 3rd edition. [Environment Australia, 2001a]
- Environmental Protection Policy (EPP) wetlands.
- Conservation Category Wetlands (CCW).
[as identified by Department of Environment and Department of Conservation and Land Management]

[in accordance with Environmental Protection Act 1986, Conservation and Land Management Act 1984 and with EPA Preliminary Position Statement 4]

v) Rivers

- Wild and Scenic Rivers.
[as identified by Australian Heritage Commission and Department of Environment]

vi) Landscape

- Where an important landscape, feature or environmental icon will be irreversibly impacted or destroyed.
[as accepted by the Environmental Protection Authority]

vii) Emissions / Discharges

- In areas where new or an addition to existing emissions present a significant risk to human health or the environment.
- In areas where new or an addition to existing emissions exceed a prescribed environmental or health standard.

[in accordance with Environmental Protection Act 1986, Health Act 1911]

viii) Threats

- Where the introduction of a key threatening organism, process or activity threatens, or has potential to threaten, the survival, abundance or evolutionary development of a native species or ecological community as identified for 'biodiversity critical assets'.

ix) Heritage

- Places of State, National or World Heritage significance.

[as identified by the *Environment Protection and Biodiversity Conservation Act 1999 (Cwth)*,
Heritage of Western Australia Act, 1990]

- Places of Indigenous Heritage importance.
[as defined by *Aboriginal Heritage Act 1972*].

x) **Other**

- Other priority environmental assets with important environmental values as accepted by the Environmental Protection Authority.
[in accordance with *Environmental Protection Act 1986*]

Special Circumstances

In some instances, significant adverse impacts to ‘critical assets’ may be approved by the State Government to provide an essential community service (such as electricity, water, gas and transport infrastructure), or to allow strategic social or economic development to occur.

Any approved project of this nature should be made conditional on the:

- Consideration or demonstration (to the maximum extent possible) of on-site impact mitigation; and the,
- Development and implementation of an acceptable off-site offsets package for significant, residual adverse impacts.

6. PRINCIPLES

In its advice and decision making the EPA considers a number of generic environmental principles from the *Environmental Protection Act (1986)*, including:

- The precautionary principle
- The principle of intergenerational equity
- The principle of the conservation of biological diversity and ecological integrity
- Principles relating to improved valuation, pricing and incentive mechanisms; and
- The principle of waste minimisation

With reference to environmental offsets, the policies, decisions and advice of the EPA will be guided by the following principles, in accordance with the purpose and scope:

A. Environmental offsets should only be considered after all other attempts to mitigate adverse impacts have been exhausted.

- On-site adverse environmental impacts must first be addressed using the mitigation sequence (ie. avoidance, minimise, rectify, reduce, offset in that order – refer Figure 2). Protection and conservation of existing environmental assets will always remain a priority above the use of environmental offsets. Off-site offsets are then used to address any significant residual environmental impacts following mitigation considerations.
- Proponents wanting to undertake environmental offsets must provide a statement of reasoning to explain what mitigation will occur and why other mitigation options have not been selected. This demonstrates that the ‘impact mitigation sequence’ has been fully considered and provides justification for the environmental offset to occur.

B. An environmental offset package should address both primary offsets and secondary offsets.

- Primary offsets directly counterbalance the adverse environmental impact, with the aim of achieving no environmental difference (ie. no net loss). An understanding of an appropriate primary offset activity will require research, investigations and a debate of findings with key stakeholders.
 - When relevant to ecosystems, primary offset options may include restoration or rehabilitation of existing degraded ecosystems, or re-establishing desirable ecosystems (eg. re-establishing biodiversity corridors or specific ecosystems in areas of low representation).
 - When relevant to emissions, primary offsets include sequestration activities that permanently remove or ‘lock up’ a pollutant from the environment (such as establishing new ecosystems, deep well injection and capping, or removing or capturing pollutants from the environment via other approved methods).

- Where a proponent is unable to undertake restoration, rehabilitation, re-establishment or sequestration activities, they may consider the use of ‘banking’ or ‘credit-trading schemes’ to purchase equivalent environmental credits (improvements) to offset their adverse environmental impacts. Alternatively, an appropriate financial amount should be contributed to a statutory trust fund with the sole purpose of being used for an environmental improvement activity.
- Secondary offset activities should not be considered until *after* a primary offset activity has been addressed.
- Secondary offsets should complement and assist the primary offset activity to meet the purpose and principles in this Position Statement.
 - When relevant to ecosystems, secondary offset options may include conservation activities (such as land acquisition and covenanting or transfer into the conservation estate), protection (such as fencing, buffering, or bunding), new research, education, removing threats, or on-going management activities (such as monitoring, maintenance, preparing management plans, evaluation, reporting, etc).
 - When relevant to emissions, secondary offsets may include enhancing current best practices and technologies, assisting other industries with resource-efficient practices, new research, education or on-going management activities.
- Successful integration and application of a primary offset activity and appropriate secondary offset activities should aim to produce a ‘net environmental benefit’ outcome.

C. Environmental offset and impact should ideally be ‘like for like or better’.

- ‘Like for like’ ensures that the offset activity counterbalances the same type of impacted ecosystem or emission.
 - When relevant to ecosystems, ‘like for like’ applies to environmental values, vegetation, habitat, species, ecosystem, landscape, hydrology, and physical area. The principle prevents similar threatened ecosystems, flora and fauna species from being systematically degraded over time. Ideally the receiving offset site should be located in the same local vicinity, so as to ensure the offset effect is expressed within the same area of impact. This ensures that offsets are not diluted or concentrated within a specific geographical area or bioregion.
 - When relevant to emissions, ‘like for like’ applies to both the chemical and quantity of emissions. The chemical being offset should be the same as the chemical being emitted. For example, phosphate waste discharge should be offset with phosphate sequestration methods. It is worth noting that offsets should not extend to chemicals that are hazardous to the environment or human health (ie. toxic or synthetic chemicals such as

plastics, pesticides, heavy metals, etc). With reference to quantity of emissions, 'like for like' refers to sequestering the equivalent mass or volume of the chemical that is being discharged to the environment.

- 'Like for better' refers to making improvements beyond what is required for 'like for like'. This may refer to either an enhancement in either the quality or quantity aspects of the offset activity while still considering 'like for like' requirements.
 - Where relevant to ecosystems, 'like for better' may consist of a transfer of offset resources from a lower value asset to a higher value asset in order to achieve an improved environmental outcome.
 - Where relevant to emissions, 'like for better' may consist of a greater amount of pollutant being sequestered than what is required under 'like for like' and 'offset ratio' requirements (see Principle D). 'Like for better' may also refer to achieving ecosystem improvements *at the same time* as achieving emission offsets. For example, re-establishment of a desirable ecosystem would meet offset requirements for both emissions *and* ecosystems. However, establishing a plantation or nutrient-stripping pond would meet only emission offset requirements.
- Where 'like for like or better' principles can not be achieved due to limited availability of similar ecosystems in the local vicinity, it must be ascertained if the ecosystem to be impacted is unique to the bioregion. This may require relevant government environmental agencies to reassess whether this particular ecosystem type is a 'critical asset'. Under this scenario, other more suitable offset sites may be recommended to the proponent by the relevant environmental agencies.

D. Positive environmental offset ratios should apply where risk of failure is apparent.

- Positive offset ratios should be used where 'critical assets' are adversely impacted, or where there is a risk that the offset will not succeed over the long term. That is, the size of the offset to impact ratio should be larger than 1:1 and be *proportional* to both the importance of the environmental asset being impacted, and the likelihood that the offset is unlikely to achieve a 'net environmental benefit' outcome. Offset ratios should be based on past findings, success rates, current research or other similar projects being undertaken.
 - When relevant to ecosystems, offset ratios should apply to environmental values, vegetation, habitat, species, ecosystem, landscape, and hydrology, in addition to physical area. The principle prevents complex ecosystems or unique species (that are difficult to restore, rehabilitate or reestablish) from being systematically degraded over time.
 - When relevant to emissions, offset ratios should apply to the quantity of the pollutant being discharged. The ratio should consider if pollutant emissions or offset outcomes (ie. sequestration or net uptake) are expected to fluctuate significantly over time. Ratios should be weighted to

accommodate periods of higher-than-expected emissions, or where an offset activity's sequestration rate is likely to deteriorate over time.

E. Environmental offsets must entail a robust and consistent assessment process.

- A robust and consistent assessment process will help to ensure that environmental offsets provide an equitable environmental outcome.
- Proponents causing significant adverse environmental impacts must demonstrate adequate knowledge of the environmental values of the impact site and the proposed offset site(s). After acquiring this adequate knowledge, proponents must demonstrate how their proposed offset package will result in a 'net environmental benefit' outcome. If adequate information is lacking in any of these areas, the project proposal will be considered in the context of the 'precautionary principle'.
- Assessments of both the impact and offset sites should include factors that are commonly identified through the Environmental Impact Assessment process.
- The EPA expects that those involved in the impact assessment or development of environmental offset proposals should have appropriate qualifications and experience to ensure reasonable standards are maintained.

F. Environmental offsets must meet all statutory requirements.

- Environmental offsets must meet all planning, statutory and regulatory requirements prior to further consideration.
- Negotiation of offset conditions should not be used to approve projects where they have been previously restricted by the abovementioned requirements.

G. Environmental offsets must be clearly defined, transparent and enforceable.

- Offsets must clearly define the environmental impact(s) it is intended for. Should the project be modified and cause further additional impacts beyond the original impact, this will require the project to be reassessed for additional environmental offsets.
- Actual offset activities being undertaken should be well documented by the proponent. Environmental offsets must be based on open and accountable administration. The general public should be able to see that offset principles have been put into practice and that offset goals are being achieved.
- Offset activities must always be enforceable through compliance auditing and enforcement activities and penalties issued when breaches are apparent.

H. Environmental offset must ensure a long lasting benefit.

- Environmental offsets must be undertaken on the understanding that the activities and outcomes must be long-term. Offset projects should demonstrate security of purpose, security of tenure and security of management.
 - When relevant to ecosystems, the offset site should be legally protected with covenants or conservation agreements or transferred into the conservation estate to ensure that the positive environmental benefit is long lasting. Legal agreements may be required in some instances to ensure the on-going management and maintenance of the offset site over an ecologically meaningful timeframe (10-30 years plus).
 - When relevant to emissions, the offset activity should last for *at least* the duration of the emissions or environmental impact (whichever occurs for the longer duration). Legal agreements may be required to secure on-going management and maintenance over this timeframe.
 - Where environmental improvements are purchased from a 'bank', credit trading scheme, or contributions made to an appropriate trust fund, it must be clearly demonstrated that the organization responsible for undertaking the environmental improvement activity is also demonstrating security of tenure and management.

7. IMPLEMENTATION

The purpose, scope and principles outlined in this Position Statement provide overarching guidance and direction on the issue from the EPA's perspective. Government agencies, local authorities, and relevant business and industry groups are encouraged to develop environmental offset policies and implementation guidelines that are consistent with this Position Statement.

DECISION-MAKING PROCESS

Figure 2 provides a summary of the decision-making process for using environmental offsets. Key features of the flowchart are outlined as follows.

First triangle: Environmental Assets

The following environmental asset types affect how project proposals and related offset activities are assessed.

- Critical Assets: represent the State's most important environmental assets that must be fully protected and conserved (as defined in Section 5). Significant adverse impacts to these assets should be avoided at all costs. Therefore, the EPA in providing its advice is unlikely to recommend approval of project proposals where significant adverse impacts affect 'critical assets'. However, in 'special circumstances', where projects have been approved by the State Government (see Section 5) they should be made conditional on the:
 - Consideration or demonstration (to the maximum extent possible) of on-site impact mitigation; and the,
 - Development and implementation of an acceptable off-site offsets package for significant, residual adverse impacts.

In these 'special circumstances', the project proponent should develop an environmental offset package using advice from relevant environmental government agencies and applying the principles identified in this Position Statement. The EPA will subsequently consider and make recommendations for the offset package as necessary to comply with this Position Statement.

- High Value Assets: represents those environmental assets that are in good to excellent condition, are considered valuable by the community and / or government, but are not identified as 'critical assets'. Project proposals and offset activities for these assets may be referred to and assessed by the EPA on a case-by-case basis, but are otherwise assessed by relevant environmental government agencies.
- Low to Medium Value Assets: represents those assets that are somewhat degraded as recognised by government agencies and / or community. Offset activities do not need to be referred to the EPA and will be assessed by relevant environmental government agencies.

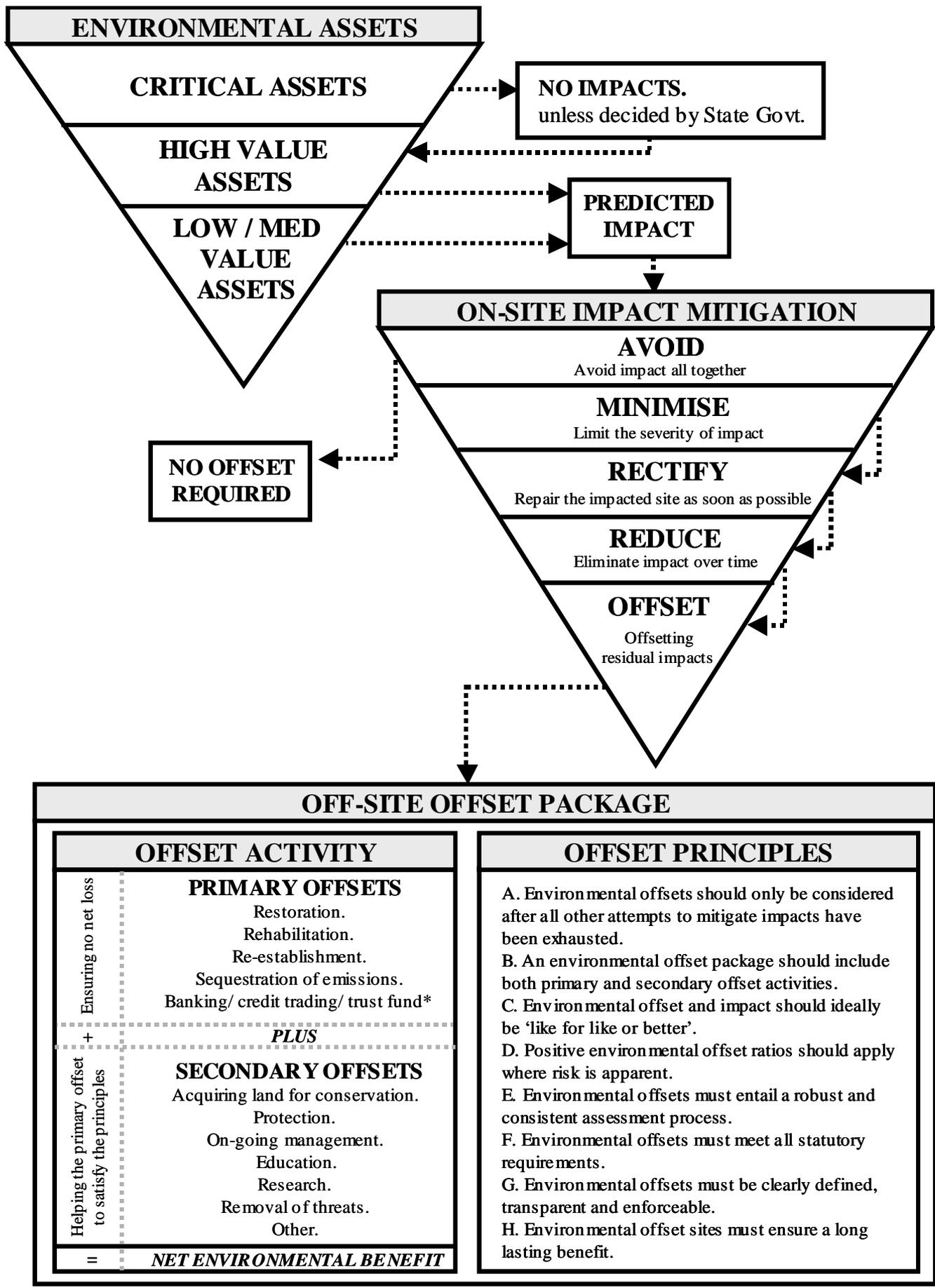


Figure 2: Decision framework for the use of environmental offsets (* as qualified in text)

Second triangle: On-site Impact Mitigation

These five steps represent the sequence of considerations designed to help manage on-site environmental adverse impacts (in order of preference).

- Avoidance: significant adverse impacts to the environment are avoided through selection of a practicable alternative. If *all* environmental impacts are avoided then no offset activities are required.
- Minimisation: if adverse impacts are not avoidable, all appropriate and practicable steps should be taken to minimise adverse impacts.
- Rectification: where adverse impacts can't be minimised, all appropriate and practicable steps should be taken to repair, rehabilitate or restore the impacted site as soon as possible.
- Reduction: where adverse impacts can not be rectified as soon as possible, all appropriate and practicable steps should be taken to reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action.
- Offsets: where significant residual adverse environmental impacts are still apparent after following the above mitigation sequence, then an environmental offset package may be used to achieve a 'net environmental benefit' outcome.

Box: Offsite Offset Package

An environmental offset package may be considered where adverse residual environmental impacts are significant, but not significant enough to make the project unacceptable.

To achieve a 'net environmental benefit' goal, the environmental offset package should address both primary offsets and secondary offsets.

Various types of offset activities are clarified as follows.

- Primary Offsets: these ameliorative actions occur at some distance to the impact site and are designed to counterbalance the adverse environmental impact, with the aim of achieving no environmental difference (ie. no net loss). As a minimum, one primary offset activity should be selected from the following list of activities:
 - Restoration: has the goal of improving an existing ecosystem to near pre-impact condition. This includes restoring natural or historic functions, appearance and other characteristics. Restoration of existing ecosystems is a highly desirable offset because it results in a fully functioning ecosystem. It is also more likely to succeed given existing hydrology and soils are conducive to maintenance of ecosystem functions.

- Enhancement / Rehabilitation: has the goal of increasing some of the functions of an existing high value, but damaged, ecosystem. Examples may include increasing native vegetation, enhancing habitat value, weed or feral fauna eradication, and / or establishing buffers. Rehabilitation of an existing ecosystem to produce an environmental benefit must outweigh the loss of the impacted ecosystem. When used as a sole primary offset activity, it may require the enhancement of several ecosystems or a much larger area than that lost from the impact.
- Re-establishment: has the goal of re-establishing a desirable ecosystem with strategic environmental benefit. While restoration and enhancement of existing ecosystems is preferred, re-establishment of past ecosystems may be beneficial in some instances. For example, forming a biodiversity corridor between two important ecosystems, or re-establishing ecosystems in areas of low representation.
- Sequestration: specific to offsetting pollutant emissions, it has the goal of permanently removing or 'locking up' pollutants in the environment. This may include activities associated with restoration, rehabilitation or re-establishment, or the use of banking or credit trading mechanisms, deep well injection and capping, or using other sequestration methods.
- Banking, Credit Trading or Trust Fund: where a proponent is unable to undertake restoration, rehabilitation, re-establishment or sequestration activities, they may consider the use of approved 'banks' or 'credit-trading schemes' to purchase environmental credits (improvements) to offset their adverse environmental impacts. Alternatively, an appropriate financial amount should be contributed to a statutory trust fund with the sole purpose of being used for a strategic environmental improvement activity. Unless banks, credit trading schemes, and trust funds are already in operation, contributions to these types of schemes will require methodologies to be developed that fully (financially) cost the adverse impacts to environmental assets, values and ecosystem services. These methodologies may take time to develop and will require endorsement by the EPA.
- Secondary Offsets: these environmental beneficial activities *do not* contribute towards the 'no net loss' goal. Instead, secondary offsets are used to complement and enhance the primary offset - helping it to meet the principles identified in this Position Statement (Section 6). They should only be considered once the primary offset has been addressed. Secondary offset activities should be selected as necessary to meet the principles of this Position Statement. These activities may include:
 - Acquiring Land for Conservation: consists of purchasing the primary offset site with the intent of transferring the land title into the conservation estate. Alternatively, establishing covenants with an approved organisation or establishing legal tenure agreements are other related activities. Land acquisition for conservation is not considered a primary offset, as it does not prevent the *net* loss of environmental assets. However, it has proven to be a valuable offset measure because it offers security of tenure, purpose

and management for the long term. Recent amendments to the *Environmental Protection Act (1986)* have also provided an enhanced level of protection for environmental assets outside the conservation estate through environmental harm provisions.

In some situations where adverse impacts to low, medium or high value environmental assets occurs, the environmental benefits of acquiring a 'critical asset' for conservation may greatly outweigh the overall environmental loss - in which case conservation through a combination of land acquisition, protection and on-going management may be considered a viable offsets package. It must be noted that this exception does *not* extend to adverse impacts to 'critical assets' (ie. adverse impacts to one 'critical asset' should not be offset by conservation of another 'critical asset').

- Protection: protecting the environment from threats or harm is achieved by using barriers or buffers, thereby reducing the risk of damage to, or pollution of, the offset site. Examples may include fencing of valuable ecosystems or installing chemical, biological, or physical barriers to minimize risk of future potential environmental impacts.
- Removal of threats: undertaking initiatives that remove a threat(s) from the primary offset site thereby preventing it from being potentially damaged in the future. Examples might include eradication of feral animals or exotic flora, removing pollutants, removing livestock, controlling the spread of diseases such as 'dieback', etc.
- Management: management of ecosystems is achieved by undertaking day-to-day activities that benefit the primary offset site. Examples may include developing an environmental management plan, managing on-going threats, or undertaking routine monitoring, reporting and evaluation for the primary offset site.
- Education: sustained education of community, business and industry about environmental issues related to the primary offset site or activity, or educating other industries or businesses of best practices to remedy poor environmental practices or behaviours.
- Research: investigating new technologies or innovative ideas to better address environmental issues or improve best practice associated with the primary offset activity. This also includes the necessary investigative work required for environmental assessments of impact and offset sites where current data or information is lacking.
- Other: the EPA encourages the development of innovative approaches aimed at improving environmental outcomes.

HYPOTHETICAL OFFSET CASE EXAMPLES

Example A: Wetland offset package

Despite best attempts to conserve a ‘conservation category wetland’, approval is given for it to be cleared for strategic development. The proponent has documented all attempts at on-site impact mitigation, but is unable to mitigate all significant adverse impacts. The developer proposes an offset package of finding a wetland in the local vicinity that has similar wetland characteristics and values as the wetland that will be impacted. After an extensive assessment process, working in collaboration with environmental government agencies, a suitable offsite wetland is found. The selected offsite wetland is in good condition; although it is showing some signs of degradation from the invasion of aquatic and terrestrial weeds, the presence of feral foxes, and the loss of under-story species in surrounding fringing vegetation. The proposed offset activities include a combination of wetland rehabilitation and restoration works (primary offset), and a large cleared area on the wetland boundary will be replanted with local endemic species to provide an additional buffer area (primary offset). The proponent will ensure the removal of weeds and feral fox threats, and allocate funds for on-going management and evaluation (secondary offsets). The whole wetland area will then be fenced from adjoining recreational space (secondary offset). The land will be purchased and placed into the conservation estate for long-term security (secondary offset). The developers will erect signage at the offset site and post quarterly updates and photos of their offset’s progress on their Internet site to show the community the progress of their offset wetland (secondary offset). The combination of the proponent’s primary and secondary offset activities will contribute to a ‘net environmental benefit’ outcome.

Example B: Nutrient offset package

A large horticultural business wishes to expand operations and increase nutrient waste discharge emissions to the nearby creek. Despite the company consistently demonstrating the use of best practice / technology, they are unable to mitigate any further discharges without a huge additional cost. The company proposes a nutrient offset package. After a robust assessment, with guidance from relevant authorities, an appropriate number of nitrogen (N), phosphorus (P) and carbon (C) units are calculated. The company agrees to offset these units by the purchasing and covenanting of a mature, re-established bushland area (primary offset) from an environmental credit-trading company (doing this meets the C, N and P offset requirements and has a bonus ecosystem offset). In addition, the company also commits to undertaking a collaborative research project with a local university looking at innovative ways for the business to further reduce their nutrient waste emissions (secondary offset). The results of the research would be made publicly available on completion of the project. The combination of the proponent’s primary and secondary offset activities will contribute to a ‘net environmental benefit’ outcome.

- although these hypothetical case examples do not provide quantitative details that will be necessary to develop an actual offset activity, the examples still provide an indication of how environmental offsets can be developed to meet the requirements of this Position Statement.

POLICY APPROACHES FOR IMPLEMENTATION

The EPA recognises that, for this environmental offsets approach to be implemented successfully, it must work in partnership with, and have the support of, government agencies. The EPA will use Part II, Section 17(3)(d) of the EP Act (1986) to implement the environmental offsets approach as outlined in this Position Statement. This part of the Act empowers the EPA to coordinate the development of non-coercive Government policy positions on particular aspects of the environment as follows:

s.17(3) ...the Authority, if it considers it appropriate or is requested to do so by the Minister, may -

(d) consider and make proposals as to the policy to be followed in the State with regard to environmental matters.

This tool would allow a statewide environmental policy to be developed for environmental offsets. The EPA would develop the first stages of this policy as advice to the Minister for the Environment. State Government could then adopt the policy as whole-of-government policy. Such policies can provide definitive, whole-of-Government direction to government agencies, industry and community within existing statutory and regulatory frameworks. This is advantageous for dealing with major environmental issues that cross regional, sectoral and jurisdictional boundaries, as commonly occurs with issues associated with environmental offsets. It is useful for State Government to adopt such a policy approach to ensure a consistent and unified system towards addressing environmental offsets.

8. GLOSSARY

Banking: in an environmental context, refers to a system whereby credits are generated for undertaking ecosystem restoration or rehabilitation, or for the re-establishment of desirable ecosystems. The credits can later be withdrawn from the bank to offset authorized environmental impacts. The 'bank' provides a centralized, cumulative record of credits (environmental improvements) and debits (environmental impacts), with a goal of ensuring a neutral or positive balance. (see EPA, 2001a)

Biodiversity: the variety of life forms, the different plants, animals and micro-organisms, the genes they contain and the ecosystems they form. Biodiversity, or biological diversity, is usually considered at three levels: genetic diversity, species diversity and ecosystem diversity (Commonwealth of Australia, 1996).

Bioregion: represents an area with common ecological characteristics, including climate, geomorphology, landforms, lithology and characteristic flora and fauna.

Conservation: the positive, embracing, preservation, maintenance, sustainable utilisation, restoration and enhancement of the natural environment.

Covenant: is a voluntary, flexible agreement between a landholder and a recognised body to protect natural assets. It is attached to the landholder's land title and, if permanent, can prevent future owners from clearing or damaging natural assets on that land.

Credit trading: a market-based process of buying and selling credits (environmental improvements) and debits (environmental impacts).

Critical assets: represents the most important environmental assets in the State that must be fully protected and conserved for the State to meet its statutory requirements and to remain sustainable in the longer term.

Ecosystem: a defined community of organisms, their interactions, and their physical surroundings.

Environmental impact: represents an effect on the environment that leads to changes in its condition. Depending on the nature of the activity causing the impact, it may have either beneficial or adverse environmental outcomes.

Environmental harm: means direct or indirect harm resulting from the removal or damage to native flora or fauna, habitat, or environmental values. (see *Environmental Protection Act 1986*)

Environmental offsets: are any environmentally beneficial activities undertaken to counterbalance an environmental impact or harm, with the aim of achieving a 'no net environmental loss' or 'net environmental benefit' outcome.

Environmental value: are particular values or uses of the environment that are important for a healthy ecosystem or for public benefit, welfare, safety or health and which requires

protection from the effects of pollution and harm. (ANZECC and ARMCANZ, 2000; see *Environmental Protection Act 1986*)

Incentives: something that induces or encourages people to act on a particular matter.

Intergenerational equity: the principle that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (Commonwealth of Australia, 1992).

Mitigation: refers to a sequence of considerations designed to help manage environmental impacts, which includes (in order of preference) avoid, minimise, rectify, reduce and offset. The concept originated from a Memorandum of Agreement between the US EPA derived from a Department of the Army - Environmental Protection Agency 1990 on Mitigation.

Net environmental benefit: where overall environmental gains are greater compared to environmental losses. The concept is an extension of the 'no net loss' concept.

No net loss: where environmental loss is balanced by environmental gains, so there is no overall environmental difference. It refers to no overall loss of the total extent, quality, ecological integrity and security of environmental assets and their values. The concept originated in the United States in the late 1980s and has since been adopted (in various manifestations) throughout the world.

Offsets: see environmental offsets

Precautionary principle: where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

- i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
- ii) an assessment of the risk-weighted consequences of various options.

(Intergovernmental Agreement on the Environment, 1992 (Cwth); Government of Western Australia, 2003).

Sustainability: is meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity. (Government of Western Australia, 2003)

Wetland banking: see "banking"

9. BIBLIOGRAPHY

Ambrose (2000). "Wetland Mitigation in the United States : assessing the success of mitigation policies". *Wetlands (Australia)*, **19** (1): 1-27.

Australian National Audit Office (ANAO) (1997-98). "*Program Evaluation in the Australian Public Service*", Report No.3, Canberra, 29 September.

Australian and New Zealand Environment and Conservation Council (ANZECC) (1999). National Framework for the Management and Monitoring of Australia's Native Vegetation, Department of Environment and Heritage, Canberra.

ANZECC and ARMCANZ (2000). National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Canberra, Australian Capital Territory.

Binning, C., Baker, B., Meharg, S., Cork, S. and Kearns, A. (2002) "*Making farm forestry pay – markets for ecosystem services*", Rural Industries Research and Development Corporation, Publication No 02/005, Canberra, January 2002.

Brown, P and Lant, C (1999). "The effect of wetland mitigation banking on the achievement of no-net-loss". *Environmental Management*, **23** (3): 333-345.

Climate Trust Organisation : news releases: *internet reference*:
<http://www.climatetrust.org/CTNewsReleases.html#Anchor-58259>

Committee on Mitigating Wetland Losses (2001). "*Compensating for Wetland Losses Under the Clean Water Act*", National Academy Press, Washington D.C. Internet referenced publication: <http://www.nap.edu/books/0309074320/html/index.html>

Commonwealth of Australia (1996). National Strategy for the Conservation of Australia's Biological Diversity, AGPS, Canberra.

Commonwealth of Australia (1998). The National Greenhouse Strategy, Australian Greenhouse Office, Canberra.

Commonwealth of Australia (2001). "*Australia State of the Environment 2001 Report*", CSIRO Publishing on behalf of the Department of Environment and Heritage, Canberra. Internet reference <http://www.ea.gov.au/soe/2001/index.html> , 2001.

English, V. and Blyth, J. (1999). "Development and application of procedures to identify and conserve threatened ecological communities in the South-west Botanical Province of Western Australia", *Pacific Conservation Biology*, **5**: 124-138.

Environment Australia (EA) (2001a), "*A Directory of Important Wetlands*", 3rd Edition, Environment Australia, Canberra.

Environment Australia (EA) (2001b). National Objectives and Targets for Biodiversity Conservation 2001 - 2005. Canberra.

Environmental Protection Authority (2000). “*Environmental Protection of Native Vegetation in Western Australia*”, Position Statement No 2, Perth, Western Australia, December 2000.

Environmental Protection Authority (2001a). “*A policy framework for the establishment of wetland banking instruments in Western Australia*”, draft discussion paper, Perth, Western Australia.

Environmental Protection Authority (2001b). “*Environmental Protection of Wetlands*”, Preliminary Position Statement No 4, Perth, Western Australia, June 2001.

Environmental Protection Authority (2002a). “*Terrestrial Biological Surveys as an Element of Biodiversity Protection*”, Position Statement No 3, Perth, Western Australia, March 2002.

Environmental Protection Authority (2003a). “*Benthic Primary Producer Habitat Protection for Western Australia’s Marine Environment*”, Draft Guidance Statement No 29, Perth, Western Australia, August 2003.

Environmental Protection Authority (2003b). “*Implementing Best Practice in proposals submitted to the Environmental Impact Assessment Process*”, Guidance Statement No 55, Perth, Western Australia, December 2003.

Environment Victoria (2000). “*Submission to Victoria’s Draft Native Vegetation Framework and Draft Native Vegetation Management Plans*”, December 2000.

Gillespie, R. (2000). “*Economic Values of Native Vegetation of New South Wales*”. A background paper of the Native Vegetation Advisory Council of NSW, Background paper no 4, NVAC, Sydney.

Godden, D. and Vernon, D. (2003). “*Theoretical issues in using offsets for managing biodiversity*”, Australian Agricultural and Resource Economics Society Annual Conference Paper, February 2003, Fremantle.

Government of Western Australia (1998). “*Environmental Western Australia: State of the Environment Report*”, Department of Environmental Protection, Perth.

Government of Western Australia (2003a). “*Hope for the future: the Western Australian State Sustainability Strategy*”, Department of Premier and Cabinet, Perth.

Government of Western Australia (2003b). “*Western Australian Greenhouse Strategy: Consultation Draft 2003*”, Western Australian Greenhouse Task Force, Perth.

James, D. (1997). “*Environmental Incentives: Australian Experience with Economic Instruments for Environmental Management*”, Environmental Economics Research Paper No.5, Prepared for Environment Australia.

Johnson, P., Mock, D., McMillan, A., Driscoll, L. and Hruby, T. (2002). “*Washington State Wetland Mitigation Evaluation Study: Phase 2: Evaluating Success*”, Washington, Washington State Department of Ecology.

Murtough, G., Aretino, B. and Matysek, A. (2002) “*Creating Markets for Ecosystem Services*”; Productivity Commission Staff Research Paper. Canberra, Ausinfo.

Nature Conservation Council of NSW (2001). *NCC Submission on the “Offsets, Salinity and Native Vegetation Discussion Paper*, comments submitted to Department of Land and Water Conservation, NSW, Australia, Sept 2001.

New South Wales Environmental Protection Authority (NSW EPA) (2002). “*Green offsets for sustainable development*”, a concept paper, April 2002.

O’Sullivan, D. (2002). “*Creating markets for nutrients and other water pollutants*”, Coast to Coast 2002, conference paper, April 2003.

Robinson, J. and Ryan, S. (2002). “*A policy framework for implementation of economic instruments for environmental management*”, Coast to Coast 2002, conference paper, April 2003.

United Nations Environment Program (UNEP) (2002). “*Global Environmental Outlook*” 3, Internet reference <http://www.unep.org/geo/geo3/>, 2002.

United States Environmental Protection Agency (1990). Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404 (b)(1) Guidelines, February 6, 1990.

United States Environmental Protection Agency (2002). “*Clearing the Air: the facts about capping and trading emissions*”, Office of Air and Radiation, Clean Air Markets Division, May 2002. Internet reference: <http://www.epa.gov/airmarkets/articles/clearingtheair.pdf>

Van Bueren, M. (2001). “*Emerging markets for environmental services - Implications and opportunities for resource management in Australia*”, a report for Rural Industries Research and Development Corporation, Land and Water Australia, FWPRDC Joint Venture Agroforestry Program, RIRDC Publication No. 01/162, Canberra, November 2001.

World Resources Institute (2000). Presentation in: “*2000 Great Lakes Trading Network Conference*”. Internet reference: <http://www.envtn.org/docs/2000conf/wri.PDF>

APPENDIX 1

This summary of public submissions refers to the EPA document entitled “A policy framework for the establishment of wetland banking instruments in Western Australia: Draft for public comment” (June, 2001). In the past few years the wetland banking concept has evolved into the broader concept of environmental offsets. For this reason, the following summary focuses on conceptual comments that were received, rather than comments relating to the structure, style or specific wording of the public discussion document.

General Theme	Specific issue / comment	Main points (2 or more similar responses)
Overall approach	<ul style="list-style-type: none"> • Support the wetland banking approach being taken (7 responses) • Some general concerns with wetland banking concepts – eg. open to abuse or failure, need to improve content. (3 responses) • Local examples have been provided that illustrate that past attempts at wetland mitigation (including land purchases and rezoning activities) have failed. (3 responses) • Availability of wetland banking should not weaken the criteria for allowing impacts to wetlands (eg. EIA). (2 responses) • Need to ensure consistency with other environmental policies, guidelines and values. (1 response) • Wetland banking is a complex issue (1 response) • Discussion paper is a mix of wetland mitigation and wetland banking concepts. (1 response) • Other factors need to be considered alongside wetland banking (eg. bushland protection, pollution, water protection, etc) (1 response) 	<ul style="list-style-type: none"> • General support for wetland banking concept. • Some concerns with concept being open to abuse. • Some local examples indicate that past attempts at wetland mitigation have not been successful. • Wetland banking should not weaken existing criteria for allowing impacts.
Wetlands definition	<ul style="list-style-type: none"> • Wetland definition used in the paper is too narrow (doesn't include groundwater or fringing vegetation and buffers) (2 responses) 	<ul style="list-style-type: none"> • Definition of wetlands should include hydrological processes and dependent vegetation.
No net loss / Net gain concept	<ul style="list-style-type: none"> • ‘No net loss’ or ‘net gain’ concept supported (3 responses) • ‘No net loss’ concept not realistic. (1 response) 	<ul style="list-style-type: none"> • ‘No net loss’ or ‘net gain’ concept generally supported.
Mitigation sequence	<ul style="list-style-type: none"> • Mitigation sequence supported. (5 responses) • Support of the proposal to ensure the wetland mitigation occurs prior to the impact. (3 responses) • Mitigation measures should be considered a priority where links to good condition native vegetation, especially large areas, can be linked with other protected wetlands. (1 response) 	<ul style="list-style-type: none"> • General support for the mitigation sequence. • General support for wetland banking / mitigation delivering a positive outcome prior to the impact occurring.
‘Wise use of wetlands’	<ul style="list-style-type: none"> • ‘Wise use’ concept needs to be recognized that wetlands have intrinsic value in addition to beneficial human uses. (1 response) • ‘Wise use’ concept is open to interpretation – many of which are environmentally unacceptable. (1 response) 	<ul style="list-style-type: none"> • Lack of clarity for ‘wise use of wetlands’ concept.

Wetland Banking Policy	<ul style="list-style-type: none"> • Wetland banking requires criteria / rules / principles / procedures / regulations to be established (3 responses) • Impacted and mitigated wetlands should be ‘like for like’, ensuring quality and / or quantity aspects / values / wetland types are preserved. (2 responses) • Wetland banks should not be used for alternative site design or site selection. (1 response) • Clear policy statements are required by EPA to remove doubt about the position and future commitment of wetland conservation / mitigation. (1 response) • EPA will need to enforce breaches to wetland banking rules. (1 response) • Wetland credits must be protected in the long term / in perpetuity. (1 response) • Promises for future mitigation (post-impact) should be avoided. (1 response) • Government agencies should not be exempt from wetland banking requirements (1 response) 	<ul style="list-style-type: none"> • General support that wetland banking requires robust policy, principles and regulations to ensure positive environmental outcomes. • General support that mitigated wetlands should retain characteristics of the impacted wetland – ensuring ‘like for like’. • Some general support to enforce and ensure a positive environmental outcome in the long term.
Administering credits / debits	<ul style="list-style-type: none"> • Must have a rigorous assessment process for ‘measure of worth or value’ of wetlands to generate credits. (2 responses) • Not clear if DRFs and TECs influence credit / debit allocation. (1 response) • Concern about the practicality of administering credits. (1 response) • Concern that low value wetlands may be used as credits to meet mitigation requirements. (1 response) • Credits should not be given for lands purchased by government agencies. (1 response) 	<ul style="list-style-type: none"> • Robust assessment processes are required to measure value or worth of wetlands.
Bank management	<ul style="list-style-type: none"> • Wetland banks should be administered by the EPA. (2 responses) • Concern with concept of private wetland banks (2 responses) • Must ensure that the body administering a bank must remain entirely neutral. (1 response) • Adequate resources must be provided to ensure on-going activities, such as monitoring, administration, evaluation, assessments, maintenance and enforcement of wetland banking activities. (1 response) • Wetland banking framework must be rigorous, transparent and auditable. (1 response) • No clear outline provided as to who administers / manages the wetland bank. (1 response) • Wetland banks should not be administered by the EPA (1 response) • Wetland banks should be administered by the DEP (1 response) • Wetland banks should be administered by CALM (1 response) • Wetland banks should not be administered by CALM (1 response) • Local government does not have resources or expertise to manage a wetland bank (1 response) 	<ul style="list-style-type: none"> • Lack of consensus as to who would be best to administer a wetland bank, however the EPA was given slight preference. • Private wetland banks would need to be tightly regulated to ensure their success.

Evaluation	<ul style="list-style-type: none"> • Not clear how wetland restoration, rehabilitation or creation projects will be assessed (1 response) • Ecological viability of created wetlands need to be considered when assessing success of mitigation activities. (1 response) • Wetland mitigation occurring prior to impact will ensure that Ministerial Conditions and other legislative requirements can be met. (1 response) • Wetland mitigation key performance indicators need to be developed to properly assess mitigation activities. (1 response) 	<ul style="list-style-type: none"> • Lack of direction as how to evaluate wetland mitigation / banking.
Wetland conservation	<ul style="list-style-type: none"> • Conservation of wetlands is foremost priority or ensuring that impacts to wetlands are a last resort. (4 responses) • Some wetlands (eg. Conservation Category Wetlands) should be protected at all costs. (3 responses) • Purchased wetlands for conservation should be added into the conservation estate and MRS amended. (1 response) 	<ul style="list-style-type: none"> • Avoidance of impacts to wetlands is a top priority, with high value wetlands (eg. CCW and Ramsar) representing ‘critical assets’.
Wetland creation	<ul style="list-style-type: none"> • Wetlands creation is a complex issue when considering an ecological system. (3 responses) • Creation needs to recreate (where possible) biodiversity, habitat and hydrology of impacted wetland. (2 responses) • Wetland creation needs to consider surrounding landuses and opportunities for forming biodiversity corridors (2 responses) 	<ul style="list-style-type: none"> • Wetlands creation is a complex issue when considering all ecological requirements that need to be addressed / fulfilled.
Wetland enhancement	<ul style="list-style-type: none"> • Wetland enhancement activities must be ecologically based. (1 response) 	
Wetland values and functions	<ul style="list-style-type: none"> • All wetland values and functions that are to be mitigated must be clearly defined. (2 responses) • Support the notion that the EPAs determinations will adapt if wetland loss continues or if current knowledge improves. (1 response) • Overall effect of wetland banking activities should not diminish level of connectivity between existing wetlands. (1 response) 	<ul style="list-style-type: none"> • All wetland values and functions need to be assessed and clearly defined prior to impact and developing mitigation activities.
Stakeholder involvement	<ul style="list-style-type: none"> • Stakeholder seeks further involvement on the matter. (2 responses) • Circulation of discussion paper should also be extended to non-peak environmental / wetland groups. (1 response) 	
Transparency / Accountability	<ul style="list-style-type: none"> • Proponents should report their mitigation activities (monitoring, assessments, evaluation, progress towards achieving objectives, etc) to the public. (2 responses) • Established protocols for monitoring, reporting and auditing are essential. (1 response) 	<ul style="list-style-type: none"> • Need to ensure that all information associated with wetland banking / mitigation should be publicly available.